HARP Project – labelling residential heating appliances

Several studies confirm a lack of consumer awareness regarding the energy inefficiency of their heating system. This is how HARP (Heating Appliances Retrofit Planning) came about, a project financed by the European Union through the Horizon 2020 framework, in which five countries participate: France, Germany, Italy, Portugal and Spain. Its aim is to encourage the renewal of old and inefficient boilers through the use of energy labelling.

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Heating and cooling currently account for half of the EU energy consumption, a large part of this energy wasted since 65% of the installed stock of heaters in Europe is old and inefficient. Moreover, within the residential sector (i.e. European households), space heating and hot water supply represent 85% of the energy consumption , accounting for a significant share of the average individual's carbon dioxide emissions and 30% of the EU overall carbon dioxide emissions[1].

According to recent data from EHI (European Heating Industry), the EU space heating stock accounts roughly 126 million installed appliances, 60% of which are over 15 years old and likely performing as a C or a lower energy class, demonstrating the low energy efficiency performance of most of the installed heating stock. Furthermore, boilers average replacement rate in the EU is low, currently only 4% per year, which aggravates the problem. This low replacement rate could be explained by the lack of awareness among homeowners and building managers as well as the complexity of the diffusion of innovation's process.

Consequently, the energy efficiency of heating and cooling installations deserves specific attention, given that space and water heating represent the largest share in energy

[1] Ecofys. (2016). "EU pathways to a decarbonised building sector" How replacing inefficient heating systems can help reach the EU climate ambitions. https://www.bdh-koeln.de/fileadmin/user_upload/Studien/Ecofys_study_final_201604013.pdf

consumption in buildings, the highest potential for efficiency gains, while being essential for the transition towards more sustainable and decarbonised solutions[2].

Within this context, the HARP starting point was the definition of the Theory of Change Model, which analysed consumer's behaviour towards the adoption of new heating technologies. The Model validated the results from previous studies and experiences which identified that the 'indicative energy label for existing heating systems' is a trigger for consumer action. Additionally, the key points to address consumers concerns and the most relevant communication means to convey the energy-efficient heating message to the consumer were also identified in the referred Theory of Change Model.

An academic study[3] in 2014 surveyed homeowners in Italy, Spain, Belgium, France, Germany and the UK asking consumers how they would react if their boiler was labelled with a low energy efficiency class. 24% of respondents said they would replace their existing boiler as soon as possible or within two years at most, which demonstrates a lack of consumer awareness of the inefficiency of their actual heating system.

This evidences the importance of reliable and quantified information , offered to the consumer in a user-friendly manner. Such information can lead to an increase of trust in the heating market and to an effective change in consumer behaviour. Moreover, the translation of technical information in an easy to understand way, avoiding linguist diversity which is the energy label main concept, is an important asset for the engagement of consumers.

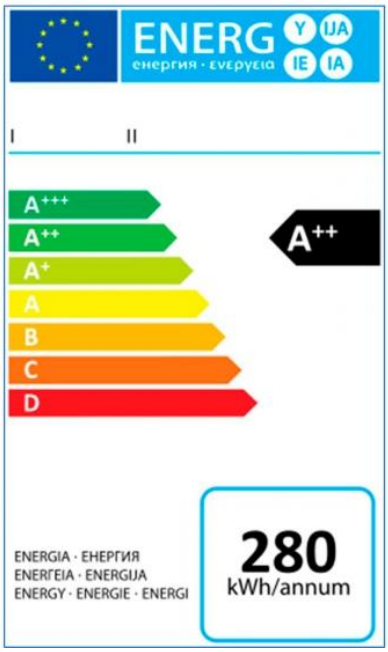
[2] European Comission. (2018). A Clean Planet for all A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy. Retrieved from https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf

[3] Wellkamp, D. (2017) Ein Beitrag zur Einschätzung der Konsequenzen der neuen Ökodesignanforderungen und Energieeffizienzkennzeichnungspflicht von Heizanlagen [translated: A contribution to the evaluation of the impacts of ecodesign requirements and mandatory labelling of heating installations] (unpublished doctoral dissertation), TU Dresden: Dresden.

Methodology

With the aim of encouraging the renovation of old and inefficient boilers through the use of energy labelling, HARP has developed its own methodology, which can be classified in 5 phases:

1. **Awareness**: this is the first stage of the process and it is key. There is a need to capture the attention of consumers and make them understand the opportunity of a change in heating and domestic hot water equipment. The fundamental channels are direct contact through campaigns (material, videos, seminars, social networks) and indirect contact through professionals (who will be given specific training), and via public policies.
2. **Quantification**: the labelling of the current heating system gives the consumer a clearer message on how inefficient is the currently installed heating system . It also allows the consumer to easily compare the efficiency of the existing boiler with the newer options on the market and quantify the potential savings once the old heating system is replaced with a more efficient solution.
3. **Market offer**: showing consumers the available heating technologies on the market, both conventional and renewable, the main characteristics and indicating the energy class of the new heating solution.
4. **Benefits**: presenting consumers the potential for energy savings, reduced maintenance costs, avoided CO_2 emissions and other additional benefits (improved comfort, reduced noise, improved air quality, independence of energy prices, increased value of the house, etc.).
5. **Motivation**: the last step puts the consumer in direct contact with the professionals that can further support the process of acquisition of a new heating system, making the consumer also aware of the existing benefits, such as public financing and incentive schemes, available at national level, and that can provide an extra push to the replacement.



Example of the heating energy label for new heating and domestic hot water appliances

Labelling available for everyone: an online application

To execute this methodology, HARP has an online application with two different versions. The first version, aimed at individual consumers, allow users to get information easily and directly assess from their homes the energy class of their existing heating appliance. This shall be done without major inconvenience and without having to spend time or resources.

The second version is aimed at professionals and is more advanced as it offers more detailed and technical information, so that experts can explain this type of data to consumers during maintenance visits or in the event of possible breakdowns. The application allows to standardize the proposed methodology for any type of user, giving a common, coherent and truthful information in the five countries where the project is carried out (France, Germany, Italy, Portugal and Spain).

Once the required data regarding the installed heating appliance has been inserted, the application generates an energy efficiency label similar to the one already found on new appliances. In addition, the application offers a new proposal for optimal and more efficient heating through the following indicators:

- The application indicates which **technology** among those currently available on the market might be the optimal one for the consumer's specific heating needs, taking into consideration the house characteristics and the consumer's needs and preferences in terms of additional benefits considered when replacing a heating appliance.
- The indicative **power** needed to use the new technology.
- The **energy efficiency class** achieved by the proposed new technology.
- The indicative **investment** required to change the heating system.
- The estimated **annual energy savings** as a result of the change of system.
- The estimated **annual economic savings** due to the use of a more efficient technology.
- Estimation of **annual CO_2 emissions savings** from the change of heating.
- Estimated energy, economic and CO_2 emissions savings throughout the expected lifetime of the new heating appliance.
- **Payback** or term in which the initial investment is recovered by the savings obtained.
- The **Net Present Value** of the investment

Objectives and scope

The HARP project aims at raising consumers awareness to new heating solutions that would accelerate the replacement rate of these types of equipment and significantly reduce energy consumption in existing buildings by exploiting the energy label as a privileged support decision tool for the consumer.

In this regard, since professionals are the preferred information channel for consumers considering the replacement of their heating system, the HARP project will target their competence development via training activities. In fact, 1000 professionals are expected to be trained across the participating countries: France, Germany, Italy, Portugal and Spain.

For a system replacement the range of options might be extense, with variations depending on the type of system (for instance hot water heating and/or space heating), the demand profile of the consumer, or the geographical region. Under these contextual realities, the project will deliver a toolbox aimed at professionals (namely energy experts, installers, system designers, retailers), explicitly providing a training programme on how to interact with the consumer and promote efficient heating solutions in the consumer advisory process, using the HARP resources and online app. Moreover, experience and best-practices gathered from the roll-out of activities with professionals and consumers will be shared.

Through trade associations and impartial organizations, professionals will be reached out to, as an essential element in bringing dynamism into the heating market. It is also foreseen to support experts reaching out to consumers and providing consumers with the necessary tools that aid their decision-making process.

The HARP project started in May 2019 and gathers a consortium of 18 partners, with long-standing expertise in relevant work areas, involving stakeholders from the heating industry sector such as EHI (European Heating Industry), Solar Heat Europe, Assotermica (Italian Heating Association) and Uniclima (French Heating Association); consumer organizations such as DECO (Portuguese Consumer Defense Association), OCU (Spanish Consumer Defense Association) and Energies 2050 (French ONG); energy consultant companies such as Creara (Spain), R2M (Spain), Trenkner (Belgium) and EURAC (Italy); universities such as Universidade Nova de Lisboa and Universidade do Minho; and national energy agencies such as DENA (German National Energy Agency), ENEA (Italian National Energy Agency) and the project leader, ADENE (Portuguese National Energy Agency).

For further information, visit HARP website.