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EHI Position on the review of the Energy Performance of Buildings Directive

To increase the energy performance of buildings in Europe, the review of the EPBD should increasingly **focus on the old and inefficient European building stock.** In particular, the following actions may prove of value to impact the energy efficiency of existing buildings:

- Increase the awareness of consumers about the energy performance of their home and heating system;
- Set a framework for consumers to make informed decisions on how to meet their heating needs;
- Harmonise the minimum energy performance requirements and the calculation methodology;
- Tap into what matters to consumers, not prescribe specific measures;
- Recognize the savings' potential of the heating system as a whole.

Introduction

Since its entry into force, the Energy Performance of Buildings Directive (EPBD) has been successful in setting higher standards of energy efficiency for new buildings. Unfortunately, the same cannot be said about the EPBD's ability to transform the old and inefficient European building stock, even though the potential for energy saving in existing buildings is widely recognized. Hence, boosting renovation rates of the European building stock should be the first priority of the EPBD review.

Improving the energy performance of existing buildings and modernizing their heating systems go hand in hand. Space heating and hot water production account for 85% of a building energy needs, therefore accelerating the replacement of Europe's inefficient heating stock should be a key objective.

This position paper presents the heating industry view on the revision of the EPBD, and suggests measures which we believe would be useful to deliver an improvement in the efficiency of Europe's buildings.

Increase the awareness of consumers about the energy performance of their home and heating system

The first step towards increasing the energy performance of a building is realizing that your building is not energy-efficient. Raising awareness about the inefficiency of installed heating stock is therefore critical. There are some best practices across Europe that have led the way. The review of the EPBD will greatly benefit from incorporating these best practices.

A. Raising awareness practices

Energy labelling of installed heaters: this initiative, introduced by the government of Germany in January 2016 aims at increasing the awareness of consumers of the (in) efficiency of their own heating appliance.[1] By taking advantage of the regular boiler safety inspections, the installer/chimney sweeper informs consumers about the efficiency class of the installed boiler, and recommends how to increase it. To rate the heater, he/she uses the methodology of the Energy Labelling Regulation[2].

B. Mandatory inspections

To increase the awareness about the energy performance of the heating system in buildings, EHI also advocates to introduce **mandatory regular inspections** of the heating system as a whole. The efficiency of the heating system depends on the optimal design and adjustment of all components of the system. Regular inspections can ensure that the heating system maintains its optimal functioning level throughout its life time. Such inspections could go beyond only assessing the efficiency of the heat generator, control system and circulation pump(s), but also include the optimal adjustment of heat emitters (e.g. the efficiency of radiators) in the analysis. Strong enforcement mechanisms and the availability of incentives for regular inspections and labelling will boost the awareness of consumers about the efficiency of their home and heating system.

C. Fiscal incentives raising awareness of energy efficiency

- The 2016 Budget Law of the Italian government introduced a new incentive to foster consumer awareness about the energy consumption of their heating and cooling systems. To achieve this, a tax rebate was offered for the purchase and installation of appliances that allow for the **remote control of heating** and cooling systems via

[1] EHI (2016) 'News: Germany launches the energy label for installed heaters', available at: http://www.ehi.eu/news-item/germany-launches-energy-label-installed-heaters

[2] Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU.

smartphones. Such remote-controlled appliances can offer a stepping-stone to transition – at a later stage – to so-called 'smart' appliances, which can communicate with others appliances and can adjust their functioning through external input via the internet.

- **London Boiler Cashback Scheme**: The Mayor of London introduced this incentive scheme in February 2016. Through an easy-to-understand five steps scheme, home owners can self-evaluate the performance of their boiler. If eligible, they will receive a £ 400 cashback voucher to replace their old and inefficient boiler with a condensing gas or oil boiler or a renewable/low carbon heating technology.[3]

D. Energy Performance Certificate more meaningful to consumers

The Energy Performance Certificates (EPC) can usefully complement the information to consumers, provided the EPCs speak more directly to their lived experiences. To better realize the potential of EPCs, the EPBD review needs to insist on the following measures:

- To bring the information contained in the EPCs closer to the consumers, information about the pay-back time of specific improvements to a building's heating system will be more useful for consumers than energy consumption expressed in terms of, for example, a building energy requirement per square meter, per year.
- Tailor-made recommendations to improve the energy performance of a building with adequate support schemes should be included in the EPC.

Such an approach – i.e. (1) labelling the installed heating stock (2) mandatory inspections of heating systems (3) provision of financial incentives and (4) meaningful Energy Performance Certificates, will be a crucial first step to push consumers to invest in better energy performing buildings.

Set a framework for consumers to make informed decisions on how to meet their heating needs.

The EPBD should continue to remain focused on outcomes, not on promoting specific technologies or select heating and cooling solutions.

Why? Because national and local conditions determine the optimal path to efficient and ultimately decarbonized heating. There are large differences in climate, building structure, population settlement patterns, local availability of energy sources and energy demand across European countries. But also, the available budget for home improvements or greater trust in one solution over another influence consumers' decisions. Consumers must be able to afford the investments that are required to make their heating systems more efficient.

Last but not least, there is currently no comprehensive data set, which could back one single technology in a long-term scenario. There are too many unknown parameters about how the transition to a decarbonised European energy system will evolve over the coming decades (e.g. the load management of the electricity grid with a growing share of variable renewables, the future of biomass, the role of building insulation or the rate of new-builds).

A UK study[4] on different pathways to meeting the UK climate goals for 2050 in the building sector analyzed three scenarios, including: *electrification of heat and heat networks* versus a *balanced transition* with the use of existing infrastructure and a mix of available low carbon and renewable technologies.

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[3] More information on this London Boiler Scrappage Scheme: https://www.london.gov.uk/what-we-do/housing-and-land/improving-quality/london-boiler-cashback-scheme#Stub-124173

[4] Delta Energy and Environment Ltd., final report *2050 Pathways for domestic heat (2012). Available online at: http://www.energynetworks.org/assets/files/gas/futures/Delta-ee_ENA%20Final%20Report%20OCT.pdf.pdf accessed on 11/4/2016.*

The study result indicates that a "*balanced transition* can be achieved with less government intervention (and at less cost) than *Electrification & Heat Networks*, while achieving 90% (rather than 96%) carbon reduction from today to 2050"[5].

Where technologies can use existing infrastructure, significant investments in new (grid) infrastructure and decommissioning of existing networks is avoided[6]. As a result, the ability of the consumer to finance the costs of retrofitting is enhanced.

In order to reap the benefits offered by the wealth of low carbon and renewable heating and cooling technologies, the review of the EPBD should set a stable, but open European framework, which stimulates research and development. In such a way, industry receives an incentive to innovate and finds the technologies of tomorrow.

Harmonise minimum energy performance requirements and calculation methodology

The current EPBD does not introduce a calculation methodology to measure the energy performance of buildings. This has led to a patchwork of different minimum requirements within the EU, with varying building performance standards.[7] This presents a major obstacle for companies who want to market their building-related products in different EU Member States and possibly confusion to consumers.

And although the approach and methodology should be harmonised, the actual requirement levels can, and should, be tailored to climatic and construction circumstances. For example, the primary energy demand cannot be the same in the South and North of Europe, due to different climates. Establishing a European range of different climate zones as implemented under the Ecodesign Directive (2009/125/EC) will allow to take into account different climatic conditions throughout the EU.

A more harmonised approach to minimum energy performance requirements will serve a threefold purpose: (i) help ensure a common level of minimum energy efficiency throughout Europe, (ii) avoid trade barriers inside the Single European market and (iii) stimulate investment in the research and development of efficient European technology solutions.

Tap into what matters to consumers, not prescribe specific measures

The EPBD Directive review should focus on *motivating*, not obliging.

Research shows that consumers are not exclusively motivated by energy savings, but that other concerns are driving their choice to invest in house renovations, such as ensuring *comfort* levels, home security[8] and external noise reduction as well as securing the *value* of their property.[9] Tapping into what matters to consumers is therefore important in order to move them towards making energy efficient choices.

Instead, obligations of very specific building refurbishment requirement have proven counterproductive, according to the recent experience in some EU Member States (e.g. in

[5] Delta Energy and Environment Ltd., Ibid, page 131.

[6] Delta Energy and Environment Ltd., final report *2050 Pathways for domestic heat. (2012), p.132.*

[7] For example, select Member States have set varying values of renewable energy that should be integrated in the household. Other Member States do not set a concrete value for renewable energy in buildings, as long as the primary energy need does not go over a certain value (e.g. 50kWh/m^2/year) (Ecofys (2015). 'Assessment of cost optimal calculations in the context of the EPBD (ENER/C3/2013-414) Final report', available at https://ec.europa.eu/energy/sites/ener/files/documents/Assessment%20of%20cost%20optimal%20calculations%20in%20the%20context%20of%20the%20EPBD_Final.pdf *accessed on 11/4/2016*)

[8] The latest smart temperature control systems can integrate home security features (e.g. sensors to detect glass break, carbon monoxide or smoke).

[9] Velux (2015) European Healthy Homes Barometer 2015, available at: http://www.velux.com/article/2016/Energy-renovation-resonates-with-european-home-owners (*accessed on 12/4/2016*)

Germany[10]). An overly prescriptive approach will lead home-owners to delay their decision to modernize their heating due to concerns over cost, technical feasibility, etc. The willingness of owners to invest into modernization measures depends first and foremost on information, advice and planning, combined with focused state and other incentives, *not* compulsion and obligations.

Should a home-owner consider a 'major renovation'[11], a high degree of ambition to use renewable energy for heating becomes not only feasible, but can be required. Why?

Major renovations substantially lower the heat demand of an existing building through better insulation (for example triple-glazed windows; roof insulation etc.). In addition, they open the possibility to combine the installation of a low temperature heating system with a much greater use – up to 100% – of renewable energy sources (see also next point about heating system as a whole).

In renovation projects involving smaller budgets, policies promoting building renovation and improved energy performance should encourage a greater use of renewables. However, such renovation policies should refrain from setting specific levels of renewable heat in order not to discourage stepwise improvements in the energy performance of a building (e.g. adding solar thermal heating to a condensing gas boiler). The exact share of renewable heating that can be used without lowering the comfort of the inhabitants – especially during a cold spell – can only be determined, based on a detailed calculation of the heat demand in different rooms in a given existing building. Given the wide diversity of buildings in terms of age and structure, homeowners should retain the necessary flexibility to invest in high-efficiency and renewable heating solutions that correspond to their needs and are in line with the available budget.

Recognize the savings' potential of the heating system as a whole.

The energy performance of a building depends on the heating system *as a whole.*

A building's heating system is comprised of a heat generator, heat distribution (pipes and a circulator pump), heat storage (hot water tank), heat controls to adjust the temperature, and heat emitters, all in close interdependence with one another. The optimal design and adjustment of all components to each other is crucial to achieve greater energy efficiency: in a nutshell, the sum is greater than its parts.

A case in point is the interdependence of heat generator and emitter: the lower the temperature at which the heat generator runs, the higher the efficiency it achieves[12]: but to transfer heat to the room efficiently, the heat emitters also need to be appropriately sized. Therefore, when a boiler is replaced with a more efficient one, it is important that the heat emitter is adapted to low temperature, as this will optimize the energy saving potential of the heating system.

This is why the EPBD should promote system efficiency, in particular when a building is undergoing a major renovation. A wider uptake of low-temperature heat emitters will facilitate the transition towards compatible low-temperature heat generators – and these are very energy-efficient and run on renewable energy. In addition, the familiar aspect, easiness of use and aesthetic advantages of new heat emitters may win over some end-users, who are less

[10] The land *Baden-Württemberg* (Germany) introduced an obligation to integrate 15% of renewable energies when modernising your heating system. Since this obligation came into force, the modernisation rate of heating systems has dropped significantly: it dropped by 10% compared to the German average (BDH (2013) **'**EWärmeG blockiert energetische Modernisierung**.** Neue Multimomentaufnahme für Neubau und Modernisierung in Baden-Württemberg' (Stand September 2013).

[11] As defined in article 2.10 of the EPBD, a renovation is considered as 'major', if the renovation cost is 25% higher than the value of the building or involves more than 25% of the building's surface.

[12] An efficient gas boiler delivers heat less efficiently in combination with old radiators, requiring high-temperatures. Combining an efficient gas boiler with state-of-the-art radiators or underfloor heating improves its overall efficiency.

familiar with new generation technologies and advanced control systems (e.g. smart thermostats).

Another crucial component of a building's heating is the temperature control system, i.e. the thermostat and the thermostatic radiator valves. Improving the temperature control system offers great energy savings, between 30% and 40%.[13]

How? Consumers can manage with precision the heating system of their home. The boiler temperature can be set with a great degree of accuracy, finding the right balance between the right comfort levels and running the boiler at the lowest temperature possible. Radiators can be turned off, when a part of the house is not used for an extended period. High-precision thermostatic radiator valves are able to avoid swings in room temperature, increasing the energy efficiency of the heating system.

Moreover, advanced temperature control systems are easy to install, affordable and user-friendly: they do not involve heavy retrofitting, they cost typically in the range of 100-200Euros and guarantee a rapid pay-back time, under five years. With their user-friendly interface, they allow consumers to 'play around' with the settings of their heating system, thereby raising awareness about the energy performance of their building (e.g. fuel costs).

In conclusion, EHI recommends that the EPBD review promotes a comprehensive approach to the installed heating systems in European buildings. Cost-effective improvements to the energy performance of buildings are only possible if the heating system as a whole is considered.

About EHI, the Association of the European Heating Industry

EHI represents 90% of the European market for heat and hot water generation, heating controls and heat emitters, 80% of biomass central heating, as well as more than 70% of the hydronic heat pump and solar thermal markets. Our Members are the market leaders in the production of energy efficient and renewable energy technologies to affordably heat buildings. In doing so, they employ directly more than 120.000 people in Europe and invest more than half a billion euro a year in research and innovation.

[13] Siemens (2015) '*Energy efficiency in building automation and control*', available at: https://www.downloads.siemens.com/download-center/Download.aspx?pos=download&fct=getasset&id1=A6V10329557