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COOPERATION

WP 4: Stakeholder Interviews
Integrated European Report

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by

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1. Introduction

This report (D20) summarizes the results from the qualitative stakeholder interviews conducted in the context of work package 4 (WP4) of the BARENERGY project. In this work package, we asked stakeholders what they perceived to be the barriers for consumers in relation to the adoption of energy efficient behavior, what attempts had been made to overcome those barriers, and also what could be done in the future. The report mainly centers upon the outcomes of the interviews, building upon a more extensive literature review which was conducted in the previous work package (WP3). A quantitative consumer survey as part of WP5 will constitute the next part of the empirical work.

Interviews were conducted between November and December 2008 in the six participating countries: France (FR), Great Britain (UK), Hungary (HU), the Netherlands (NL), Norway (NO), and Switzerland (CH) and across three areas: 87 interviews in the area of domestic energy use, 23 interviews in the area of household appliances, and 52 in the area of private mobility. Most of the interviews were carried out in 30-60 minute long face-to-face interviews; in a few cases, interviews were conducted over the phone. All of the interviews were recorded.

The interviewed stakeholders included political authorities (national and municipal level); semi-public institutions; appliance and car industry interest groups; appliance and car manufacturers; educational institutions; and NGOs. The stakeholders interviewed came from various sectors, and to maintain the anonymity of their answers, we will only refer to their specific backgrounds at the beginning of the different sections, rather than after each interviewee's specific statements. Stakeholders from households were not interviewed in this phase of the project since they will be the target group in the subsequent quantitative survey.

Consumption is a multi-phase process: from planning and buying to use and recycling. In this part of the research program, we concentrate on the purchase and use phases. It is important to consider the consumption process beyond the choices of energy carriers; purchase of houses; domestic appliances and decisions on energy carriers in cars, to also include the use phase. In general the environmental impact of consumption is more related to the use phase than the purchase phase. This is definitely the case for energy consumption. For instance, it is possible to buy eco-labeled products and use them in a way that increases the environmental impact, or to change to renewable energy resources without reducing the environmental impact because of energy inefficient behavior. Reduction of energy use, purchase of energy efficient appliances, and replacement of fossil fuels with sustainable energy sources are three different dimensions which should be taken into consideration when studying barriers for energy changes among end consumers and households.

Based on the EU Green paper on energy efficiency ("Doing more with less" (COM (2005) 265 final of 22 June, 2005) BARENERGY concentrates on the three domestic energy topics: energy use, appliances and mobility.

In each of these areas and phases, we look at the barriers to different specific actions which all in all, in our point of view give a representative picture of energy consumption.

In the purchase phase, we studied barriers in the following fields:

- Domestic energy use
  - Change to renewable energy resources: "installation of photovoltaic panels", "purchase of green power"
  - Heating of residences: "construction of energy efficient houses", "energy efficient refurbishment",
- Household appliances
  - Purchase of domestic appliances: "purchase of refrigerators and cooking pans"
- Household mobility
  - Purchase of car: "hybrids", "fuel efficient vehicles"

Regarding the use phase, the following fields were analyzed:

- Domestic energy use:
  - "heating behavior"
- Household appliances:
  - "cooking behavior"
- Household mobility:
  - "public transport"
  - "walking or biking for short distance trips"
  - "car sharing"

The use phase encompasses daily routine behavior managing the household, the purchase phase concerns behavior regarding (large) investments in material goods. Independent of the areas Energy Use, Appliances and Mobility, almost all the same barriers were identified in these two phases. As a result, we look at the barriers, past attempts, and future possibilities in the purchase phase in the first chapter, and analyze the use phase in the second chapter. In each chapter, we first discuss the specific barriers, past attempts, and possibilities for the future in the different fields, and finally come up with some general conclusion regarding each phase at the end of the chapter.

The different area-specific barriers can be classified into the six types of barriers to household energy savings suggested by Throne-Holst, Strandbakken and Sto (2008)[1]. As mentioned above, the barriers identified are from the consumer perspective.

- **Physical and Structural Barriers:** The physical structure of society can sometimes limit households' desires to change behavior to more sustainable ways. For example, people lacking a thermostat in their apartment are not able to regulate room temperature.
- **Political Barriers:** The laws and regulations developed by politicians at local, national, and European levels create frameworks for general household behaviors. Political authorities at various levels are also responsible for the implementation of these laws and regulations, and are thus a determining factor in individual households' ability to change behavior.
- **Cultural-Normative Barriers:** Specific cultural norms may inhibit many people from engaging in more energy efficient behaviors. While some actions are considered "uncultured" (like riding bicycles in Hungary, for example), other decisions can be viewed as aesthetically unpleasant. For example, photovoltaic panels are sometimes considered to spoil the image of a home, or even the view.
- **Economic Barriers:** Energy efficient behavior can come at a cost, especially when it comes to the purchase of items that are more energy efficient. These high prices may keep people from making the change towards becoming more efficient in their energy use.
- **Information Barriers:** Many households lack information about energy efficient behaviors or products, or do not know how or where to find the relevant information.
- **Individual-Psychological Barriers:** Individual willingness to make changes can be a very large barrier, especially for changes that would alter an individual's personal habits and comfort zones. This is one of the most difficult barriers to overcome.

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[1] Throne-Holst, Strandbakken and Sto (2007): Identification of households' barriers to energy saving solutions, Management of Environmental Quality, Vol. 19 No.1, 54-66.

2. Purchase Phase

In the following section we look at the most important specific barriers; past attempts to overcome them; and possibilities for future actions in different energy fields. We also discuss the differences which can be discerned among the six countries. We start with the area of photovoltaics, followed by the purchase of green power. In the third section, we present the results regarding housing; including the construction of energy efficient houses and energy efficient refurbishment. We then go on to look at the purchase of refrigerators and cooking pans. Finally, in the context of household mobility, we present the results in the field of energy efficient cars and hybrids.

2.1 Photovoltaic Panels

In this first section, we present the results of the interviews in the field of photovoltaics. This was an area of energy use which was discussed in all of the countries except Norway.

2.1.1 Main Barriers to Change

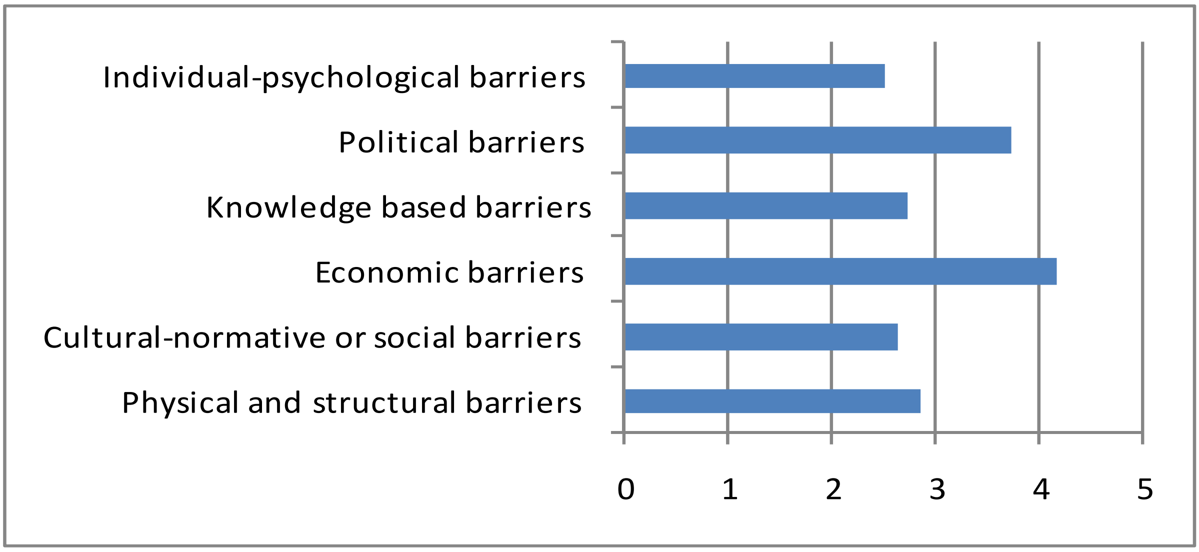

Fig. 1: Average of respondents' ratings of barrier categories for the construction of photovoltaic panels (from 0=no perceived barrier to 5=very important barrier).

Overall, economic barriers were the most highly rated barriers in all participant countries. Issues here included high initial investment and costs per kWh. High initial investment was seen in all countries except Switzerland as the most important barrier.

Some political, cultural and information barriers were also rated highly by stakeholders in certain countries. Most of the CH respondents and UK respondents from the political level perceived insufficient governmental support as a very important barrier. The CH stakeholders criticized the feed-in tariff that was introduced at the beginning of 2009. There were many willing applicants to partake in this scheme, but because of tariff is tightly capped, only very few were accepted. Some UK stakeholders mentioned the lack of a feed-in tariff for photovoltaic as the most notable omission. Another slightly less important political barrier was felt to be the lack of consistency in the policy framework, except for in NL. Here the interviewed stakeholders perceived the unreliability of governmental subsidies as very important. Another political barrier was perceived to be the complicated administrative procedure to get construction permits. Respondents from UK and HU mentioned that this was quite an important problem, whereas in the other countries - with the exception of protected buildings - this was not so important.

The highest rated cultural barrier was related to the lack of interest of architects and installers. This would seem to be significant as they are central stakeholders in the decision making process of homeowners. The perceived lack of knowledge of these professionals was also seen as a barrier, although not as important. Furthermore, a couple of stakeholders mentioned that the technology was not yet taken seriously by consumers and industry as a means of supplying a household's energy needs. Most of them like the idea of photovoltaics, but think the technology is not yet compatible with what is happening. This goes together with the lack of 'role models' mentioned by a couple of CH respondents. There are only few photovoltaic systems in CH and solar panels are thus far from being a standard.

Information barriers were also perceived as important, especially in UK and HU, where stakeholders saw an important lack of knowledge amongst homeowners. FR respondents however did not view this is a barrier.

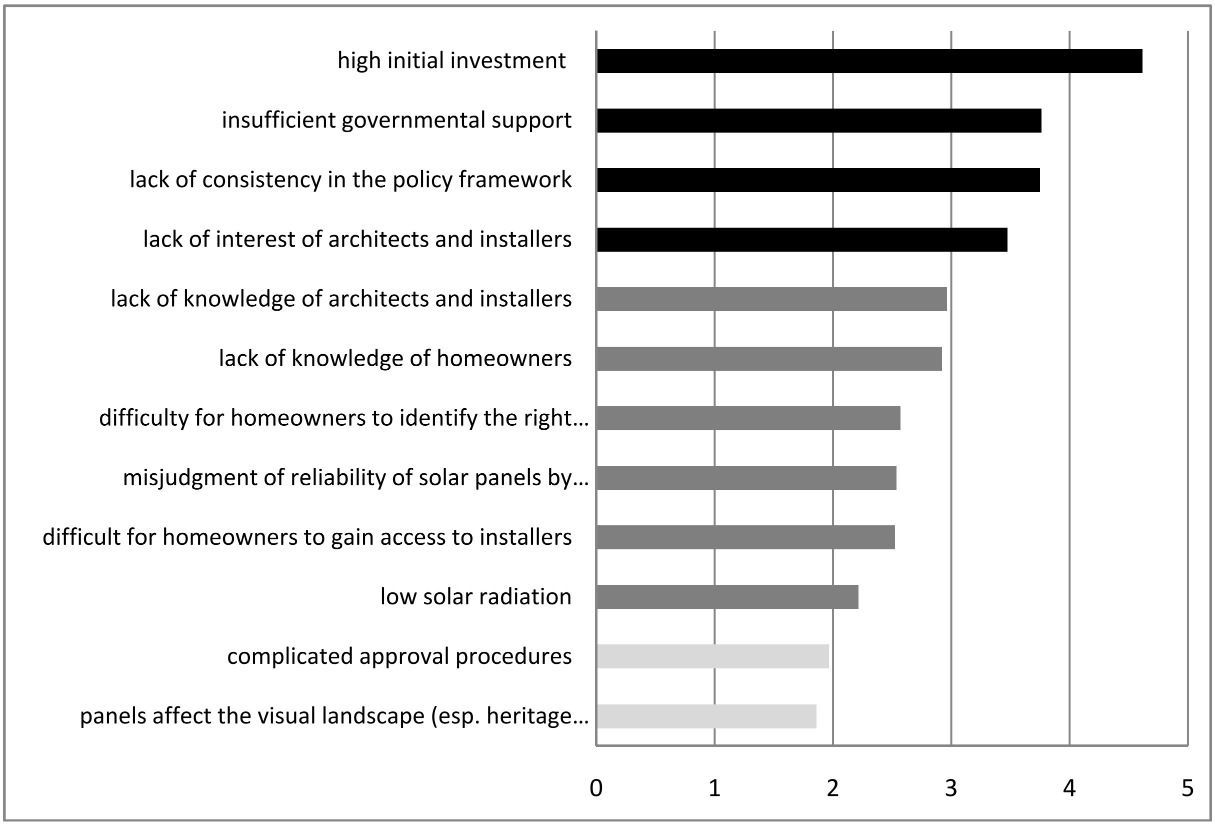

Fig. 2: Average of respondents' ratings of barriers to the construction of photovoltaic panels (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

2.1.2 Relevant Past Attempts

There have been multiple **subsidies** for the installation of photovoltaic panels in the past in most of the countries under study (NL, CH, HU, and UK). The main problem regarding subsidies was said to be a lack of continuity because they are currently determined yearly based on political decisions. In the NL, the limited amount of subsidies have always been used up quickly. As a result, demand invariably collapses until the next subsidy comes around. This makes the market very unreliable for installers to invest in. In UK, the demand has remained low so political action remains ambivalent at present. In CH, subsidies were neither comprehensive (on regional level) nor continuous, and consequently they have hardly been used.

In FR, instead of grants, there is a **40% revenue tax reduction** for buyers of photovoltaic panels. However this currently only concerns a certain category of the population – the most affluent – and does not in any way encourage domestic customers on the whole to invest in panels.

Feed-in tariffs were generally considered to be an effective policy instrument for encouraging more widespread use of photovoltaics. In all countries except for UK, a feed-in tariff has been introduced. In FR, the feed-in tariff has recently been doubled (from €0.11 to €0.22/kWh), and is especially attractive for integrated installation buildings. In CH, the feed-in tariff introduced as of January 2009 is subject to a tight cap, and consequently, it was felt that only very few homeowners could benefit from this support. As a result, it was generally felt that discussion on the role of the feed-in tariff has shifted from positive to negative.

2.1.3 Recommendations for Future Actions and Main Stakeholders

Generally it was felt that photovoltaics are not yet self-sustaining, and are still dependent on policy and regulation. As a result, the **government** was identified as the key stakeholder regarding the installation of photovoltaics (NL, UK, CH, and HU). UK stakeholders for instance, felt that the government had a role to play in encouraging both businesses and consumers to 'think outside the box' regarding conventional energy use. A UK respondent also mentioned that consumers expected the government to support photovoltaics in a more substantial way than at present. It was felt in particular, that the government should introduce a non-capped feed-in tariff, which would be financed through the energy consumers (CH, NE, UK) with the energy-grid provider responsible for the transactions. In this way, it was argued that it would not become a government budget issue (which is still the case in NL); making it easier to achieve long-term commitment. This kind of governmental support would then be more likely to promote greater availability of photovoltaics (economy of scale).

To further overcome economic barriers, some stakeholders from UK and CH also mentioned that their government should provide more support for photovoltaic technology research and design to improve efficiency and maybe the design aesthetics.

Besides the need for an effective political framework, many respondents mentioned the need for enough specialists and greater expertise in order to guarantee quality. In CH, stakeholders thought that information regarding **professionals** (architects, installers, craftsmen, etc.) was the most important aspect, as these constituted the key stakeholders. Here it was felt that a lot needed to be done regarding training and further education. UK and FR also mentioned this issue. In order to overcome what was felt to be a 'lack of will' on the part of many architects, it was pointed out that famous architects could perhaps act as role models if they began using photovoltaics more centrally in their designs. It was felt that this could have a great impact on education regarding both the benefits and uses of photovoltaics.

Energy suppliers were further identified as an important stakeholder (UK, FR, CH). It was felt that their influence lay in offering solar power either purchased from homeowners or produced by their own installations.

Two of the CH respondents thought that **market structures** needed to be improved. It was felt that photovoltaic companies could pursue more professional sales and marketing activities.

Regarding awareness raising, information, and education amongst consumers, UK stakeholders felt that the government should incorporate the views of **NGOs** more fully into their decision making in order to help create the political space needed to overcome the societal and political barriers identified above. Also FR and HU stakeholders insisted on the necessity and more widespread dissemination of general information and explanations regarding the benefits of photovoltaics. They also mentioned the educational role of the **media** and especially television which needed to be more at the forefront of this effort. A proposition made by FR **installers** in France has been to increase the duration of photovoltaic panel warranties in order to restore the confidence of potential buyers.

2.2 Green Power

Besides investing in solar panels, consumers can also purchase green power from their utility provider. In this section, we analyze the barriers, past attempts to overcome barriers, and recommendations in the field of green power.
Interviews about the purchase of domestic appliances were done in UK, HU, FR, CH.
HU is not included in the survey, because there it is not possible to choose a power product.

2.2.1 Main Barriers to Change

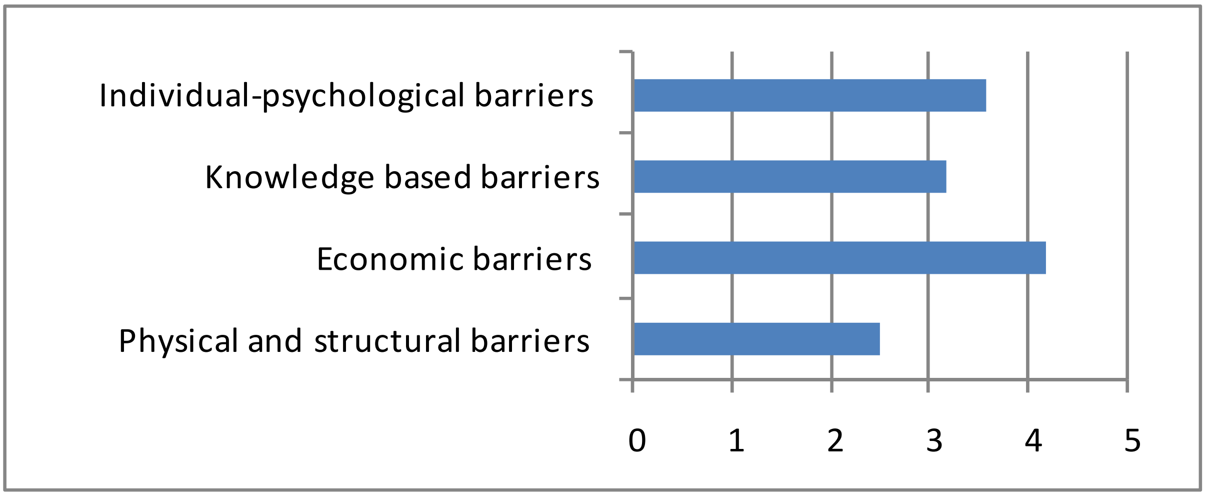

Fig. 3: Average of respondents' ratings of barrier categories for the construction of photovoltaic panels (from 0=no perceived barrier to 5=very important barrier).

Overall, the higher price of green power was seen as the most important barrier to widespread take-up. However, some interviewees in CH, NL and UK perceived other, mostly individual-psychological, barriers as more important because the price difference is often fairly minimal. Some interviewees mentioned that consumers often overestimate the price difference. A lack of trust in power companies' statements was perceived to be an important barrier in FR, NL, and CH. CH. In these countries, stakeholders argued that lack of trust is a problem because the added value of green power (power plants, certification process, etc) is often not communicated enough and thus people do not have an understanding what the what the effect of their green power purchase would be. For example, it was felt that electric utilities selling hydropower as green power needed to communicate the quality of green hydropower (better use of the residual water, fish ladders, etc) in contrast to conventional hydropower. Without this information, it was argued that consumers might not see the difference between green hydropower and conventional hydropower from pumped-storage hydro plants and that they would not understand why they should pay more for the green hydropower when a large portion of the CH production mix already consisted of hydropower.

In CH and also in NL, ineffective marketing strategies were perceived to be important barriers to more widespread uptake of green energy. In UK, HU and FR however, this barrier seemed to be not quite so relevant. In HU this is because there is no possibility as a consumer to choose a power product. Another problem, rated highest in NL, was that the consumers do not always understand the concept of green power marketing.

One NL respondent argued that consumers sometimes are not motivated to buy green power because there is only a small amount of national green power production. Further to this, many respondents suggested that the default power mix rarely contains green power as a very important barrier. As there is no need to make a conscious decision before turning the electricity on, and because power is abstract, people do not deal with electricity as a product. They therefore usually use the kind of electricity that is offered as the default without thinking about it further.

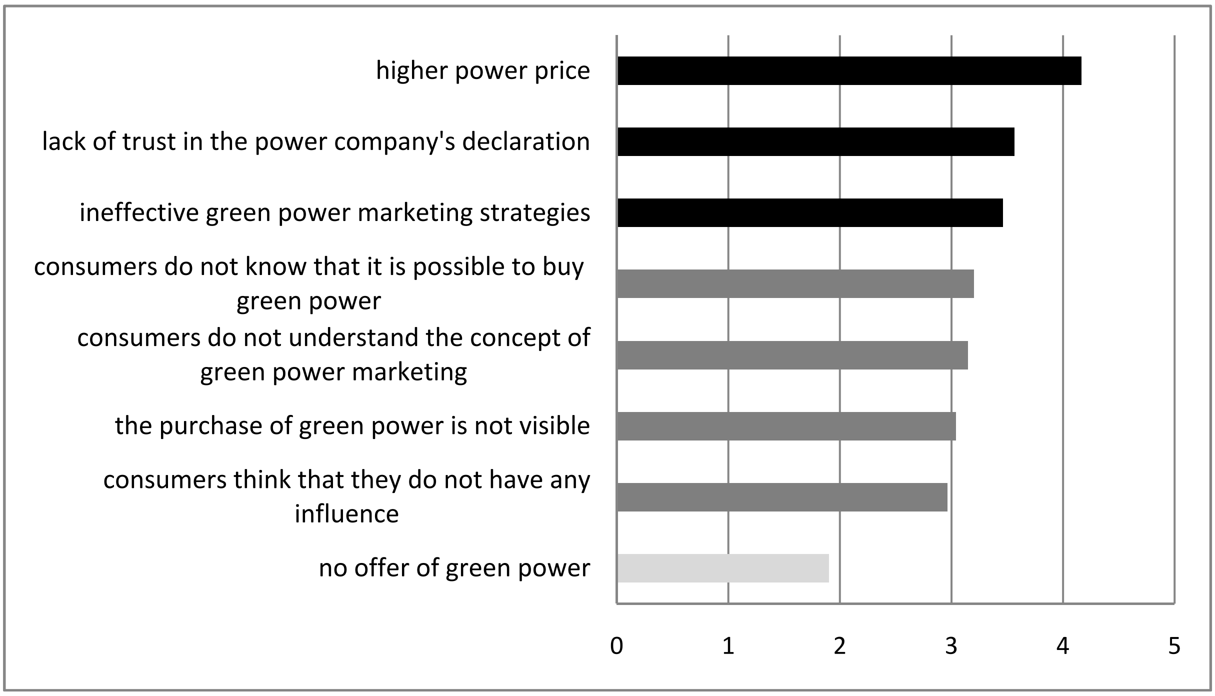

Fig. 4: Average of respondents' ratings of barriers to the purchase of green power (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

2.2.1 Relevant Past Attempts

In most countries, green power marketing is the power providers' responsibility, rather than the governments. There have thus been a couple of past attempts from various utilities to increase sales of green power. In CH, a very successful measure to increase the amount of green power was to offer a **default product with a power mix including green power**. Customers, who preferred the less ecological power mix, would then have to make an active switch. In many countries, power providers have initiated **different marketing campaigns** around green power (NL, CH, UK, and FR). In CH, the most used medium is a ‘bill insert’. It was felt that this measure had been quite successful in introducing the benefits of green energy. It was also felt however that, in order to introduce a significant increase in the share of green power, it would not sufficient in itself.

To overcome information barriers, there have also been attempts from stakeholders other than the energy suppliers. In UK for instance, the government led informational campaigns for the benefit of consumers and energy users. In CH, there have been two relevant attempts. Since 2006, for instance, there has been a **regulation** mandating that the yearly electricity bill sent to consumers should include a declaration of origin (electricity source and whether it is produced domestically or abroad). It was felt that the transparency that this created was an important first step, but ultimately not enough, to inform consumers on a wider scale since many did not even look at the declaration. As a consequence, the declaration requirement did not have the desired effect of provoking wider discussion and changing behavior. Secondly, the introduction of the **naturemade labeling system** set quality criteria control, thus contributing to the clarity and credibility of green power, assuring the creation of an additional ecological value by building up green energy capacities.

In regard to economic barriers, in the past NL power providers guaranteed green power consumers that the **price for green power** would never be more than that of traditional power (some still do). It was perceived to be a success until the rumor started that to be able to meet the demand, non-green power (like nuclear) was used. It was argued that this resulted in a breach of consumer trust. Therefore it was argued that before this guaranteed price, the higher price constituted a barrier which then gave way to the breach of trust as a newer barrier.

2.2.2 Recommendations for Future Actions and Main Stakeholders

In NL and CH, respondents perceived the power utilities as constituting the main stakeholders, whereas the other countries' interviewees thought that the government should play a greater role. It was felt that the **government** should provide the right framework conditions through regulations and financial support. It was argued that this can also creates the boundaries within which power producers and providers can act within a framework of greater competition. In this context, FR stakeholders mentioned that fair competition between the different suppliers was important.

It was argued that **power utilities** had a major role to play in informing their customers; marketing green power products; and also in creating their power mix (especially by determining their default product). It was suggested that marketing efforts should be more innovative and needed to focus on target groups instead of treating customers as one homogenous group. Measures suggested by the respondents included:

- to present green power as cool and fashionable, e.g. image campaigns with famous people like Roger Federer or sponsoring special events such as open-air concert festivals;
- communicating the number and percentages of green power users;
- to stimulate the 'neighbor effect' (i.e. recommendations by neighbors, family and friends);
- to get the concept of green power as close to the customer as possible, i.e. green power needed to be made visible for example by giving green power customers green electrical outlet covers or even just stickers for light switches;
- to provide combination offers, e.g. with the purchase of a refrigerator, the customer would also get a certain amount of green power or with the purchase of a bicycle the customer could get one year of green power for free.

On the subject of the power mix composition, it was argued that green power should be the default and people who prefer conventional power would than need to switch.
Regarding information, **producers** are important as well since they should provide transparent information about the origin of green power (NL). It should be clear for the consumers where, how and by whom green power is produced. Therefore, in some countries, the introduction of a new label for different types of power (NL) or improving the current power label (UK) is suggested. In UK, several stakeholders felt the **public regulator** for the now privatized gas and electricity markets (Ofgem) had an important role to play in ensuring consumers received transparent information on tariffs from all suppliers that offer them. Ofgem's role would become more significant if the government introduced an accreditation scheme whereby customers would be more informed on a company's green credentials and where their energy was sourced from.

It was felt that **NGOs, the media and environmental lobby groups** had a role to play in supporting green power (UK, NL) because of their position as translators between the producers and consumers. One NL respondent thought that their often (at least perceived) less subjective identity is well positioned to inform consumers about green power and also to demand clear definitions and specifications from producers. In NL, it has been shown that a coalition of different NGOs and commercial companies is a strong ambassador for behavioral change because they are seen as parties with different interests that have been able to come to an agreement on which information is correct.

HU, FR and UK interviewees perceive the **financial aspects** as very important. They suggest using green taxation measures to encourage people to purchase green power. Raising taxes on non-renewable power production could make switching to green power more attractive for consumers as companies would potentially be able to charge less.
Further, **villages** (HU), **municipal utilities, and companies** (CH) are mentioned as important stakeholders because here, decisions of few persons can have a big effect. They could plan and carry out specific projects on the local level.
Last but not least, **consumers** play an important role since they can switch from regular to green power given the right conditions (UK, NL, CH, FR).

2.3 Construction of Low Energy Houses

In the analyzed countries, housing stocks are at very different stages regarding energy efficiency. In CH, 14% to 20% of the new constructions follow the requirements of the MINERGIE label (considering all types of constructions), whereas in FR the low energy house label has just been introduced. This is also the case in Norway where all new building and large refurbishments projects will be labeled. UK does not have any PassivHaus dwellings, but there are several examples of low energy or zero carbon homes. In all these countries, the construction industry has yet to embrace the necessary changes in building practice and design required to achieve wide scale deployment.
To transform the housing market, improving energy efficiency in new buildings is one part. The other and significantly more difficult part is dealing with existing buildings and housing stock. A significant portion of energy is consumed by existing buildings, due to the long time frame that buildings are in use. For a long time the subject of refurbishment has been neglected. As a result, refurbishment and improvement of existing buildings is badly needed right now in order to meet environment and energy efficiency goals. In what follows, first the results of the survey regarding the new construction of low energy houses are summarized; secondly, we will look at energy efficient refurbishment.
Interviews about the construction of low energy houses were done in all countries.

2.3.1 Main Barriers to Change

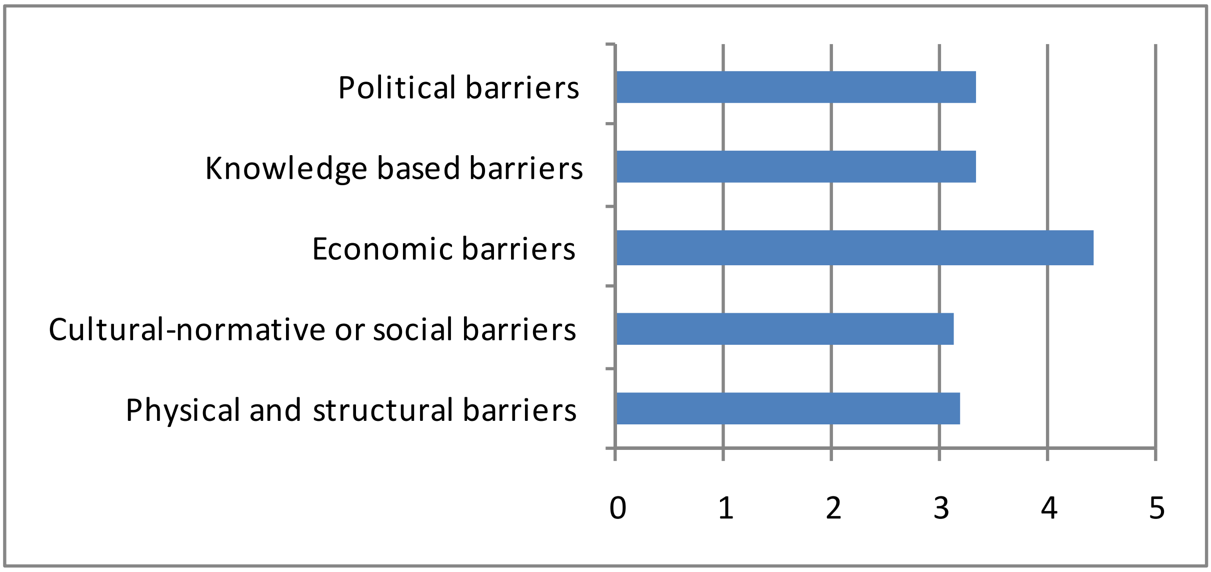

Fig. 5: Average of respondents' ratings of barrier categories for the construction of photovoltaic panels (from 0=no perceived barrier to 5=very important barrier).

Regarding the construction of new houses, all the interviewed stakeholders mentioned that the economic barriers are either the most important or are the second most important barriers. The main reason for costs being a barrier is that initial investment costs are high. When a house is being constructed, the owner already has many expenses, so additional investments in energy efficiency are not always seen as a priority. .

In all countries except NO and UK, there are however other barriers of higher importance or similarly highest rated. CH respondents mentioned explicitly that they did not see financial constraints as the biggest issue anymore. The will of architects and cost transparency were thought to be more important. The latter was also perceived as very important by the NL interviewees. In NL, the political barrier of a lack of consistency in the policy framework was also perceived to be highly relevant. In HU, the difficulty to identify artisans was rated highest. Also, respondents perceived the lack of knowledge and interest of homeowners and architects was more important than the costs. The reason for this is that there are few examples of and little experience with passive houses. Interviewed stakeholders had little idea about the costs. If there were good professionals (artisans) and the demand rose, costs would become the most important barrier. But as there is no knowledge – according to the respondents – and no examples of passive houses, costs issues were not relevant yet.

The cultural-normative barrier “lack of interest of architects” was perceived to be the main barrier by NO, CH, HU and FR respondents. It was suggested that architects often aimed to make a name for themselves instead of being a normal provider of services. Also, artistic aspects were often more important than more practical aspects such as energy efficiency. A NO interviewee expressed that architects were often supposed to make the cheapest plans possible. In UK however, architects were seen as being stakeholders of little importance - the stakeholders responsible for building houses are large building companies.

Another problem mentioned by some respondents of all countries was the lack of knowledge of relevant professionals. In FR and UK, interviewees noted their late arrival in the field as the main reason for this.

Political barriers were perceived to be important by HU, FR and UK respondents. In HU, interviewees thought that there was not enough governmental support in terms of information and money. In FR, a large number of approvals are required for the national technical and scientific building center (CSTB). In UK, there is a lack of comprehensible building regulations and standards, and they are not routinely enforced.

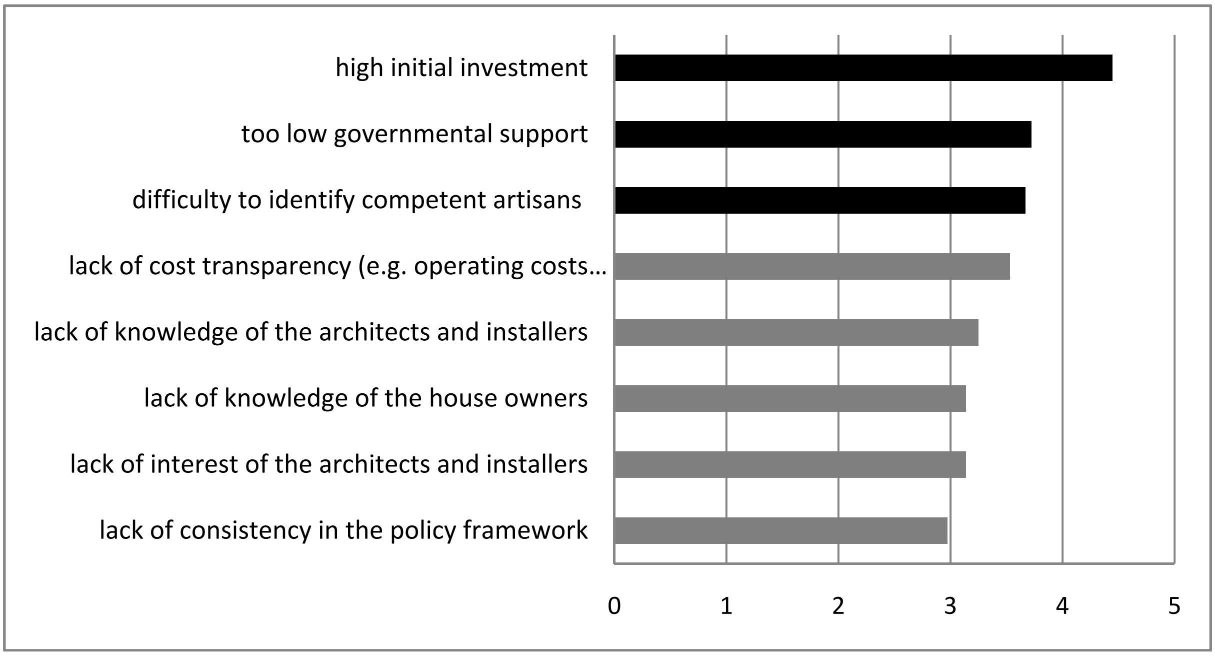

Fig. 6: Average of respondents' ratings of barriers to the construction of low-energy houses (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

2.3.2 Relevant Past Attempts

Many countries (CH, NL) used and still do use **subsidies** to encourage energy efficient housing construction. In NL, subsidies for energy-saving measures such as insulation material, etc. were widely used by consumers and producers, but they did lead to a rapid increase in sales of energy-saving measures. Subsidies have been cut back now, but the ones that are still in place work were thought to work well. In FR, there are currently no subsidies, but take the form of **tax incentives** from the government. These are however deemed insufficient and above all, have often been diverted from their original purpose by firms who use them as an excuse to increase their prices. I Norway ENOVA SF cover 20% of the costs for installing heat pumps in houses and other measures to improve energy efficiency. This was a result of the substantial increase in electricity in Norway in 2003.

Many countries have put in place some **voluntary labeling system** (CH, FR, UK, NO). In CH, the MINERGIE concept is a voluntary standard has had a large impact in overcoming barriers to low-energy housing. It defines how a building should be built in terms of energy efficiency and how much energy it can consume. Additionally, the MINERGIE standard requires that a comfort ventilation system is installed. In addition to the MINERGIE standard there is also MINERGIE-P (comparable to the passive house standard) and MINERGIE Eco. The spread of the MINERGIE standard has been aided by the fact that the concept has been clearly defined, and that the brand is trademark protected. Thanks to an effective marketing approach, including a widespread recognition by the government, artisans, and banks, the MINERGIE concept is known to a large part of the population. In FR, the Low Consumption Building Standard (Effinergie-BBC 2005) was recently created. It is voluntary until 2012. In UK, the introduction of the Standard Assessment Procedure in 2002 is now a compulsory feature of all new build homes where they are assessed on their energy efficiency performance. All new homes are required to hold a SAP certificate. A NO respondent mentioned the failure of the NVE (Norwegian Water Resources and Energy Directorate) to come up with an energy label for buildings, parallel to the energy labeling of household appliances.

The implementation of the **Energy Performance of Buildings Directive** has resulted in the development of home energy labels, known as Energy Performance Certificates (EPCs) in all countries. In NL (1996), UK (2007), NO (2008), HU (2009), FR, the EPC label is now obligatory for new homes and on buying and selling transactions and is considered to be of high value by many of the respondents. In NL, EPC (introduced in 1996) was received very positively. Thereby, the long-term vision of the government for EPC improvement was made clear and commercial organizations could plan to meet these standards. This resulted in more energy-efficient buildings being built before the rate was officially set. In UK, the advent of EPCs is perceived as an important – and long overdue – policy by the stakeholders who were interviewed on this. CH will be starting a voluntary test phase in August 2009 (cf. http://www.geak.ch/). Afterwards, the cantons will decide if they want to adopt the Energy Performance Certificates and if they decide in favour, which buildings to include (size, type, etc.). The interviewees had differing opinions regarding whether or not building energy certificates should be required by law. Most of the interviewees shared the view that the certificates should be mandatory, otherwise no one would pay attention to them and it would take too long for them to become established in the market. However, representatives of homeowners feared that a mandatory certificate would cost homeowners billions. They were afraid that all those whose homes have lower energy efficiency ratings would be downgraded and their homes would lose value. There then remained the possibility that the banks could possibly send out letters demanding part of their mortgages back.

Countries could decide individually on how to implement the Directive. The UK EPC, for example, mirrored the EU Energy Label for lights and appliances: it has categories A-G, colored green to red. The label uses the Standard Assessment Procedure (SAP), and reflected the energy costs of providing space, water heating, and fixed lighting. In addition to the label, the full EPC report contains information on estimated energy costs, details on how the labels were calculated, a summary of the energy performance of elements of the property (e.g. walls, roofs, windows), details on the costs and energy savings related to potential improvement measures, and suggestions of ‘further’ measures which had not been included within the calculation of the energy efficiency / environmental impact rating potential.

Norms with regard to minimum energy-efficiency of each newly-built house are becoming increasingly strict in all countries. These norms work often worked well but respondents pointed out that they needed to become stricter to really make a difference.

To help overcome the high initial investment, there are **low or zero interest mortgages** offered by banks (NL, CH, and FR). In NL, the Triosbank initiated the Green Investment Arrangement for New Construction (groen regeling nieuwbouw). Consumers can invest in a green fund, receiving a tax reduction on the first € 54.226. From this fund, green projects could borrow money with favorable interest rates. The National Mortgage Guarantee Fund (Nationale Hypotheek Garantie) gives people the opportunity to borrow additional money for sustainable investments in their homes for up to € 25.000. Normally for a mortgage, banks look at the liquidation value of the building. But for this investment the return on investment on the energy costs is taken into account. Therefore, not income, but expenditure is the most important criterion. In CH, many banks offer MINERGIE mortgages with special conditions for builders of a MINERGIE-certificated house. In FR, there are zero interest loans for buildings following the Low Consumption Building Standard.

In NL, there are a number of **innovative project developers** who offer housing in line with Dutch policy, but also include several options for energy efficient measures. When consumers opt for one of these options, they get a 50% reduction on the additional costs to include the energy efficient measure.

Attempts regarding **education and training of professionals** were mentioned by CH and HU interviewees. In CH, there are constant improvements, new courses, trade shows, etc. where professionals can learn more. In HU, conferences and education programs have been organized to educate professionals.

2.3.3 Recommendations for Future Actions and Main Stakeholders

All in all, the key players regarding energy efficient house constructions can be divided into two categories: first, **the government** (including national or cantonal authorities responsible for regulations and subsidies as well as municipalities - which have a key role ensuring accurate implementation); second, **building professionals** (including architects, artisans, and tradesmen). NO and UK respondents perceived the government as the most important stakeholder, CH the building professionals, whereas in FR, both are seen as important.

Governments were felt to have a key role to play in establishing the national or regional (in CH, cantonal authorities are responsible for the building sector) planning framework. They defined building standards and subsidies. The interviewed stakeholders suggested making energy-efficiency norms stricter. FR, HU, and UK stakeholders thought it was important to have higher subsidies directly for private individuals.

Local planning authorities were thought to play a key role in ensuring that new developments comply with building standards (UK, NL) and that subsidies are properly used (NL). They also plan the development of residential areas and often are quite large builders as well (NO). From the point of view of stakeholders in NL, municipalities were felt to be best suited for providing more information to both people who purchase a new house and people who are looking to make energy-saving adaptations to their current house, because they have direct contact with buyers of new houses and people requesting building permits.

Professionals are further key stakeholders, although it was suggested that they often they lacked knowledge and will. However, their skills and actions precede further diffusion and lower costs of low energy housing. To promote the technical sectors and to generate interest in the professions related to construction and ecology, many interviewees (CH, FR, and HU) recommended better training for architects and tradesmen.

Banks were also seen as important stakeholders by many respondents. In countries (UK, HU) where no special mortgages for low energy housing are available, interviewees mentioned the introduction of such loans as important to overcome financial barriers. The success of these ideas (e.g. green mortgages with lower interest rates) in other countries (CH, NL) confirmed this statement.

Consumers have an important role to play in creating demand for low energy housing and thus encouraging the construction industry to address the current skills-gap. HU, UK and NO stakeholders thus considered awareness raising and information campaigns by NGOs and the government as highly important. NO emphasized the importance of not only tapping into consumers' environmental consciousness, which in NO is present, but also to have them consider economics, both the reduced costs of using an energy efficient dwelling, and a possible, rather likely increase in real estate value.

2.4 Refurbishment

Barriers and attempts regarding energy efficient refurbishment are similar to those in the previous section (new house construction). The market transformation, however, has not yet progressed so far. Interviews about the purchase of domestic appliances were done in all participating countries.

2.4.1 Main Barriers to Change

Fig. 7 provides an overview of the perceived importance of the barrier categories in the new housing section, Fig. 8 show the average rating of the specific barriers to low energy house construction and energy efficient refurbishment.

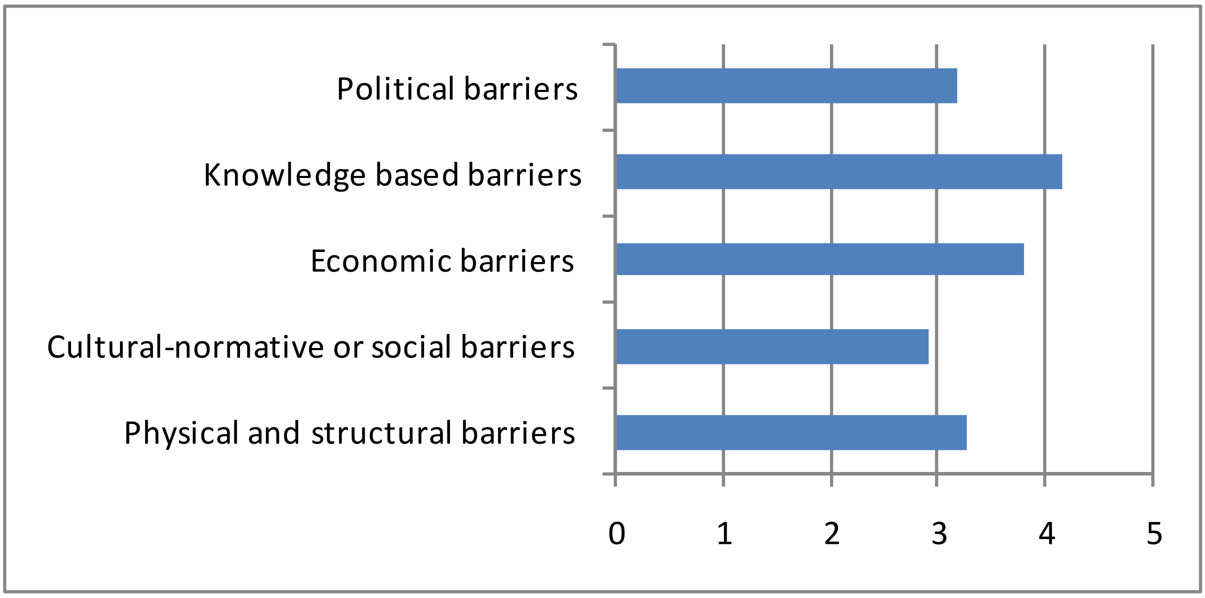

Fig. 7: Average of respondents' ratings of barrier categories for energy efficient refurbishment (from 0=no perceived barrier to 5=very important barrier).

Overall, the most important barriers regarding refurbishment are knowledge-based barriers. First and foremost, there is a lack of cost transparency; second, homeowners lack technical knowledge (not perceived as a barrier in NL); thirdly, they have difficulty in identifying competent artisans (especially important in FR), or the right information (UK). Many interviewees perceived the lack of knowledge among professionals as an important barrier. A UK stakeholder mentioned that the building sector lacked the skills and knowledge required to build low energy houses. The knowledge of professionals was thought to be especially important because homeowners usually lacked knowledge and time to identify measures.

Again, the high initial costs were perceived to be the most important barrier by many stakeholders. A stakeholder from HU mentioned that it may be difficult getting a new loan for investing in energy efficiency. When a household already has a loan for the purchase of their home, an additional loan might it often will not be able to pay back a second or third loan. In CH, because of the high costs of full refurbishment, people often only do partial refurbishment. Here, the design can be done by artisans themselves at little extra cost (compared to hiring an architect to do a full refurbishment), but partial refurbishment only includes energy efficiency measures to a limited degree.

Structural and physical barriers were also very important in the context of energy efficient refurbishment. The slowness of joint ownership decision-making processes is a problem that exists in countries with a high number of condominium apartment buildings with multiple owners, such as in CH, HU, and NL. In general, there has been little refurbishment done over the last years. CH interviewees mentioned that, over the last few years, more and more houses are reaching a time where refurbishment is necessary, but the subject of refurbishment has been pushed aside for quite a while. The low refurbishment rate is also linked to the high portion of population that rents (approximately 70%). Landlords do not have to pay for heating but would need to make the initial investment in the case of refurbishment.

Regarding political barriers, insufficient governmental support was perceived as an important barrier in UK, NL, and NO. Furthermore, the lack of consistent policy is especially an issue in FR, CH, and NL. In the latter, the unreliability of subsidies is the main problem. In CH, the federal and cantonal regulations do not always correspond in the construction sector, and regulations differ between cantons.

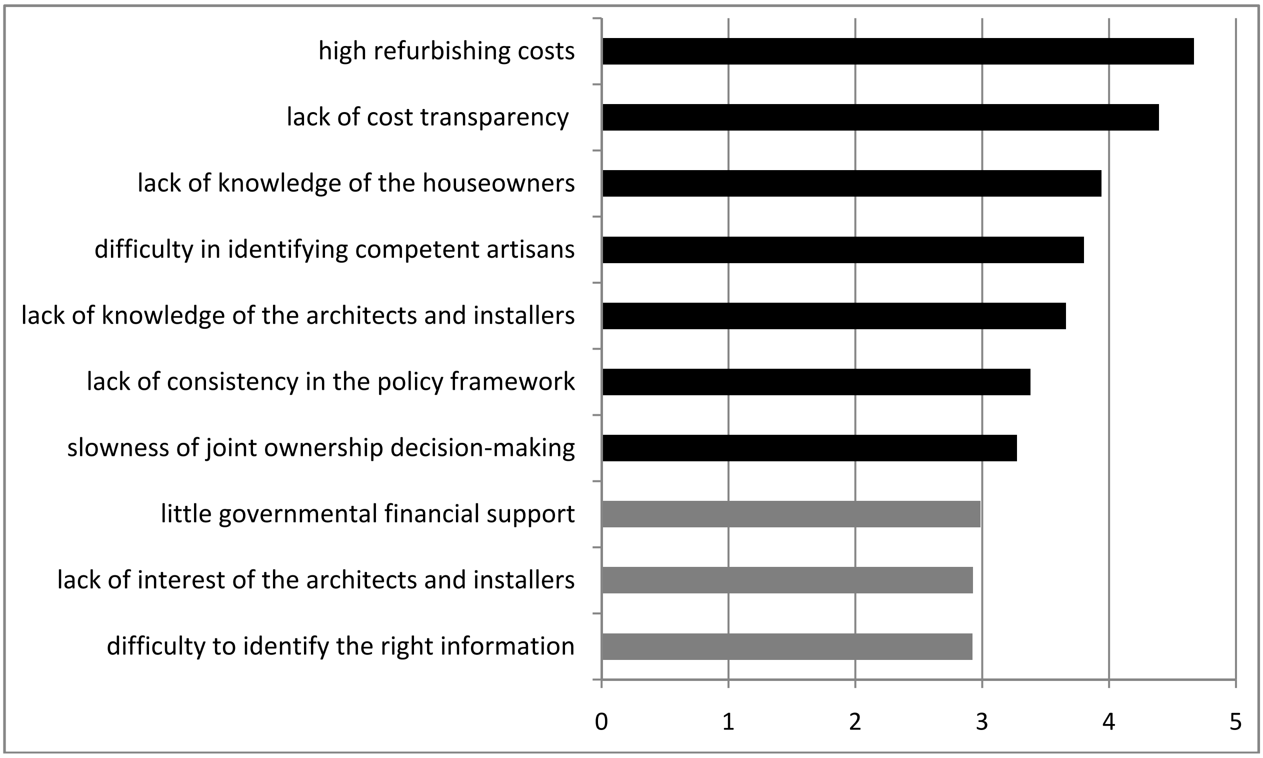

Fig. 8: Average of respondents' ratings of barriers to energy-efficient refurbishment (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

2.4.2 Relevant Past Attempts

Past attempts to enhance energy efficient refurbishment include mainly information campaigns and financial support. In terms of **information campaigns**, the main contribution comes from NGOs with their long term work on public awareness (NO, CH, HU, UK). UK stakeholders see independently led campaigns as playing a key role in overcoming political barriers, for example through creating the political space needed to develop further reaching policies. For the transition from general advice to detailed and specific solutions for individual homeowners, a NO interviewee suggested looking at his neighboring countries: Sweden established energy efficiency advisory boards/offices in municipalities, and Denmark advises consumers through memberships in a variety of organizations. In HU, the Alliance of Energy Efficient Municipalities and the Alliance of Climate Friendly Settlements have been founded to help more and more settlements to have an own climate strategy and climate programs. In FR, “Energy Info Rooms” have been set up[2]. In CH, efforts to improve knowledge and awareness about refurbishment for the purpose of energy efficiency have come at various levels. The Swiss Federal Office of Energy, the Swiss Homeowner's Association, the cantons, and others have attempted various awareness tactics to make homeowners more knowledgeable and informed. So there are many points of contact run by the cantons with experts where consulting services and tips for home refurbishment are available. An important contribution regarding information comes from the MINERGIE label. Recent political activism has raised a lot of interest in refurbishment. These political discussions and activities have made many homeowners more aware of the issues.

Regarding **financial support**, the success of subsidies has been - as in the area of new house construction - relatively modest to date. Governmental subsidies in NL are perceived by consumers to be very unreliable and therefore not attractive. Subsidies in UK (Warm Front programme provides

[2] The “Energy Info rooms” are part of a network developed by ADEME (the French Environment and Energy Management Agency) and by local authorities. They are local spaces where households can bring information and advices on energy efficiency and climate change: energy savings, investments (insulation, refurbishment, etc.) and taxes available. There are about 160 “Energy Info Rooms” in France.

grants for energy efficient refurbishment in low income households, energy supplier funded CERT schemes) have more recently supported low cost measures such as loft and cavity wall insulation and are intended to help to develop the supply chain on infrastructural insulation and energy efficiency measures. In CH, some cantons offer financial support for energy efficient refurbishment, though the support is small when compared to tax deductions (see next paragraph). The success of such efforts may be seen in individual cases, but on the whole, the effect is less visible. Also, the amounts set aside for financial support are often very quickly used up. In HU, the National Energy Efficiency Program supports energy efficiency measures (insulation ob buildings, windows and doors, modernization of the heating system), investments and the application of renewable energy measures. Households can apply for maximal 15% of their total investment in 2007. Intensity and conditions of the support change every year. The Panel Plus Program “Panel Plus” is a loan program that started in 2005. Loan and grants are available for investments to improve the thermal insulation of buildings (roofs, doors, windows, facades and cellars) as well as for the modernization of district heating in block houses.
In CH and FR cost of refurbishment for the purpose of energy efficiency can be deducted from taxes. In FR, people who do not pay revenue taxes get tax credits for energy efficient refurbishment. The amounts of these tax credits are rising and they target more eco-efficient products. In CH, partial refurbishment is currently more beneficial than complete refurbishment. This may be improved substantially in the coming years. Also, it is important to consider that the tax deductions vary between cantons.

As for the construction of new low energy houses, some banks (HU, NO, CH, FR, and NL) successfully set up a scheme (lower interest rent) for those who need to finance private energy efficient refurbishment measures. This has not really been developed as an option in UK. In CH, many banks offer advantageous conditions for refurbishments that are done according to the MINERGIE standard. These lower interest rates for MINERGIE loans were viewed as successful by all of the interviewed stakeholders. In FR, all banks are obliged to offer loans without interest for refurbishment packages.
Respondents from FR and CH mentioned first steps that have been taken in training professionals as artisans and architects. FR respondents mentioned the lack of commitment from the state regarding this possibility. Only the artisans’ federations are starting to take action with regard to training, but this is not consistent. In CH, many courses are offered to further educate architects. These innovations are being taken advantage of and the programs are constantly being expanded, yet most architects have still not been reached.

To address the slowness of joint ownership decisions, HU changed the real estate law: if inhabitants of multiple dwelling units wish to refurbish, instead of the previous 80%, now only 50% must approve it.

2.4.3 Recommendations for Future Actions and Main Stakeholders

Interviewees from all countries except CH identified the government as the key stakeholder with respect to home refurbishment. Whereas UK interviewees are unanimous on this point, some interviewees of other countries see artisans (CH, FR, HU, NO, and NL), or consumers (NO, HU) as the most important stakeholder. In CH, the government is also seen as having an influence, but not as the main stakeholder.

The **government's** importance as a stakeholder lies in its key role in establishing higher building regulations and standards; providing subsidies to stimulate the market; and regarding information, communication and further education. NO respondents think that the government should rethink priorities and prioritize more energy efficiency measures. Today grant systems support electricity from windmills with three times as much money per unit than for electricity "liberated" by efficiency measures. In FR, interviewees suggest making sure that only the most energy efficient products and measures are supported and to give greater priority to direct subsidies rather than tax incentives.

Some UK respondents suggested that the government links more ambitiously funded grant schemes and refurbishment loans to a mandatory Standard Assessment Procedure (SAP) target for the homes improved. Interviewees were unsure as to how such schemes would be financed however.

Other than the government, the stakeholders mainly involved are **artisans**. It was suggested that there should be more education and training so that they were able to inform households and to provide competent information. In UK, artisans were seen as having a more passive role, and consequently, they would potentially respond to the stimulus created by others rather than seek to promote themselves.
A NL respondent mentioned **salespeople in consumer construction material shops.** Here, competent information also held the potential to be relevant, as many refurbishment measures are currently done by homeowners themselves.

A CH interviewee suggested the introduction of a **refurbishment manager** profession. In an initial neutral consultation a comprehensive integrated concept could be created. It was argued that specialists could rarely view projects from a broad perspective. After viewing the bigger picture, the property owner can turn to various specialists. This initial consultation could be with an energy consultant, but it would be even more helpful to have people that are experts in all aspects of refurbishment, including aspects unrelated to energy. Such refurbishment managers must be well versed in tax questions; understand the concept of working in stages; know how one can get governmental financial support; and they should be able to organize and schedule the different jobs, etc.

2.5 Purchase of Domestic Appliances

When discussing the purchase of large energy-efficient kitchen appliances (like refrigerators and stoves) one must differentiate between different groups of buyers. On the one hand there are private buyers (homeowners or renters) and on the other there are professional buyers (landlords, investors, architects, cabinet makers, etc.). These groups have different interests and motivations. The main difference is that the former use the appliances themselves and consequently must pay for the energy costs arising from their use. Professional buyers do not pay for the energy costs themselves and thus often have other interests such as design, margins, or getting the lowest possible purchase price. Landlords, for example, generally buy the cheapest devices because they do not want to deal with increases in rent. This distinction is especially relevant in the point of view of CH respondents, because a very large portion of population rents (approximately 70%). UK interviewees felt that there should be more 'choice editing' at the top level in order to counteract cultural food infrastructural refrigeration practices.

Consumers have more decision making power when it comes to smaller devices, like pans. For this reason, we analysed the purchase behaviour of cooking pans in addition to that of larger appliances like refrigerators.

2.5.1 Main Barriers to Change

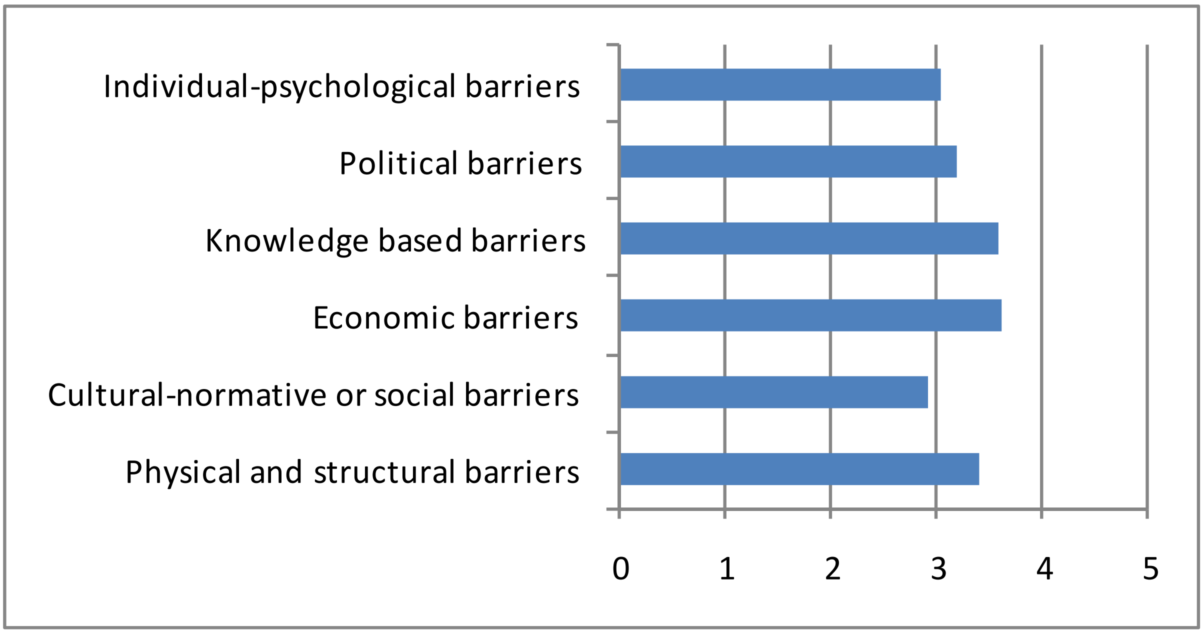

Fig. 9: Average of respondents' ratings of barrier categories for the purchase of energy efficient appliances (from 0=no perceived barrier to 5=very important barrier).

In general, barrier ratings are lower than in the previous sections. This shows that the transformation of the market has already partly happened in the area of appliances. With an average of 3.6, the higher price of energy efficient appliances is seen as the most important. Various stakeholders mentioned however, that actually the costs are not the main problem, but rather the different investment profile and the non-indicated life-cycle-costs.

Awareness of energy issues generally exists, but when it comes to the purchase of an appliance or cookware, the connection to issues of energy efficiency and energy use is not always made. Respondents in CH, NO, HU and NL see this as an important barrier.
Furthermore, from the point of view of most of the stakeholders, the salespeople are often not trained enough to competently advise consumers. Respondents in NO, FR and HU rate this structural barrier as important, respondents of the other countries rate it as of medium importance.

In general, labeling of products was seen as very successful in the eyes of all interviewed stakeholders. Unfortunately the label rating criteria were not adjusted early to account for the improvements in the efficiency of appliances, especially refrigerators. Except for two stakeholders (business and political level), the interviewees saw this as a very important barrier.

Some respondents perceived a lack (FR) or wrong financial support (UK). Interviewees suggested that UK has tended to focus the financial stimuli on things such as insulation and light bulbs, rather than other energy efficient products. This is partly because the liberalized energy market has meant that privatized energy suppliers can choose how to spend energy efficiency incentive payments. Of medium importance is the fact that electricity has not been a first order buying criteria. Price and design are usually the main criteria. The latter plays an important role because the kitchen represents the style and aesthetic taste of the homeowner. Performance is valued as an important criterion, especially by cooking fanatics.

In CH and UK, the tendency of household appliance accumulation is further seen as barrier of medium importance. In UK, there is also a tendency to buy frost-fee cold appliances and “built in” appliances, which are more energy demanding than free standing and non-frost free appliances. This problem is also exacerbated by ‘cultural’ cooking habits revolving around a lot of processed food and readymade meals.

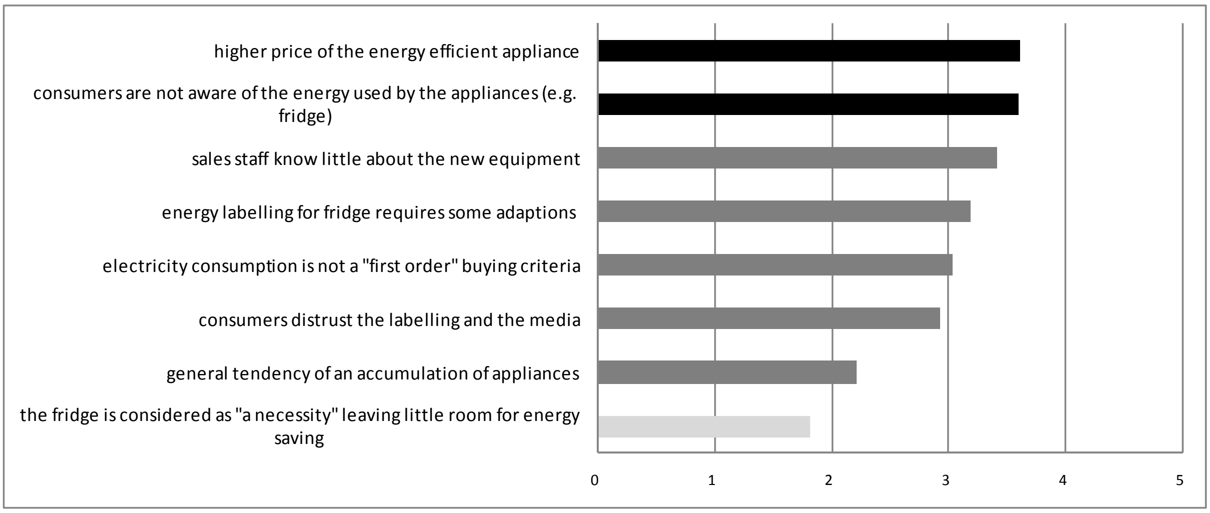

Fig. 10: Average of respondents' ratings of barriers to the purchase of energy efficient appliances (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

2.5.2 Relevant Past Attempts

In all countries, **energy labels** are obligatory for many products and generally regarded as a big success in supplying information to consumers. They increase consumer awareness through simple and understandable information and have been widely accepted by consumers, political, and economic players. However, it was felt that labels need to be re-evaluated in the near future. Some interviewed stakeholders from UK felt that their country lagged behind other European countries on product labeling regarding fridges and freezers. Also, a respondent mentioned that there was a political role for the UK government to play in disseminating greater awareness of energy efficient products and practices to consumers.

Besides labels, there have been and still are **other information campaigns and channels**. **Information at the point of purchase** was perceived as essential, especially regarding fridges and freezers because these are usually “distress purchases”, i.e. they are bought because the old fridge has broken and needs immediate replacement. In CH, the topten guide (www.topten.ch) has been created. The guide compares products based on their buying criteria, including operating cost. The objectives of the guide are first to inform consumers and to make them aware of the operating costs of certain appliances, and second to become a reference for all stakeholders, so that the market can become more virtuous in the long term. Based on the CH concept, a similar guide was created in FR. It is, however, not widely known yet.

In CH, one can also find the energy efficiency topics covered consistently in **daily newspapers**, sometimes in special sections dedicated to energy efficiency and particularly efficient devices. Interviewed stakeholders thought that the reporting done in the daily newspapers was very important since these reach a much larger audience than specialty magazines. The latter are read primarily by those customers who are already aware of these issues however. Television and radio also help spread information to make the population more aware of energy issues.

In UK, there have been awareness raising **activities all across the supply chain**. These include convincing trade associations to talk to their members about the value of energy efficient goods, and working directly with retailers, manufacturers and product designers. This helps to facilitate ‘choice editing' (removing the less efficient goods from the market), which is seen as an effective method of addressing the purchase of inefficient goods. Retailers' buyers are trained about according to the criteria they should use to select the most energy efficient goods. There has also been retail staff training, however, these had mixed results because of the high turnover of sales staff. Some of the solutions have also been to encourage product designers and manufacturers in China and other countries to adopt an energy efficiency standard. This cross national working with the supply chain could potentially have effective results for addressing some of the barriers to more efficient appliances.

In FR, the household appliances sector mainly launches communication or **awareness measures conducted separately by various stakeholders**: manufacturers, ADEME and the Appliances Manufacturers' Federation. They each communicate through campaigns in the press; specialized trade shows; advertising slogans; or more innovative actions such as cross-communication. These communication actions have generally been well accepted, well understood and well perceived by all the stakeholders. They are however still insufficient and are sometimes on a very small scale.
Constantly informing the public was perceived as important by a lot of respondents, because otherwise the topic will be forgotten once again. Nevertheless the topic of energy remains abstract. Many people do not know what a kilowatt hour of electricity is.

Besides awareness raising and informing consumers, there have also been some **financial measures**. In NL, government subsidies worked well and thus more energy-efficient household appliances were sold. This measure could be successful again but has been reduced over the last few years as a result of their success, i.e. they became too expensive. NO stakeholders suggested providing subsidies for the highest classified products (cf. Denmark). In NL, producers of household appliances profit from tax reductions if they produced energy-efficient appliances. This was regarded as successful and to be continued, since it was also acceptable for consumers, producers and for the government. In UK, CH and NL, there are clear **norms** with regard to minimum energy-efficiency each household appliance must achieve. This prevents poor appliances from entering the market.

2.5.3 Recommendations for Future Actions and Main Stakeholders

All countries saw the update and reformulation of the mandatory European Energy Label as being important in maintaining the trust and legitimacy of the scheme as a high priority. This process has already been started. The **European Commission** is the main driver in this process, and thus an important stakeholder. The following two points were mentioned by a respondent to be critical in the update of the label: 1) Development of new dynamic criteria for all product categories, within the framework of EU directive 92/75 and in dialog with all relevant stakeholders; 2) Expansion of the energy label to other product categories, such as houses and building materials.

Regarding labeling, a couple of other points were mentioned in the interviews. A NO respondent thought that besides the European Commission, the **European industry** and the **test institutions within consumer organizations** were also important stakeholders, as they contribute in the development and improvement of the labels. A HU respondent mentioned that another high priority is the need to make sure that products are labeled correctly. Further, CH and HU respondents suggested the introduction of an energy label for certain product groups (e.g. gas ovens, cooking pans) that have no energy classification yet. A NL stakeholder suggested the introduction of **financial energy labels** on the European level. Another measure on the national level concerns VAT (Value added tax) reduction for energy efficient appliances to make their more prices competitive with regular appliances.

Furthermore, **producers of household appliances** play an important role. Many respondents thought that the identification and communication of life-cycle costs to be highly relevant. Consumers needed to be told that, even if the initial cost is higher, over the long run they would indeed save money.

FR interviewees suggested a partnership approach between manufacturers and retailers to enhance communication about energy efficient appliances. UK interviewees suggested that Trade Associations should intervene between the different requirements of manufacturers and retailers. **Consumer electronics retailers** were also perceived as key stakeholders by NL, UK and CH interviewees. It was thought to be very important that consumers have access to energy-efficiency information the moment they consider buying a domestic appliance. To persuade them of the value of these appliances, green branding may be of value (UK). In this context, **product designers** are important in regard to an attractive design of energy efficient products (NL).

In terms of communication and awareness raising (a key priority in HU), more needed to be done to promote energy-efficient appliances. Here also the government (UK, FR, NL, and HU), utilities (FR), and NGOs (UK, HU) were considered to be important.

Besides awareness rising, the **government** was considered highly relevant as a stakeholder regarding the introduction of stricter energy efficiency minimum standards (NL, UK, FR, and CH). This measure was seen as very effective. A FR respondent suggested introducing tax credits (example of Italian tax credit for the purchase of efficient refrigerators), or purchasing bonuses (example of bonus given by the Spanish regions for the purchase of an A++ appliance). It was felt that this assistance must be provided by the government, through the release of financial funds, and by utilities.

2.6 Purchase of Cars

Purchases of energy efficient cars can be divided into purchase of fuel efficient cars and hybrid cars, as the main barriers facing the two types of cars are different. Stakeholders were interviewed about fuel efficient cars in CH and HU; CH, FR, UK, HU, and NL all did stakeholder interviews about the purchase of hybrid cars.

2.6.1 Main Barriers to Change

Purchase of Fuel Efficient Cars

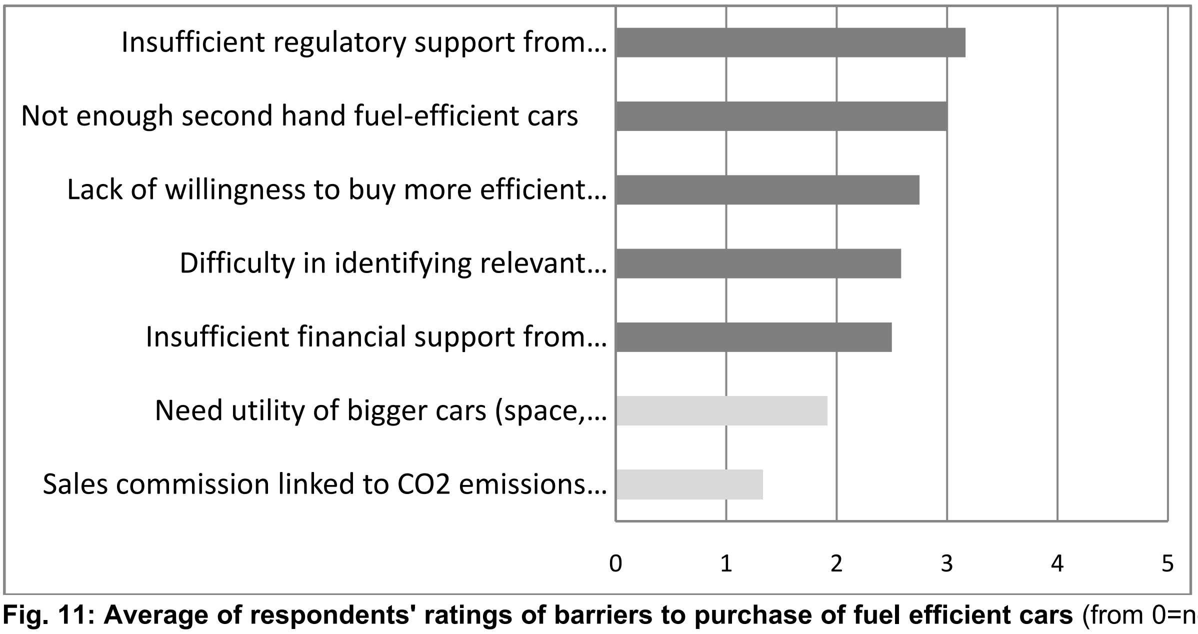

Fig. 11: Average of respondents' ratings of barriers to purchase of fuel efficient cars (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

In CH and HU, stakeholders were also interviewed about barriers to the purchase of fuel-efficient vehicles other than hybrids. In contrast to the barriers facing the purchase of hybrids, on average **fuel-efficient cars are not any more expensive than inefficient cars**. The main barriers the interviewees from these countries saw were the insufficient regulation surrounding fuel-efficiency standards for cars. Likewise, in both countries, interviewees agreed that fuel-efficiency has low or no priority for car buyers.

Purchase of Hybrid Cars

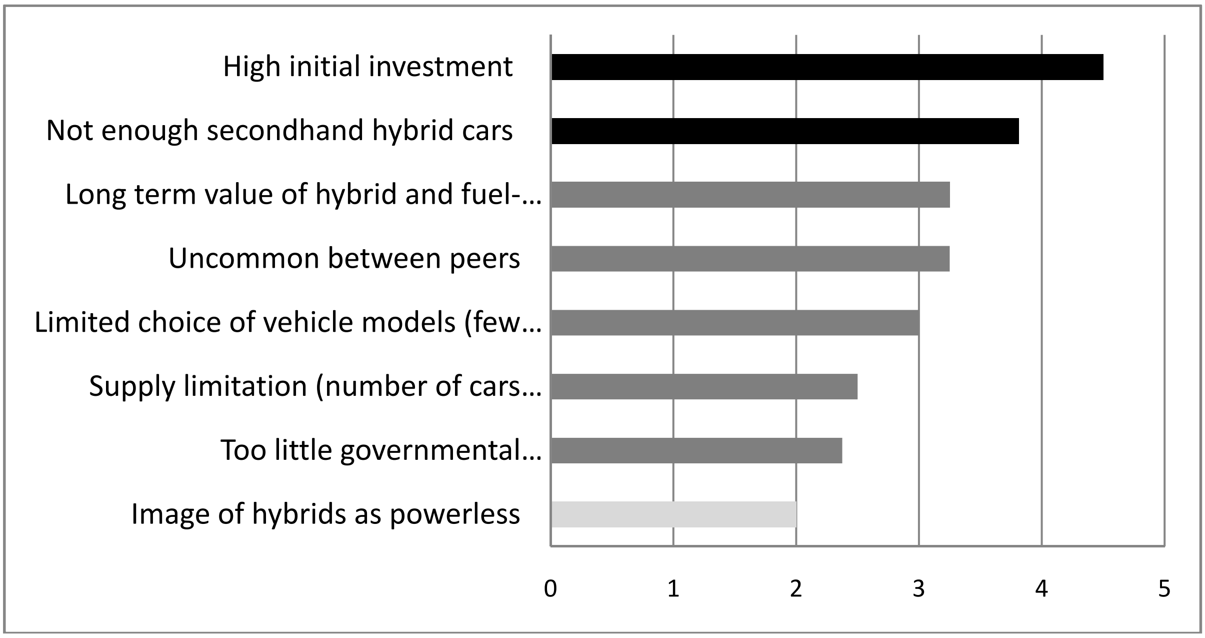

Fig. 12: Average of respondents' ratings of barriers to purchase of hybrids (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

The main barrier for hybrid cars is the high price tag, followed by the fact that there are few models to choose from (where either barrier could be seen as the cause or effect of the other). In addition to the high price, interviewees thought that car buyers did not have a clear picture of the long-term value of hybrids, which would make the price an even larger barrier since it remains unclear what the added value is for buying the more expensive car. In NL, interviewees also saw the barrier of peers not having the same type of car as being quite important as well. In HU, the lack of environmental awareness was also agreed upon as a major barrier.

2.6.2 Relevant Past Attempts

For fuel-efficient vehicles, past attempts have included schemes such as **Bonus-Malus**, which aim to reward efficient cars and discourage inefficient cars. Also, attempts at improving awareness have centered on **energy-efficiency labels**, which interviewees admitted have not been as successful as was hoped for, and that the label needed to be changed to be more user-friendly. Another interesting attempt is the **popular initiative in CH to ban SUVs**. While none of the interviewees expected the initiative to pass when it is voted on this next year, many CH interviewees mentioned the initiative, which may show that it has received the political attention that the Young Greens were aiming for when they developed the initiative.

Decreased taxes or registration fees for hybrids (or other electric or efficient cars) constitute one major attempt to lessen the cost barrier. (HU, NL, UK) Another change in policy in the UK was a change in licensing laws which now encourage smaller, more fuel-efficient engines and vehicles.

Other efforts include **improving the image of hybrids**. In HU, the Toyota mobility week allowed people to ride free in a Prius on the main bus lines. The Touring Club of Hybrid Vehicles in FR has been aimed at informing people to help them get over negative conclusions about hybrid technology (this was a small effort). Interviewees in CH mentioned the attempts of Toyota to improve the image of the Prius when, after the first release, it was not seen as a good looking or aesthetically pleasing car. (CH, FR, HU)

2.6.3 Recommendations for Future Actions and Main Stakeholders

Fuel-Efficient Cars
For fuel-efficient cars, the main suggestions from interviewees were to **improve the information platform** regarding efficiency (including labels, awareness campaigns, etc.); **shifting to use true costs** or true pricing (including environmental costs); and **increasing governmental regulation of efficiency standards** (CH). Other possibilities were the same as for hybrids (see below).

Hybrids
It was felt that central and local governments should hold responsibility for **lessening the economic barrier** facing hybrids, though financial incentives such as decreased taxation and free parking for hybrids. Likewise, hybrid manufacturers could also decrease the price by not including development costs in hybrids' price, or offering smaller, cheaper hybrids to make the technology available to those who cannot afford the high price tag. Making new credit possibilities available would perhaps also lessen the barrier of the high initial investment. Governments should create a gradation for the amount of tax reduction for efficient cars so that the most efficient cars are rewarded more than less efficient cars (to create a distinction between bad, good, better, and best). Other possibilities include the use of schemes such as Bonus-Malus. Besides incentives other ways to lessen the economic barrier facing hybrids would be to focus on developing new battery technologies and reduce reliance on the conventional combustion engine in order to reduce costs for production and the purchase price. (CH, FR, HU, NL)

Hybrids and Fuel Efficient Cars
Raising awareness of environmental issues is important since people have not adopted attitudes of environmental responsibility. On a slightly different but related note, advertisers in the automotive industries can help garner more attention for hybrid vehicles. NGOs should be responsible for encouraging consumers to look at the advantages of efficient cars. (CH, HU, NL)

Encouraging the purchase of hybrids and fuel efficient cars is another important effort that can be done in a number of ways. Cities and towns can have policies that encourage hybrids through schemes such as free city parking. Car dealerships- instruct and encourage customers to buy hybrids. Also, support is necessary from the corporate and government sector to purchase more energy-efficient cars for their fleets. (FR, HU)

2.7 Summary Purchase Phase

Overall, for investment in physical goods, the interviewed stakeholders perceived **the economic barriers** to be the most relevant for consumers. These included mainly the high initial investment costs, but also the low energy price.
Also considered to be of high importance are knowledge-based and political barriers. So, besides the perceived barrier of a higher price, there was felt to be a lack of knowledge about the green products

(i.e. energy mix, appliances and building products). This goes together with the problem that there is often too little information about the products, their costs and effects. Furthermore, energy consumption is not a first order buying criteria and it was suggested that consumers often feel that traditional products or services bring more comfort. Regarding the political barriers, many interviewees mentioned the insufficient or unreliable political support (financial and information). Finally and resulting from the previously mentioned barriers, there is an underdeveloped supply of green products because of low demand.

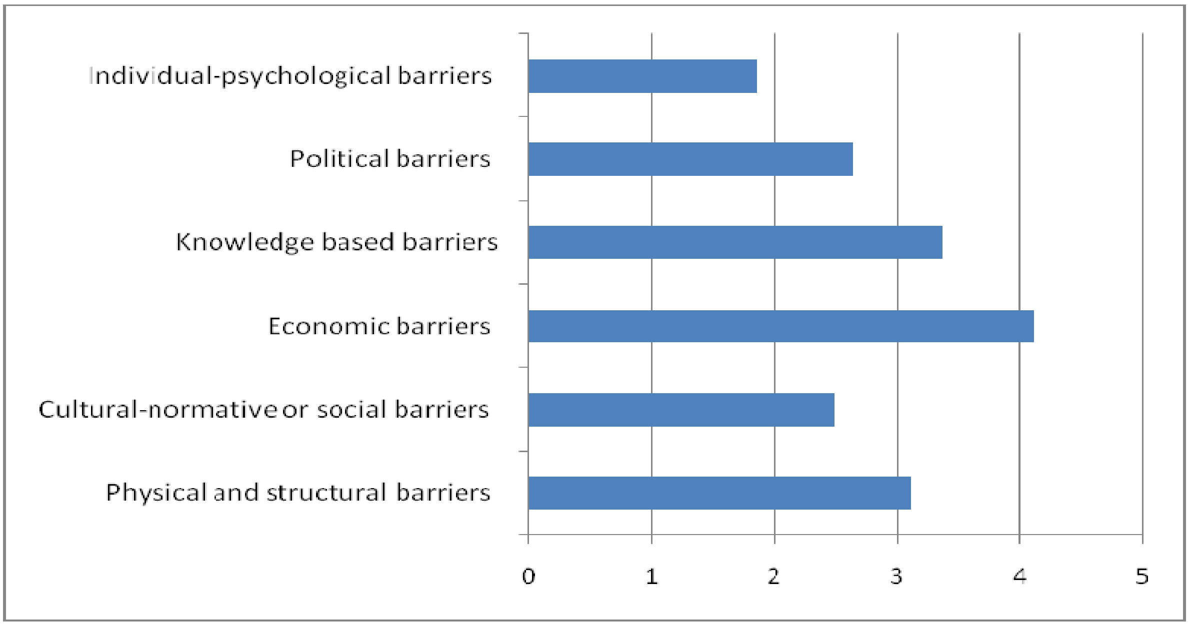

Fig. 13: Average of respondents' ratings of barriers categories perceived in the purchase phase (from 0=no perceived barrier to 5=very important barrier).

Main attempts suggested by interviewees to overcome the barriers in the purchase phase included:

- More information about life-cycle costs on the products;
- Reliable long-term governmental subsidies, fiscal incentives and mortgage guarantees with special conditions for investments in energy efficient housing and photovoltaics;
- Governmental or EU steering by introducing stricter rules, guidelines and regulations

In the analyzed fields as well as between the participating countries, there are large differences in the progress towards a sustainable energy system. Market transformation is generally accepted to have worked for many appliances in the EU, with particularly good outcomes in the cold appliance (fridges, freezers and fridge freezers) and wet appliance (washing machines, tumble dryers, dishwashers) markets. The appliances market is thus considerably more advanced than the housing market for instance, which itself is slightly ahead of the photovoltaic market. Greater cross-field learning may be possible, especially regarding appliances and also the housing market. Experience in the appliance sector has shown the main components of a market transformation strategy to be labels and minimum standards. As for the stakeholders involved, all of the actors in the chain have played a part in beginning to transform the appliance market: manufacturers, retailers, installers, and consumers. Also, the European-wide nature of policy was felt to be particularly beneficial. In UK for example, there were fewer efficient appliances on the market than in many other EU countries when the policy was first introduced. The availability elsewhere of more efficient products is playing an important role in helped the UK market move towards becoming more sustainable since retailers could at least import energy efficient appliances. However, houses and building infrastructure are currently much more expensive and long-lived than appliances and cannot just be exchanged.

Further learning opportunities can be found by cross-country comparison. CH is very advanced in the low energy house construction with the great success of the MINERGIE label. In the opinion of interviewed stakeholders, the key factors of this success have been the following:

- reduction of construction costs, the extra costs are today about 5% and the savings sufficient to enable a fast return on investment)
- clear technical requirements
- aesthetics are quite flexible
- support by authorities and some banks

3. Use Phase

Regarding the use phase, the project looked at heating, cooking and mobility behavior. In mobility behavior, we analyzed the barriers in regarding public transport, walking or biking for short distance trips and car sharing.

The identification of experts in regard to the use phase is felt to be critical. The interviewed stakeholders have experience with studies about energy efficient behavior of consumers (regarding their heating, cooking, or mobility practices), campaigns to encourage energy efficient behavior, or have been involved in discussions about the subject in their area of work. Some of the interviewed stakeholders' knowledge also came from their personal experiences i.e. their own heating, cooking and mobility practices or those of their family or friends.

3.1 Heating Behavior

Interviews about heating behavior were done in CH, HU, NO, and UK.

3.1.1 Main Barriers to Change

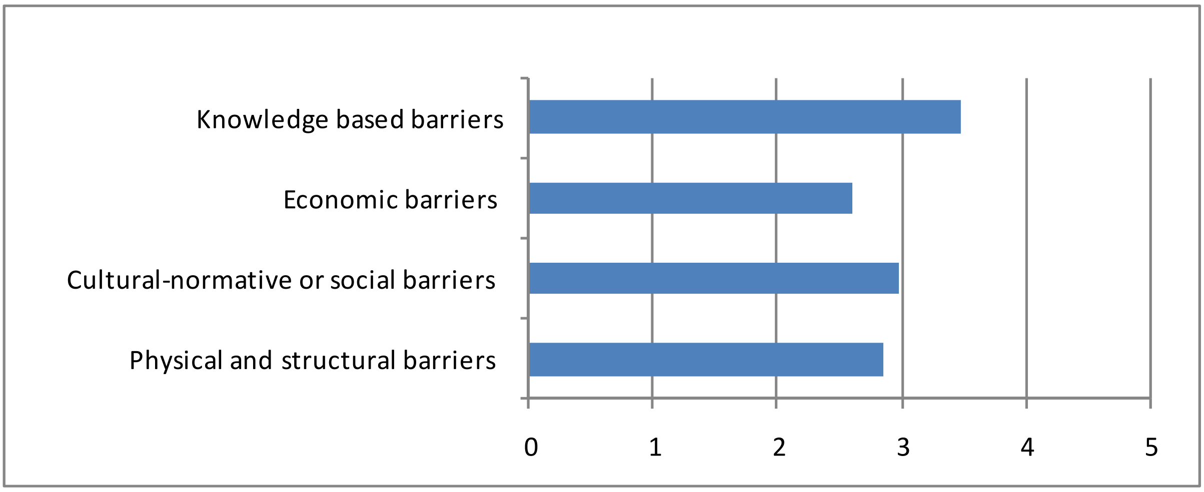

Fig. 14: Average of respondents' ratings of barrier categories for energy efficient heating behavior (from 0=no perceived barrier to 5=very important barrier).

The highest ranked barriers here were found to be the lack of will to reduce temperature as well as the lack of knowledge of inhabitants about airing out rooms energy efficiently. The first barrier was seen as being of very high importance, especially by CH and FR, but also by HU and NO interviewees. In CH, many people live with the temperature set at 24°C. This is a luxury that people can afford, because energy is not expensive. Yet such a high room temperature is unrealistic when you consider that just one degree lower could reduce energy consumption by 7-10%. The second barrier - lack of knowledge about airing - was ranked highest by NO interviewees, but CH, HU and NL also perceived it as important. People often do not have a clear idea of how they can influence energy consumption as inhabitants. Usually they know approximately what energy efficient living means, but they have no idea about the exact numbers, like how much energy is wasted when a window is left open all day for instance.

The presence of a thermostat is important as it gives consumers the possibility to regulate temperature. In CH and NL this is less of an issue because radiators in apartments usually have one.
Another issue mentioned by the CH interviewees were poorly insulated walls or windows. When there is bad insulation, the surfaces are cold, and as a consequence, people heat the room even more to make the room temperature relatively comfortable. This is a very important issue in HU.
The UK stakeholders perceived the following social barrier as important: over-heating a home is not considered to be socially unacceptable, whereas this is rather the case regarding homes that are too cold.

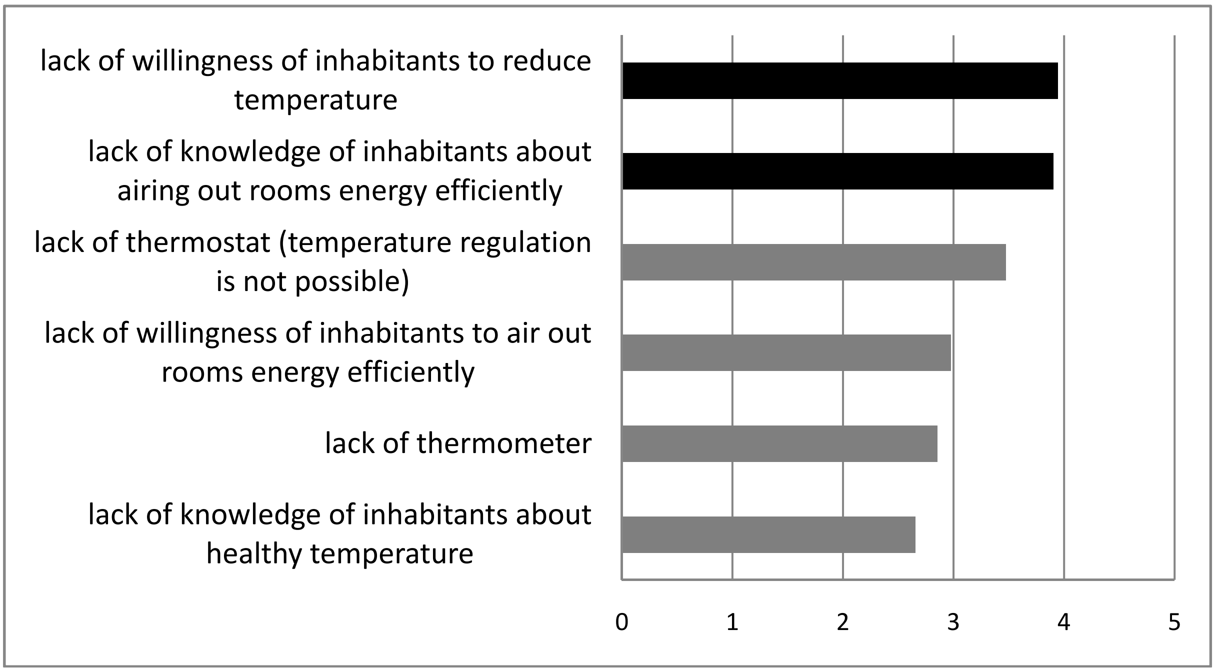

Fig. 15: Average of respondents' ratings of barriers to energy efficient heating behavior (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

3.1.2 Relevant Past Attempts

To change heating behavior, respondents from NL, CH, HU, and NO mentioned **information and awareness raising campaigns.** However, it was felt that these often did not have a big effect. A NO interviewee mentioned the importance of celebrities and opinion leaders as role models.

UK and FR have a couple of advice centers which are intended to overcome the lack of information available to the public. UK respondents suggested that advice provision should be localized with a more embedded network of provision. Another approach taken in NO is to offer courses to caretakers and personnel responsible for the running of furnaces and heating systems in larger units, like apartment buildings.

Regarding **financial incentives**, UK has a program of providing grants for energy efficient refurbishment for low income households. Although the program provides the tools for home heating behavioral change i.e. temperature controls, installers do not spend an adequate period of time explaining their use and are often not qualified to do so. In CH, the billing procedure for separating individual heating costs has been implemented. The idea behind this scheme is that people should be rewarded for efforts to save energy. (Rule: 60% of the costs are variable (based on the consumption) and 40% are fixed (based on the number of square meters.)

3.1.3 Recommendations for Future Actions and Main Stakeholders

Consumers themselves are a key stakeholder because it is only they who can change individual behavior. A FR interviewee thinks that it is above all “society” (in the sense of social standards) which is important, in that it dictates standards and fashions, where ecology and energy savings are given an increasingly important role. In spite of this, habits and practices are hard to change and are only changing slowly. The FR respondent mentioned the example of the regulation standards for comfort in terms of heating (19°C) that are not respected in homes. The standards set have had very little impact - indeed none at all - on practices. Habits regarding comfort are more embedded. Several stakeholders felt however that simply engaging consumers further wasn’t enough to stimulate embedded behavioral change.

In UK, the **government** was identified as the stakeholder with the most significant role in influencing behavioral change. Also for HU and FR, this stakeholder was considered important. A UK interviewee suggested that government should ensure that every home should have a smart meter by 2020, and should support the delivery of a wide scale program of face-to-face advice provision. Also, government should ensure that energy efficiency and climate change are covered by the curriculum and taught to children routinely throughout their education.

Further, **energy suppliers resp. heating installers** were also seen to have a key role in the provision of higher quality information and tools through improved feedback on billing and the provision of smart metering (UK). Also **landlords** could play an important role in this regard by ensuring tenants know how to use their heating system. They could also provide smart meters.

In regard to awareness raising and provision of information, there were many stakeholders mentioned, including **public authorities** (UK), **media/ press** (UK, NO), **mavens** (UK), **schools** (UK), **celebrities** (UK, NO), and **community leaders** (UK, NO). HU respondents thought the most important attempt for the future would be awareness raising through campaigns, competence centers, etc. A UK respondent thought that the delivery of face to face advice and more specific advice guides approved by a recognized body should be key components in addressing the knowledge-based barriers. In FR, an interviewee suggested using the “Energy Info Rooms” to inform home-owners and energy performance audits when buying property and moving house,

3.2 Cooking Behavior

The subject of cooking behavior has been chosen based on a survey of Bush *et al.* (2007)[3]. They estimated the influence of user behavior on energy consumption based on experience (variation in surveys) in different sectors and found the highest savings potential of 50% in the areas of lighting and cooking/baking. The area of lighting is less relevant today since the EU has decided to ban conventional light bulbs, and this subject has also been analyzed in many studies recently.
Interviews about cooking behavior were done in CH, HU, NO, FR, and UK.

[3] Bush, E., Josephy, B., & Nipkow, J. (2007). *Energetisches Einsparpotenzial von Fördermassnahmen für energieeffiziente Haushaltgeräte*: Bush Energie GmbH & ARENA.

3.2.1 Main Barriers to Change

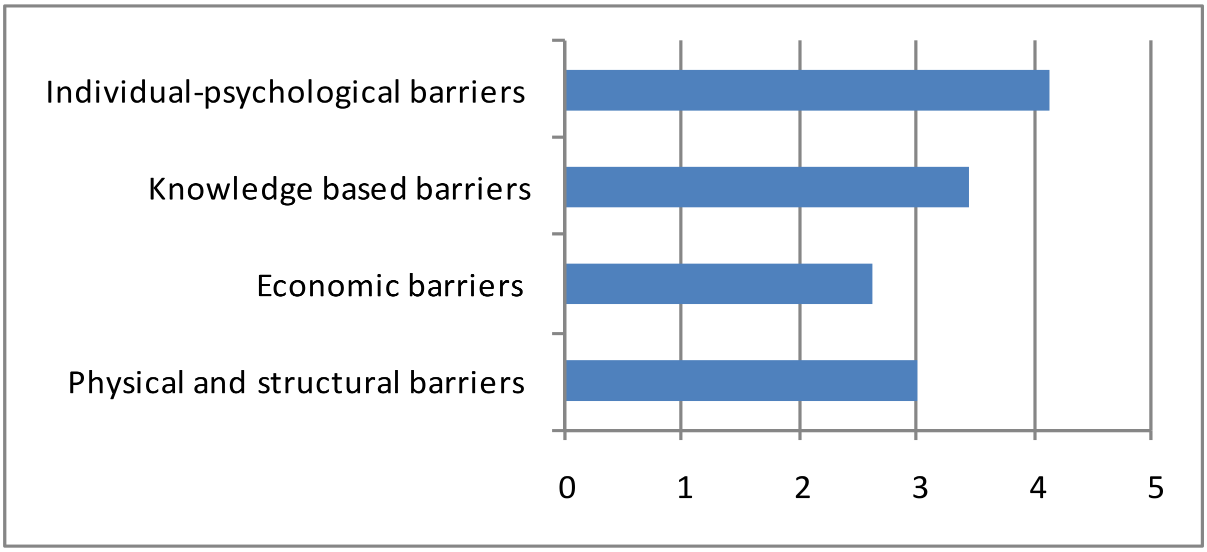

Fig. 16: Average of respondents' ratings of barrier categories for energy efficient cooking behavior (from 0=no perceived barrier to 5=very important barrier).

The barriers to energy efficient cooking were mainly thought to be individual-psychological barriers. The biggest barrier from the point of view of all interviewed stakeholders was lack of will in saving energy. When cooking, the main thing that seems to matter is taste – the meal should taste good and should also be relatively fast to prepare and healthy. To pay attention to energy efficiency on top of all that is perhaps too complicated for many consumers. Reasons for the lack of will are also related to low price and invisibility of electricity.

The lack of will is also related to the fact that it is extremely difficult to change habits and patterns of behavior. Cultural habits of cooking are often not energy efficient. In UK for example, cooking habits are often quite different from the rest of Europe. Consumers cook a lot of processed food and ready-made meals. This requires more fridge/freezer space. In the point of view of HU respondents, the main reason for the lack of motivation in their country is that people want to follow more wealthy lifestyles and consumption patterns.

Individual-psychological barriers are to some extent influenced by information, economic, and structural issues. Lack of knowledge is perceived as important by all interviewees. A majority of the population has an idea that they can influence their energy consumption through their behavior. However, awareness about energy efficiency is often missing as well as the knowledge about what specific actions are needed to cook in an energy efficient manner. The importance of this knowledge barrier is thus strongly influenced by a structural issue; i.e. the fact that one does not see how much energy is used when cooking and how much could be saved through different activities. This barrier was perceived as important or of medium importance by all interviewees.

It was felt that the difficulty of finding the correct information may also lead to a lack of knowledge. This difficulty was perceived as an important barrier especially from the point of view of interviewees from business. Respondents from semi-public organizations and NGOs thought that there was enough information available, and if somebody looked for it, it is not difficult to identify. Regarding the economic barriers, except for NO and CH respondents, all stakeholders perceived the low cost of electricity as a relevant barrier to energy efficient cooking.

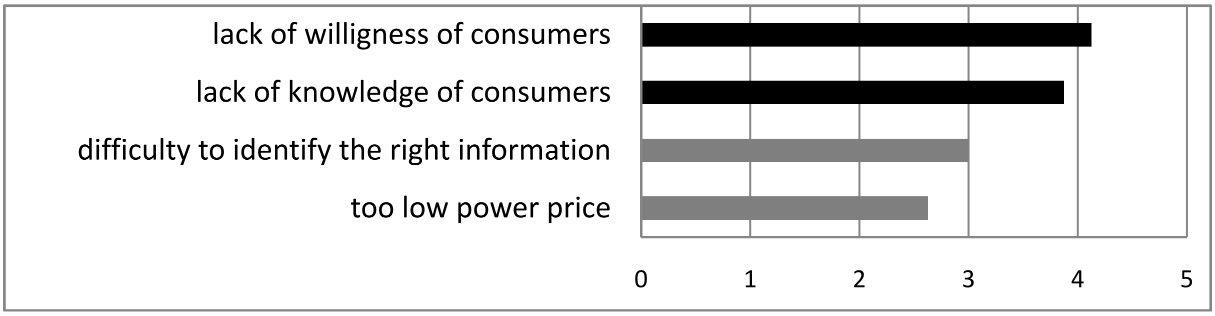

Fig. 17: Average of respondents' ratings of barriers to energy efficient cooking behavior (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

3.2.2 Relevant Past Attempts

A UK respondent mentioned that cooking practices involve specific moments of consumption. As a result, and for household appliances more generally, the stakes involved are not as high, for example, as heating, and special measures in this area are few.

In CH, NGOs, the federal government, and the media had some **information campaigns** in recent months. Also, there have been some campaigns and informational brochures in the past from the Swiss Federal Office for Energy, industry and consumer group initiatives, and NGOs like WWF. Those who wish to inform themselves can find much information on the internet. The question remains on whether the information available actually reaches the consumers. In UK, awareness raising advertising has been used to address consumer behavior around the inefficient use of products. However, a UK respondent thought that whilst there was evidence to suggest it *can* change behavior in the short term, people do return to their former behavior. In HU, there have been campaigns on energy efficiency, informational flyers with energy efficient cooking tips were distributed.

3.2.3 Recommendations for Future Actions and Main Stakeholders

In order to foster energy efficient cooking, it was felt that there needed to be more specific information for consumers regarding the operating cost of household appliances, and consumers needed to be ready and willing to change their behavior. These remain voluntary measures at the moment however because no one can be forced to change their behavior. All respondents argued that it was difficult to change individual behaviors, but CH respondents from the NGO and the semi-public organization came up with several possible actions to start with:

- In CH, **schools** could make an important contribution to the spread of knowledge, as all students have to take cooking classes. Cooking schools should emphasize energy efficiency, and the students should receive tips and suggestions on how to cook energy efficiently. Since many students have barely cooked before and have not developed habits yet, this is a very good opportunity to make them aware of their energy use. Moreover, energy efficient cooking should also be a topic taught to household appliance salespeople. They would then be able show the consumers how to properly use the appliances to maximize their energy efficiency while cooking;
- **Consumers** should be exposed to energy efficient cooking tips in as many different places as possible. In some newspapers and magazines, recipes are featured every once in a while. Next to the preparation instructions there are often things like the preparation time, the level of difficulty, and the calorie content listed. In addition to these, there could also be tips for energy efficient cooking mentioned. Economical cooking suggestions could be integrated in the usage instructions for stoves and pans. Energy saving preparation tips could also be placed directly on food packaging. For example, on a pizza box it could say that it makes more sense to heat a piece of pizza in a pan with a little oil than to bake it in the oven. In cookbooks the issue of

energy efficiency could also be featured more prominently. Furthermore, at cooking demonstrations or on cooking television shows the viewers could be taught about energy efficient cooking. It would make sense to work with famous chefs. They could definitely help spread proper cooking habits to a larger audience, and even more importantly, the topic of energy efficiency while cooking would become more prominent.

- Further, a FR respondent suggested setting up **incentive-based pricing**, i.e. a tool that allows excessive energy consumption to be taxed in order to make consumers more responsible.
- In addition, it could be useful **to evaluate the energy consumptions of households** so that consumers would be more aware of their consumption. Utilities could thus establish consumption assessments and provide personalized advice to help consumers consume less.
- A HU stakeholder thought it would be helpful if **manufacturers** inform consumers about energy efficiency.

3.3 Mobility Behavior- Public Transport

This section will look at behavior in terms of use of transport options. We have divided the section into three subsections: use of public transport, use of biking and walking in place of cars, and use of car-sharing. As can be seen in the following three tables, there are overarching themes across the different branches of mobility use-behavior. The major barriers that are the same in all three areas are "longer travel time," the "change in lifestyle required," and the "inconvenience/less comfort" that traveling without a personal car entails.

However despite these similarities, each section also has barriers which are specific to that mode of transport. For example, major barriers specific to public transport include the overloaded capacity and the perceived higher cost of transport, whereas the main barriers to walking and biking short distances arise from the city planning which caters to cars, and the psychological barrier of wanting to use cars as a status symbol (in addition to other conveniences). For car-sharing, people's lack of familiarity, information, or trust in the concept seemed to be one of the major barriers that keeps them from taking advantage of this service where it is available (which in turn limits car-sharing companies' capacity to expand to new areas).

All countries, FR, HU, NL, NO, UK, and CH did interviews for the public transport section.

3.3.1 Main Barriers to Change

For many countries, as a result of a **long term lack of investment** in public transport, a large scale **shift away from car use would be difficult to implement**. Transport is at its saturation level in urban areas so that one cannot encourage more public transport use unless there were major infrastructure investments.

In addition to the barriers that were rated, interviewees in Switzerland mentioned that that **cost of driving is currently too low**, and that the habitual nature of driving can be very difficult to change. In addition to the similarities found across the different countries, the next paragraphs will illustrate the variation between the responses from the partner countries.

In UK, stakeholders identified the following main barriers in the area of public transport use: Inconvenience; changes in lifestyle required; and the perceived higher cost compared to driving. Door to door travel time was considered to be very important in UK for use of public transit. Other specific problems for UK include the **privatization** of public transport (which creates a profit-seeking situation rather than public service delivery) and the deregulated transport system outside of London makes for irregular provision across UK. One interviewee argued that this privatization has left the government with little sense of how to overcome many of the barriers that exist due to this structural shift.

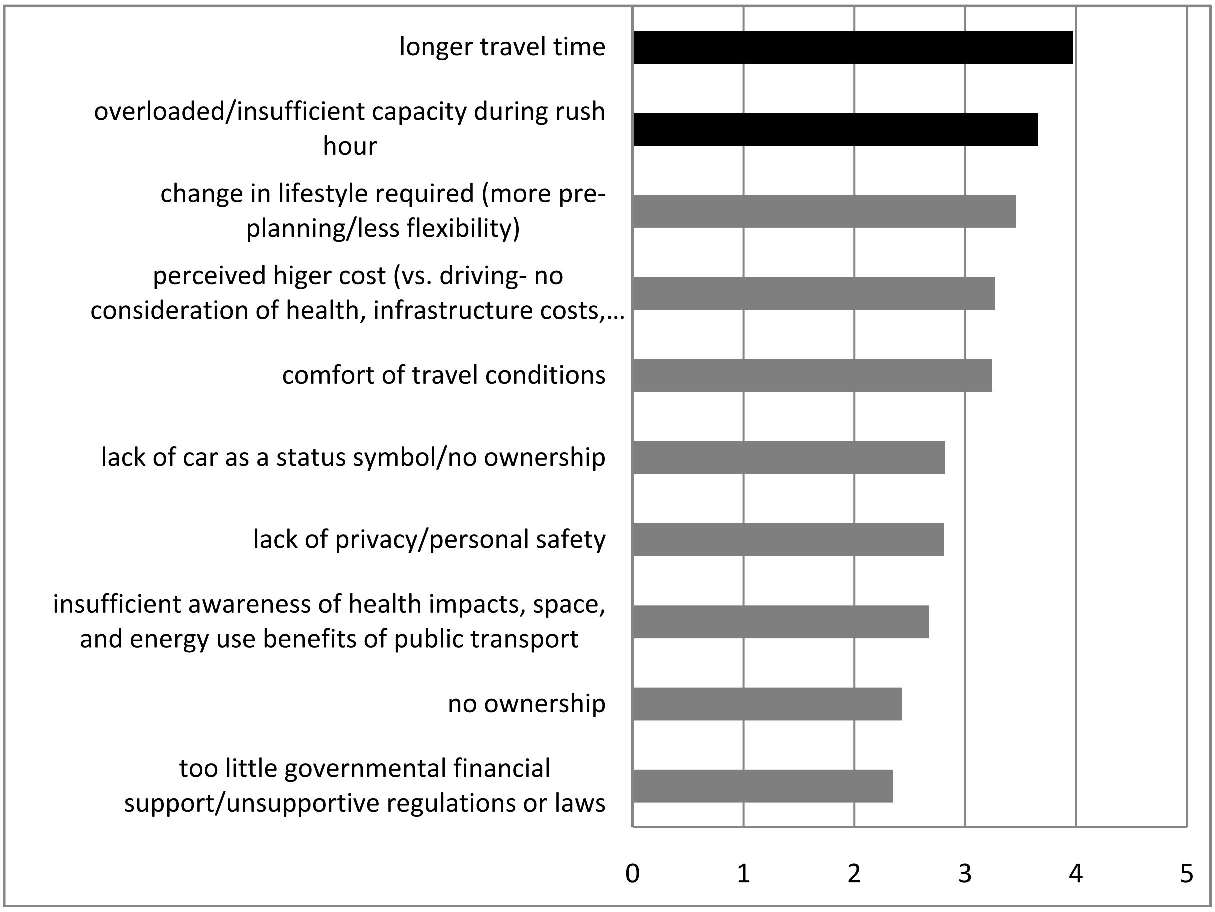

Fig. 18: Average of respondents' ratings of barriers to increased use of public transport (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

For HU, the main barrier identified in the ratings was "comfort of travel conditions." Public transport currently cannot compete with cars due to its low budget; crowded vehicles; dated network; and relatively high prices (fixed prices with no difference for trip length). According to the interviewees' statements, two problems specific to HU are that environmental arguments are less mainstream there (compared to other countries), and that car ownership is viewed as a symbol of freedom and modern life that most people now consider to be important to them.

The three main barriers in FR corresponded to the three main barriers in the table above.

For NL, a park and ride in Groningen was examined. The most important barriers were comfort of travel conditions, and overloaded capacity during peak hours. In addition, stakeholders mentioned two more significant barriers: lack of knowledge about the use of park and ride facilities, as well as previous investments in parking lots in/around the city center. The municipality earns income from these lots and thus does not stop people from driving their car into the city center, even though they do still encourage the use of the park and ride system.

In CH, the most important barriers were the same as those listed in the table above. Additionally, awareness of environmental arguments was also listed as a more important barrier.

The project illustrated by NO was a joint venture project between 6 municipalities in the Kristiansand area. The project deals with public transport, walking and cycling paths, etc. The most important rated barriers in Norway were lack of privacy, longer travel time (infrequent departures), and the perceived higher cost compared to driving. Longer travel time is partly an administrative issue and partly structural since the roads are not wide enough to accommodate both bus lanes and regular traffic.

3.3.2 Relevant Past Attempts

The most **common previous attempts** in this area can be organized into the following categories: increasing frequency of departures (NL, FR, UK, and CH), new ticketing and payment methods such as Oyster Card in London and Navigo Pass in Paris (UK, FR), the quality of stations and bus stops (UK, NL), the introduction of countdown boards with information about when the next bus will be arriving (UK) or more information about departure times (NL), special fees for students, retirees, and the elderly (HU), and the addition of bus lanes (HU, FR, UK, NL).

Additional efforts by the various countries which were not as widespread will be discussed in the following paragraphs.

There are two ideas that relate to financing public transport. The first example is **traffic charges or congestion charges**. In UK, The London Congestion Charging Scheme charges drivers to enter central London at peak times. The benefits are two-fold: public transport becomes relatively less expensive, and the money goes towards infrastructure improvements (such as bus lanes). The success of the Congestion Charging Scheme highlights the complexity of the interaction of the different types of barriers since no other city in the UK has established a similar scheme. Public consultations in other cities (i.e. Edinburgh) resulted in potential schemes being rejected. Culturally and socially, these cities were not open to a scheme which would limit individuals' freedom to use their car or add to their costs. Politically, the London scheme was implemented because of the determination of an Independent mayor. The political process in Kristiansand, NO has decided to continue the development of traffic charges generally and especially for rush hours. This achieves the goal of reducing traffic by putting a price on the use of cars, and like the Congestion Charge, it raises money for public transport.

The second idea about financing is from NL, where new **bus lanes are subsidized** by the government.

In FR, the Vélib' idea has made **bikes available at self-service terminals**. This effort was approved unanimously as improving mobility in Paris, especially during times (evening) when public transport offerings are less.

Public **awareness and information** campaigns have also been a part of the repertoire of ideas. In CH campaigns for climate change have helped make people aware of how their individual behaviors help or harm the environment. There have also been attempts by SBB (Swiss Federal Rail) to improve awareness through their "Make yourself comfortable" campaign. Kristiansand, NO has also launched **cycling campaigns**; in 2006, about six of the largest firms of Kristiansand were invited to join a campaign for "driving green." The 400 people that participated could choose between a cycling suit or a month pass for the local busses. While about 50% of those who chose cycling continued the new practice three months later, few of those who took the free bus pass continued with public transport.
In a different sense under the topic of information, new inhabitants are always informed of the public transport (park and ride) opportunities in the Groningen area.

UK's attempt at addressing the concerns about **safety** have begun with the introduction of CCTV (video surveillance) on public transport and at stations.

Policy also has a large part to play in overcoming barriers to public transport. In Groningen, NL for example, park and ride is a central part of Groningen's parking policies. The Federal Modal Shift law of CH has changed a great deal of goods transport through the Alps from road transport to rail.

3.3.3 Recommendations for Future Actions and Main Stakeholders

Improving services is a continual process in each country. First, the safety issue could be addressed through good lighting at night and staff to patrol park and ride lots (or stations) at night. Also, giving more info about departure times (and in more developed public transport systems, developing real-time information to inform users of traffic conditions, disturbances, and possible alternatives) helps minimize travel time or annoyance of riders. Park and bike services will be introduced next year to extend beyond park and ride in NL. (FR, HU, NL)

Improving infrastructure is of course related to services and is integral to increased use of public transport. Examples of possibilities include increasing the number and length of lines, improving vehicle quality; building park and ride lots; cooperation with suburban transport companies; and improving frequency of vehicles even further. Interviewees noted that governmental (financial) support is needed to help make the infrastructural improvements. NL interviewees mentioned the need to make sure policies take into account the 10-15% increase in ridership each year so that the high frequency, parking capacity, and free bus lanes can be maintained for the larger number of riders. Finally, using the same principle as Vélib', and Autolib' system will be developed for Paris and inner suburban areas. Government could play a financial role in these developments, and communities could be responsible for the organization and operation of the public transport. Transport and spatial planning authorities also have a role to play, with another goal of speeding up the planning process for special bus lanes for collective transport. (FR , HU, NL, CH, NO)

New forms of consultation processes (the UK focuses on participatory schemes for many projects to ensure suitability for the users) need to be introduced to understand what needs to be done to allow for more social acceptability of politically sensitive initiatives, such as Congestion Charging Schemes.

Another related idea that came out of the UK was a suggestion of more positive ways to encourage people out of their cars and onto public transport. **Talking to people about what they would like for their local area**, and how they would like their local environment to look may enable them to think through what car free zones would do for neighborhoods and communities, rather than just concern about personal convenience.

Changing prices to address true costs is a very important measure in addressing behavioral change. In HU, one step is changing pricing of public transport to reflect trip length. On a larger scale, multiple stakeholders mentioned the need for changes in taxation to address price difference between public transport and driving (and make driving more expensive!). (UK, HU, CH)

Lastly, NGOs, schools, and public transport companies should be involved in continued and increasing efforts in increasing public **awareness of the external costs associated with driving** (pollution, accidents, congestion, etc.). (CH, HU)

Shops and **employers should promote using public transport** services. This could be with the development of a transport bonus which would encourage company employees to use public transport. Public transport companies themselves have a role to play in promoting their services and perhaps reducing prices to increase ridership. (NL, FR, CH)

3.4 Mobility Use- Walking or Biking for Short Distance Trips

The barriers to increased walking and biking (and decreased use of cars) for short distance trips were the focus of the interviews on short distance mobility. CH, HU, and NL conducted interviews in this area, the results of which are presented below.

3.4.1 Main Barriers to Change

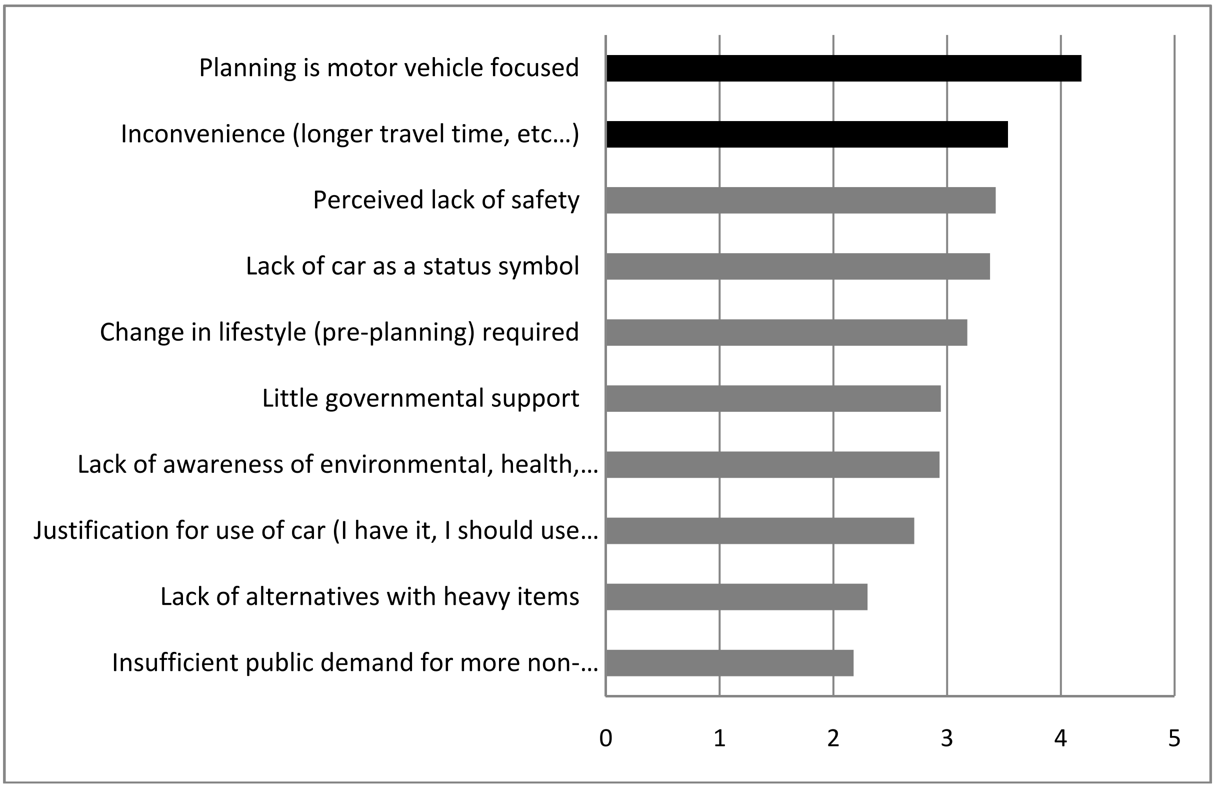

Fig. 19: Average of respondents' ratings of barriers to decreased use of cars for short distance trips (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

Both CH and HU had similar ratings to those shown in the table above. CH interviewees added that people in general have gotten out of the habit of walking. According to the interviewee, a major barrier in HU is that riding bicycles is difficult because there is currently no infrastructure for bicycles. Other barriers include lack of parking at metro stations and lack of park and ride options, as well as the fact that driving a car into the city centre is relatively cheap and easy.

Biking is already quite established in NL as a viable transport option, and is integrated into the city planning in many places. About 33% of short distance trips are undertaken by bicycle. That said, there could still be an increase in the number of trips undertaken by bicycle. The most important barriers that came out of the ratings were city planning focusing on cars, lack of awareness of environmental concerns, inconvenience, and justifying car use because of ownership. About one of the barriers, the need for using a car as a status symbol, the stakeholder remarked that in the Netherlands, it may be necessary to have a car as a status symbol, but not to drive it short distances.

3.4.2 Relevant Past Attempts

Some cities in CH have tried **improving city planning** to lessen car use, and one specific example in NL has done the same. The Dutch city called "Houten" has been developed in such a way that you can move around more quickly by bicycle than by car. In NL, it is not uncommon to put shops all in one location (like a mall) so that it is not necessary to make small trips in between them. Also, there have been bike-only streets developed in NL as well. (CH, NL)

In NL there is an **incentive plan for employees to purchase a bicycle** for commuting.

A new Swiss law requires that one parking lot/space be removed from the city for every new parking space that is created (no net increase in parking). (CH)

Policy for parking, congestion, and air pollution all can affect the use of cars for short distance trips.

3.4.3 Recommendations for Future Actions and Main Stakeholders

All three countries agreed on the need **for city planning to be improved** to encourage walking and biking for short distances. Some possibilities for city planners could be to integrate more bike lanes and pedestrian walkways into city planning, make parking more difficult in the city, but easy to get around by bike, walking, or public transport; nice looking streets are also important! Reduction of speed limits makes sharing the road easier. Ensuring sufficient bike parking and even the possibility of borrowing bike and even electric bikes is another idea. (Vélib in Paris; St.Gallen has free daily bike rentals available at the train station, but it is still quite small scale.) They could also make short distance traffic more difficult for cars by using road-blocks for some streets. (CH, HU, NL)

NGOs can deal with **continued education and awareness** campaigns to make people aware of how they can make changes in their everyday lives (to use cars less, etc.) in order to change habits.

In the proposed **tax per driven kilometer** (Dutch: Kilometertax) the first kilometers could be made significantly more expensive to discourage the use of cars for short distances. (NL)

3.5 Mobility Use- Car-sharing

Car-sharing is a newer idea which has yet to spread to all of the countries that were engaged in the study. Switzerland, Hungary, and France reported on the barriers to this type of transport.

3.5.1 Main Barriers to Change

In FR, the main barriers were lack of communication and information about the subject, attachment to a particular personal car, and the fact that the car-sharing network is not fully developed yet. People sometimes may have heard of car-sharing, but are not sure exactly what it is, or may confuse it with carpooling. Because the network is not fully developed yet, it makes the effort to use car sharing (getting to a car-sharing station) more difficult than having a car on one's driveway.

For CH the most highly ranked barriers for Switzerland correspond to those in the table above. Additional barriers include the fact that access is not as convenient as it could be (which is partly related to the lack of market penetration). Also, a cultural barrier is at play as well: people have an idea of a democratic right to access, which in many people's minds means the right to have access to goods, commuting, etc. at any time (which roughly translates to a personal car waiting on your driveway). Denying this "right" could feel like a denial of democracy. Also, car-ownership is emotional, not just functional. Car-sharing does not fulfill whatever this emotional need may be: freedom, safety, class, etc. (Most of these emotions are linked to advertising.) The emotions/ideas attached to car-sharing, on the other hand, may be associated with the lack of familiarity or information about the topic.

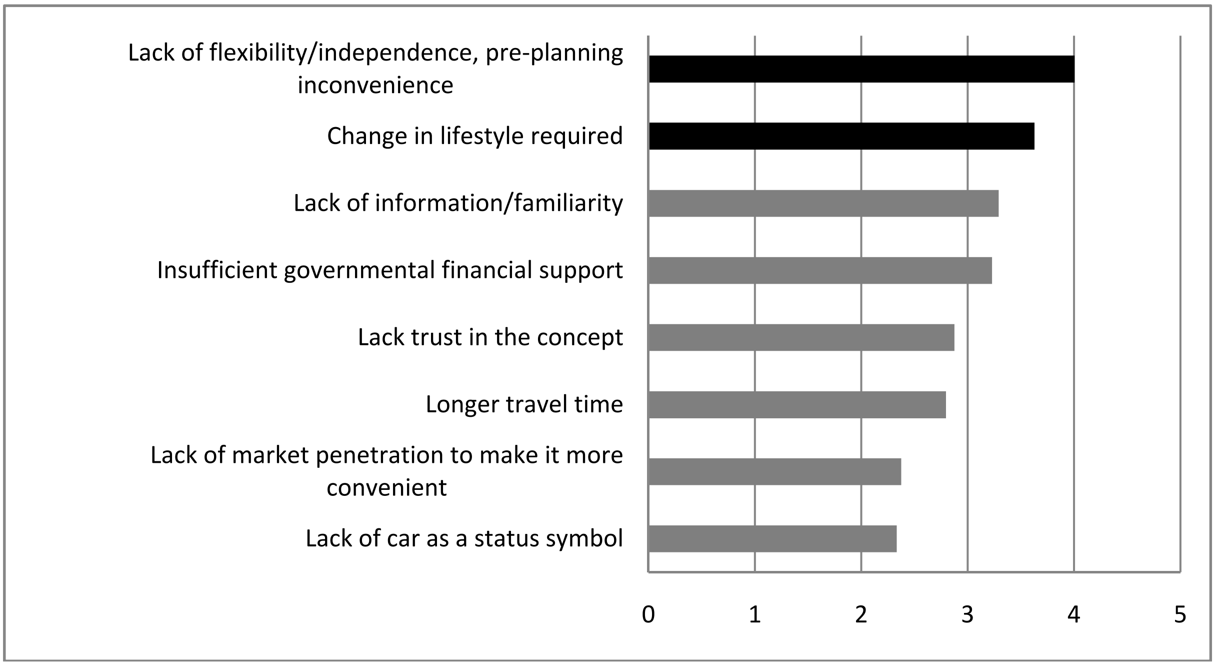

Fig. 20: Average of respondents' ratings of barriers to car-sharing (from 0=no perceived barrier to 5=very important barrier). The highest ranked barriers are black (>3.5); medium barriers are dark grey (2-3.5); and low-rated barriers are light grey (<2).

3.5.2 Relevant Past attempts

The car-sharing idea is still at the beginning stages in FR, and thus past attempts to incorporate this include the development of the label, and car-sharing stations in the Paris area. Car-sharing companies such as Mobility and Okigo have advertising to try to get the word out about the company. (CH, FR)

Increasing locations (network) of available cars has been another ongoing effort. Mobility car-sharing cars are now available at most train stations in CH, which makes the combination of public transport and car-sharing quite convenient.

3.5.3 Recommendations for Future Actions and Main Stakeholders

Improved awareness is needed to make the concept better known. Even in CH where car-sharing is relatively wide-spread, there are many people who are still unsure of how exactly it works. One could use statistics on parking, traffic, etc. to make the benefits of car-sharing more apparent. Car-sharing companies themselves could be responsible for this in the beginning, but if or when car-sharing is accepted as an official government measure, and then public authorities could also be involved in informing the public. **Car-sharing operators should combine their forces** to work together towards the same goal, for example, to make the label better known. Public authorities also have a role to play in communicating/promoting the car-sharing concept since car-sharing could also have benefits for the public. (CH, FR)

Improving accessibility and making the service even more convenient is a goal of car-sharing in Switzerland. One idea that was mentioned was the "Autolib'" idea from Paris, so that car-sharers no longer need to return the car to the same spot they borrowed it from, but rather can return it to any designated car-sharing spot (across town or region for example). This of course would require a higher number of users of car-sharing, which could hopefully be attained by making the services easier (for example through a shift in service. For example, there is a possibility that one would be able to reserve and open a car with a cell phone). Another idea is that manufacturers and rental agencies change the mentality of their business model from thinking of a car as a product, to thinking of it as a service. (CH)

3.6 Summary Use Phase

Regarding use behavior, the main barriers are individual-psychological, knowledge-based, and physical-structural.
Consumers often lack will to change their behavior. Reasons for this are

- too little information on the effect of energy inefficient behavior;
- consumers have priorities other than energy efficiency, which goes together with a need for high level of comfort;
- energy prices are too low (no incentive for more energy efficient behavior);
- the impression that single consumer behavior does not have an influence.

In a couple of countries, individualization is also seen as an important barrier to energy efficiency. People usually have more space to be heated, and regarding cooking, people eat lot of processed food and ready-made meals.

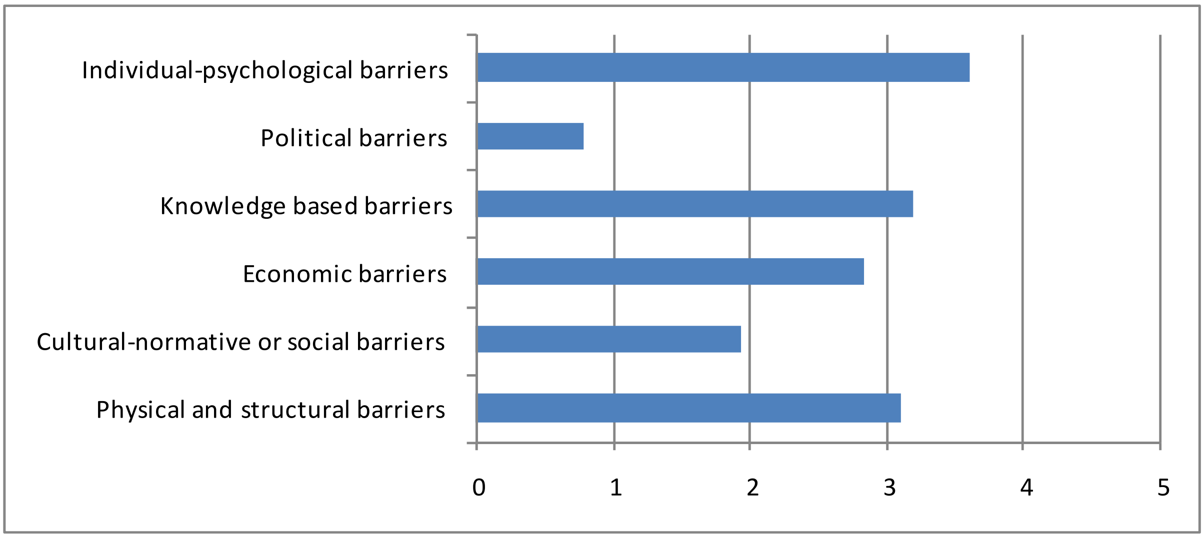

Fig. 21: Average of respondents' ratings of barriers categories perceived in the use phase (from 0=no perceived barrier to 5=very important barrier).

Very few past attempts to overcome these kinds of barriers were mentioned by the interviewees. This may be because, as one respondent remarked, measures at the political level do not work in this area. One can regulate how to build, but one cannot regulate how people behave. An intervention with political regulations or bans, such as the establishment of minimum standards, is difficult in this area.

The majority of interviewees felt that the provision of accurate and up to date information in an engaging format is a fundamental component of consumer behavioral change (i.e. smart meters with real time displays that enable people to count energy and thus help them to adapt their behavior). There is also the feeling that information needs to be provided by the government. Retail companies should do communication campaigns. Also regarding information, the internet could be used for custom-made advice.

4. Conclusion

Differences among participating countries

Overall, in NO, HU, FR and UK, the knowledge-based and the economic barriers are perceived as the most important. The most important knowledge-based barriers differ, however, among the different countries. In FR, they regard information for the public and also skills of professionals as most important. In HU, improving public awareness is perceived as being of highest importance. For that reason, education and capacity building regarding the general public is seen as a key action for the future. In NO, the cost transparency and the knowledge about the availability of certain products (e.g. green power) is the main issue.

Regarding the economic barriers, high initial costs and low energy prices were mentioned as of high importance in all countries. The energy price is seen as a main barrier in many fields, i.e. energy is too cheap for many to change use behavior or to invest in energy saving appliances or measures (including housing and photovoltaic panels). In HU, the lack of financial resources (e.g. getting a new loan for investing in energy efficiency) was mentioned several times. In some countries (CH and HU), investments in the house (refurbishment or photovoltaic) increase the notional rental or resale value of the building, and often the market is not ready to pay the price (especially HU).

One cultural barrier that was interesting to note from HU was not mentioned in any of the other countries: driving a car as a symbol of modern life and freedom that everyone looks forward to.

Regarding the suggested measures, in UK, almost all respondents felt the government needed to fund/encourage a higher and more enhanced level (face-to-face) of advice provision. Many stakeholders indicated that simply engaging consumers wasn't enough to stimulate behavioral change and/or uptake measures. The interviewed stakeholders of UK and also NL expect a lot of governmental steering, whereas they rarely articulate the expectations from individual consumers. Thus, they think that the system around consumers should be changed to make the change for them as easy and as unperceived as possible. In HU, information and awareness raising are seen as the most important measures. HU respondents mentioned several times education and capacity building of the population. This is mostly a smaller issue in the other countries.

Differences between purchase phase and use phase

In the purchase phase, economic barriers seem to have the largest influence, followed by knowledge-based, political, and physical and structural barriers.
The economic barriers can be seen in two ways: inefficient products and the energy they consume are too inexpensive (e.g. poorly insulated houses, inefficient household appliances, or fuel-inefficient cars), and new products or technologies are too expensive (e.g. photovoltaic panels, low energy houses, energy efficient appliances, or hybrid cars). However, a closer looks shows, that this barrier is mainly influenced by knowledge barriers as not known life-cycle costs; political barriers are mainly influenced by insufficiently strict regulations for manufacturers (regarding cars, household appliances and housing) and a ineffective support policy (in the case of photovoltaic); and physical and structural barriers such as the default mix containing rarely green power. Of lower importance are cultural-normative and individual-psychological barriers.

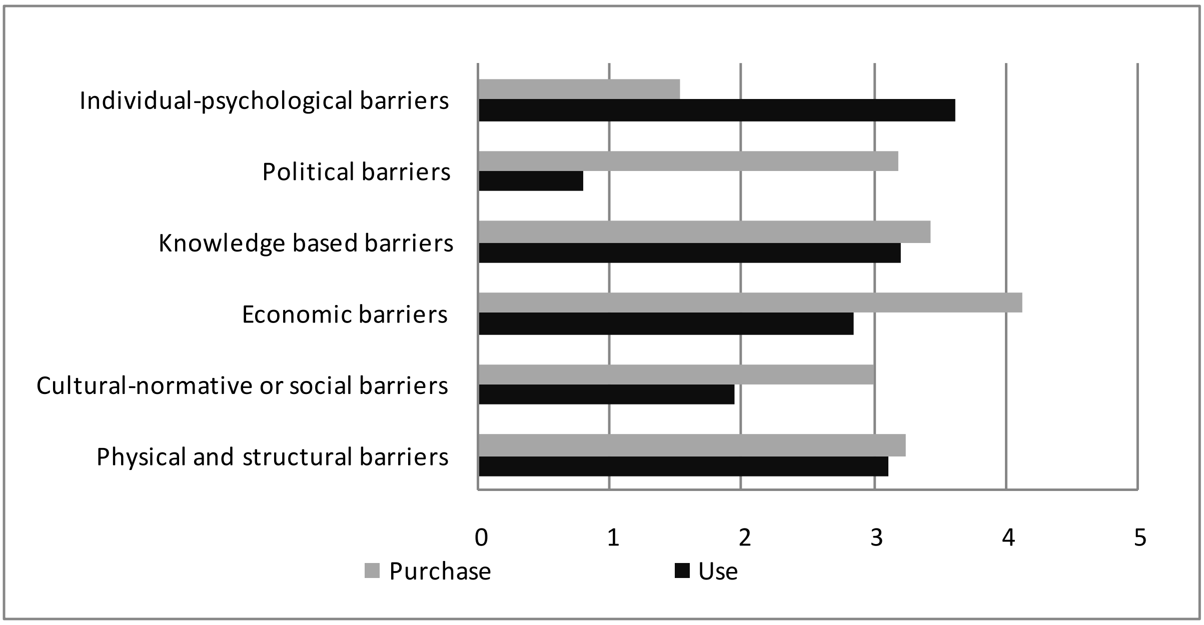

Fig. 22: Comparison of perceived barrier categories in the purchase and the use phase (from 0=no perceived barrier to 5=very important barrier).

As for the use phase, the main barriers fall under individual-psychological barriers. People are not often motivated to make the effort to change from their habitual and comfortable behavior. They value high T-shirt temperature (one can still open the window), tasty, fast prepared and healthy food as well as their private, convenient, individual way of moving around. Consumers are usually not comfortable with changing their habits and patterns of behavior. To buy an energy-efficient appliance once is significantly easier than getting used to using public transport or putting the lid on the pan when you are cooking every time. The lack of willingness to change is reinforced by physical and structural as well as knowledge-based barriers. The insufficient infrastructure is for example an important problem regarding public transport, walking, biking, and market development of car-sharing. Knowledge-based barriers are mainly a problem in regard to the missing energy feed-back: One does not immediately see how much energy is used when cooking or heating.

5. Key Messages for Stakeholders

5.1 Messages for government

The evidence presented in this report suggests that, when formulating **policies**, national, regional and local governments should give great priority to energy efficiency and sustainable energy issues. Ideally, policies should include a more coherent regulatory framework, but also greater financial support. What is more, future attempts should be long-term, and government agencies should clearly communicate their intentions.

The most effective **regulatory devices** suggested by this survey are minimum energy efficiency norms and labels. One such regulation that needs more emphasis is fuel efficiency standards. In the field of appliances, respondents saw the update and reformulation of the mandatory European Energy Label as being highly important in maintaining the trust and legitimacy of the scheme. Further, it was suggested by some interviewees to introduce an energy label for certain not yet labeled product groups (e.g. gas ovens, cooking pans).

Regarding the benefits of **financial support**, it is important to make sure, that there are enough specialists and products are of high quality. This was especially mentioned in the fields of new technologies such as photovoltaics, hybrids and energy efficient refurbishment. Supporting photovoltaics only makes sense if there are enough qualified professionals, and if the panels are of good quality.
Economic incentives also need to be aligned with goals for sustainability as these are not always compatible at present. This is particularly important in enabling more substantial business investment, where risks can be managed more effectively through long-term institutional frameworks. Public-private partnerships offer a key tool to facilitate this kind of infrastructure delivery. In CH, for example, the state has voluntary agreements with the household appliance industry regarding the criteria for the approval of types of devices. Such agreements are viewed as very sensible by the CH respondents.
In many countries, pricing is another area that government has a great deal of control over, through taxes. In the transport sector, there is an argument that costs need to be shifted to include environmental and societal costs which have not been accounted for in the past. This would essentially make driving or driving inefficient cars a much more expensive choice and would begin to open up more sustainable options in transport use. In terms of tax reductions, it may be useful to create a gradation scheme so that the *most* efficient cars are rewarded more than average efficient cars. The bonus-malus scheme has had mixed reviews, and perhaps using the idea and improving upon it would be a next step. Charges on driving are being considered by multiple cities as possibilities for reducing congestion, pollution, and improving public transport, among other things as well. This would be another consideration that local governments should seriously think about.

Local governments need to build up effective capacity to implement national and regional policies, regulations, and to control the appropriate allocation of subsidies. They have an important role to play in promoting efficient behaviors, for example by providing free parking for efficient cars or hybrids. Public transport infrastructure needs additional development in each country to provide for a comfortable, convenient, and cost-effective alternative to driving. Examples of various infrastructural developments include increasing frequency of departures, provision of real-time information about departures, and development of park-and-ride facilities, just to name a few.

There is also a need **for city planning to be improved** to encourage walking and biking for short distances in many cities throughout Europe, and there are numerous examples of cities to look towards for examples of how to do this; the town of Houten in NL is just one example. This can be supported by local or central governments, as well as by schools and universities that are teaching city planning.

The interview data additionally suggests that mechanisms for stakeholder education need to be emphasized and encouraged. Education is highly relevant regarding the communications which take place between professionals (especially architects, installers and salespeople) and citizens, where in particular key groups including children and homeowners needs to be prioritized. Schools also have a role to play in increasing awareness regarding the external costs associated with driving, and in spreading greater awareness of the benefits of walking, biking, and taking public transport, the importance of saving energy, etc. This could be done in conjunction with greater input from NGOs as well.

5.2 Messages for NGOs

Interview data suggested that, in regard to policy design, NGOs (together with research institutions) have an important role **providing expertise, information and capacity building** for public institutions and citizens. Regarding sustainable mobility for example, NGOs could have a greater role in changing individual habits by encouraging consumers to look at the advantages of efficient cars, increasing public awareness of the external costs associated with driving (pollution, accidents, congestion, etc…), and campaigns to make people aware of how they can make changes in their everyday lives (to use cars less, etc). Greater discussion on what people would like for their local area and how they would like their local environment to look, may also enable citizens to think through, for instance, how car free zones could benefit neighborhoods, as opposed to current preoccupations with traveling arrangements which are more about personal convenience.

5.3 Messages for Business

Interview data also suggests that business players could play a greater role in **promoting the production and sale of energy efficient products**. It was argued that they could do this through attracting consumers' attention, good marketing approaches, product design, and provision of life-cycle cost. Product manufacturers should focus on energy efficient products. Car manufacturers for example, have a role to play in focusing more attention on hybrids, increasing the product line to include smaller, cheaper options, and encouraging technology development so that in the coming years production can become less expensive. Perhaps another option (signposted by a few interviewees) for making hybrids more popular is to exclude development costs in the final price of hybrids'. It was also suggested that, those responsible for selling the cars (whether it be manufacturers or dealerships), could provide new crediting schemes to make hybrids more attainable for individuals who are unable to make the initial investment. It was also felt by some interviewees that car-dealerships should also play a greater role in promoting wider purchases of fuel-efficient and hybrid cars.

It was also felt that companies could play a greater role in **encouraging employees** to engage in more energy efficient behaviors. In regard to transport, for instance, they could promote the use public transport or walk or bike to work by having a bonus (way to get a cheaper bike, cheaper tickets, or generally just a slightly higher salary for not driving to work). Companies could also implement their own measures in these regards, in order to be a role model for their employees. For example, they could focus on developing more energy efficient heating, buy green power, or they could install solar panels on their own premises.

Shops and retail outlets could also take greater responsibility for ensuring, that their salespeople are competent regarding appropriate energy advice to customers. Also, they could promote public transport, perhaps through special offers for customers using public transport.

Some of the interview data argued that **power utilities** carry a lot of weight regarding some of the structural issues outlined above. It was suggested that public transport companies also have a role to play in promoting their services and perhaps reducing prices to increase demand and use. Several interviewees also argued that public transport companies have a role to play in increasing awareness of the external costs that are now associated with private car use. It was also felt by some interviewees that car-sharing companies needed to continue/make efforts to publicize the concept of car-sharing concept better, and to make the benefits of it more apparent through advertising. In situations where there are multiple car-sharing companies for instance, it was suggested that car-sharing operators could work together more effectively in order to reach the same goal. It was suggested that it was also the responsibility of these companies to expand the car-sharing network and to make their services more accessible and convenient. Following these efforts, it was thought that it may be possible for individuals in the political sphere to also support car-sharing as a viable alternative to car-ownership because of the great possibility of combining it with public transport.

Annex

Information about Stakeholder Interviewees

- Interviewees in the Area of Domestic Energy Use

Photovoltaics

- Mr. Bokhoven, ConSolair, Netherlands
- William Baker, Consumer Focus, UK
- Michael Harrison, Department for Energy and Climate Change, UK
- Derek LickorishEDF Energy, UK
- Patrick Caiger-Smith, Green Energy Options, UK
- Michael Meacher, MP, former Cabinet Minister for the Environment, UK
- Matthew Wright, the Energy Saving Trust, UK
- Trewin Restorick, Global Action Plan, UK
- Naplopo (Producer of Solar collectors), Hungary
- KHEM (Ministry of Transport, Telecommunication and Energy), Hungary
- MFB (Hungarian Development Bank), Hungary
- Greenpeace, Hungary
- ENSAPVS (National High School of Architecture), France
- Harry Künzle, Energy Commissioner, Switzerland
- David Stickelberger, Swissolar (Swiss Solar Association), Switzerland
- Stefan Nowak, NET Nowak Energie & Technologie AG (Consulting firm in the area of renewable energy specializing in photovoltaics), Switzerland
- Giuse Togni, Energy consultant & Member of the Advisory Board for Edisun Power Europe AG, Switzerland
- Patrick Hofstetter, Chief of Climate Policy division of WWF Schweiz, Switzerland
- Andreas Luzzi, Professor, Director of the Institute SPF of HSR Rapperswil, Switzerland
- Andreas Haller, Ernst Schweizer AG, responsible for solar energy systems, Switzerland
- Christian Schaffner, Electricity Supply Section at BFE (Swiss federal office foe Energy), Switzerland
- Robert Horbaty, "Suisse Eole" (Swiss Wind Association) & ENCO Energie-Consulting AG, Switzerland

Green Power

- William Baker, Consumer Focus, UK
- Michael Harrison, Department for Energy and Climate Change, UK
- Derek LickorishEDF Energy, UK
- Michael Meacher, MP, former Cabinet Minister for the Environment, UK
- Matthew Wrightthe Energy Saving Trust, UK
- Trewin Restorick, Global Action Plan, UK
- MVM (Hungarian Power Companies), Hungary
- MEH (Hungarian Energy Agency), Hungary
- Greenpeace, Hungary
- ELMŰ-ÉMÁSZ (Budapest Electricity Companies-North-Hungarian Electricity Works), Hungary
- ENERCOOP (Energy cooperative), France
- Harry Künzle, Energy Commissioner, Switzerland
- Robert Horbaty, "Suisse Eole" (Swiss Wind Association) & ENCO Energie-Consulting AG, Switzerland

- Patrick Hofstetter, Climate Policy division of WWF Schweiz, Switzerland
- Cornelia Brandes, Brandes energie - Naturemade (green power labeling), Switzerland
- Christian Schaffner, Section for electricity supply at the BFE (Swiss federal office foe Energy), Switzerland
- Paolo Frankl, Head of Renewable Energy Unit, IEA, France
- Karl Kellner, Advisor, Directorate-General Transport and Environment, European Commission, Belgium
- Martin Eibl, Project Officer, Executive Agency for Competitiveness & Innovation (EACI), Unit Energy Efficiency, Belgium

Low Energy Housing

- Mr. Arendonk, Sustainable Financial Advice, Netherlands
- Mr. Appers, Triodos Bank, Netherlands
- John Slaughter, Homebuilders Federation, UK
- Derek Lickorish, EDF Energy, the UK
- Patrick Caiger-Smith, Green Energy Options, UK
- Energia Klub (Energy Club), Hungary
- FŐTÁV (Budapest District Heating Works), Hungary
- KVVM (Minsitry of Environmnet and Water Management), Hungary
- LOGICONFORT (Green Home Builder), France
- Skanska, Norway
- GAIA architects, Norway
- Charles Müller, product manager hypothecary credits and building loan, Kantonalbank St.Gallen, Switzerland
- Benno Zurfluh, HLK- engineer bureau ZURFLUH, Switzerland
- Urs Peter Menti, Institute for integral building services engineering & certificate authority for MINERGIE-P, Switzerland

Energy Efficient Refurbishment

- Mr. Van Rijsbergen, Woonbond, Netherlands
- William Baker, Consumer Focus, UK
- Patrick Caiger-Smith, Green Energy Options, UK
- Michael Harrison, Department for Energy and Climate Change, UK
- Derek Lickorish, EDF Energy, UK
- Michael Meacher, MP, former Cabinet Minister for the Environment, UK
- KHEM (Ministry of Transport, Telecommunication and Energy), Hungary
- Energia Klub (Energy Club), Hungary
- FŐTÁV (Budapest District Heating Works), Hungary
- Les Amis de la Terre (Environmental NGO), France
- Norwegian Society for the Conservation of Nature/Friends of the Earth Norway (FoEN), Norway
- Charles Müller, product manager hypothecary credits and building loan, Kantonalbank St.Gallen, Switzerland
- Benno Zurfluh, HLK- engineer bureau ZURFLUH, Switzerland
- Urs Peter Menti, Institute for integral building services engineering & certificate authority for MINERGIE-P, Switzerland
- Beat Kämpfen, architect, Switzerland
- Franz Beyeler, MINERGIE, Switzerland

Heating Behavior

- Mrs. Salverda, Milieu Centraal, Netherlands
- William Baker, Consumer Focus, UK
- Patrick Caiger-Smith, Green Energy Options, UK
- Michael Harrison, Department for Energy and Climate Change, UK
- Derek Lickorish, EDF Energy, the UK
- Michael Meacher, MP, former Cabinet Minister for the Environment, UK
- Energia Klub (Energy Club), Hungary
- FŐTÁV (Budapest District Heating Works), Hungary
- KVVM (Minsitry of Environmnet and Water Management), Hungary
- ADEME (French Public Energy Management and Environment Agency), France
- The Energy Efficient unit in the Oslo municipality, Norway
- ENOVA, National Institution for Energy Efficiency, Norway
- Charles Müller, product manager hypothecary credits and building loan, Kantonalbank St.Gallen, Switzerland
- Benno Zurfluh, HLK- engineer bureau ZURFLUH, Switzerland
- Urs Peter Menti, Institute for integral building services engineering & certificate authority for MINERGIE-P, Switzerland
- Bosco Büeler, building engineer, Switzerland

- Interviewees in the Area of Household Appliances

Purchase of Appliances

- Mrs. Salverda, Milieu Centraal, Netherlands
- Mr. Otten, BCC, Netherlands
- Martyn Webb, Defra Market Transformation Programme, UK
- Tara Garnett, the Food Climate Research Network, UK
- John Aston the Environmental Marketing Director of Phillips Lighting, UK
- Ökoszolgálat (Ecoservices), Hungary
- GIFAM (Appliances manufacturers federation), France
- BOSCH-SIEMENS (Appliances manufacturer), France
- SIFO, Norway
- Fabian von Selve, Product Manager of Kuhn Rikon Switzerland, Switzerland
- Jürg Nipkow, ARENA (Association for Energy Alternatives) & S.A.F.E. (Swiss agency for efficient energy use), Switzerland
- Matthias Gysler, Energy Policy Section at the BFE (Swiss federal office for Energy), Switzerland
- Giuse Togni, S.A.F.E (Swiss agency for efficient energy use), Switzerland
- Annete Reiber, Greenpeace Switzerland, Switzerland
- Rudolf Bolliger, Energy Agency for Electric Appliances (eae) & Industrial Union for Electric Appliances (FEA), Switzerland
- Martin Eibl, Project Officer, Executive Agency for Competitiveness & Innovation (EACI), Unit Energy Efficiency, Belgium

Use of Appliances

- John Aston the, Environmental Marketing Director of Phillips Lighting, UK
- Ökoszolgálat (Ecoservices) ,Hungary
- CLCV (Consumer NGO), France
- Rudolf Bolliger, Energy Agency for Electric Appliances (eae) & Industrial Union for Electric Appliances (FEA), Switzerland
- Andrea Jenny, primary school teacher and freelance worker at the VSE (Association of Swiss Electricity Businesses), Switzerland
- Annete Reiber, Greenpeace Switzerland, Switzerland

- Fabian von Selve, Product Manager of Kuhn Rikon Switzerland, Switzerland
- Jürg Nipkow, ARENA (Association for Energy Alternatives) & S.A.F.E. (Swiss agency for efficient energy use), Switzerland

- **Interviewees in the Area of Mobility**

Public Transport

- Mr. Van Huissteden, Netherlands
- Mr. Stoker, OVBGD, Netherlands
- Phillip Stamp, Behavioural Change Unit, Defra, UK
- Peter Lipman, Policy Director Sustrans, UK
- BKV (Budapest Transport Company), Hungary
- VEKE (Urban and Suburban Transit Association), Hungary
- KTI (Transport Research Institute), Hungary
- KHEM (Ministry of Transport, Telecommunication and Energy), Hungary
- City of Paris (local), France
- Ministry of Ecology, Energy, Sustainable Development (national), France
- ATP, Norway
- Peter de Haan van der Weg, Institute for Environmental Decisions ETH, Switzerland
- Benedicta Aregger, Department of the Environment, Transport, Energy and Communications (UVEK), Switzerland
- Aline Trede, Vice President of Green Party of Switzerland, Switzerland
- Gery Balmer, Bundesamt für Verkehr (Swiss Federal Office of Transport), Switzerland
- John Adams, UCL, UK
- Dudley Curtis, European Federation for Transport and the Environment, Belgium

Short Distance

- Mr. Schrijver, TNO, Netherlands
- Peter Lipman, Policy Director Sustrans, UK
- KTI (Transport Research Institute), Hungary
- BKV (Budapest Transport Company), Hungary
- VEKE (Urban and Suburban Transit Association), Hungary
- Klimaveien – The Climate Road-The campaign, Norway
- Peter de Haan van der Weg, Institute for Environmental Decisions ETH, Switzerland
- Aline Trede, Vice President of Green Party of Switzerland, Switzerland
- Michael Rytz, VCS (Verkehrs-Club der Schweiz)- responsible for traffic safety projects, Switzerland

Car Sharing

- Peter Lipman, Policy Director Sustrans, UK
- KTI (Transport Research Institute), Hungary
- VEKE (Urban and Suburban Transit Association), Hungary
- KHEM (Ministry of Transport, Telecommunication and Energy), Hungary
- OKIGO (car sharing company), France
- Peter de Haan van der Weg, Institute for Environmental Decisions ETH, Switzerland
- Conrad Wagner- Mobility Systems, co-founder, Switzerland
- Gery Balmer, Bundesamt für Verkehr (Swiss Federal Office of Transport), Switzerland
- Peter Mulheim- Manager of Mobility Support AG, Switzerland

Energy Efficient Cars and Hybrids

- Toyota Hungary, Hungary
- MGE (Association of Hungarian Car Importers), Hungary
- Norsk Petroleumsinstitutt - The Norwegian Petroleum Industry Association, Norway
- Mr. Hablé, Ministery of Transport, Netherlands
- MGE (Association of Hungarian Car Importers), Hungary
- Toyota Hungary, Hungary
- AVERE (NGO for the HEV development), France
- Peter de Haan van der Weg, Institute for Environmental Decisions ETH, Switzerland
- Aline Trede, Vice President of Green Party of Switzerland, Switzerland
- Andreas Burgener- Director, Auto-schweiz, Switzerland
- Moritz Christen- Verkehrs-Club der Schweiz, responsible for individual motorized transport issues, Switzerland
- Hannes Gautschi- Director Service and Training, Toyota, Switzerland
- Felix Reutimann, Federal Office for the Environment (Bundesamt für Umwelt), Switzerland
- Dudley Curtis, European Federation for Transport and the Environment, Belgium
- Günter Hörmandinger, Unit C.3: Clean Air and Transport, Environment Directorate-General, European Commission, Belgium