REHVA
Federation of European Heating, Ventilation and Air Conditioning Associations

REHVA Comments

on

Draft proposal for Ecodesign and Labelling requirements for space heaters, combination heaters (Review of Lots 1 & 2)

In a nutshell

The Ecodesign and labelling regulations are highly impacting the daily work of HVAC professionals and industrials. REHVA is the umbrella organisation representing over 120,000 HVAC design engineers, building services engineers and technicians across 24 European Countries. REHVA positions are summarised below on two main objectives.

1. ***Energy efficiency (Ecodesign requirements):***
   - ***HVAC products are, in general, not 'out of the box" products.***
     The Ecodesign efficiencies are ***based on conventions to compare products****. But especially for HVAC products, they do not represent the real seasonal system efficiencies. The HVAC product efficiency depends largely on the real running conditions, on its use and its system integration.*
   - ***Factory-made packages do not always fit****. The possibility should be left to designers and installers to build on-site packages. Comprehensive on-site energy solutions offer* ***improved efficiency.***
     Therefore, the needed products should be available on the EU market and not be removed.

Ecodesign focuses on product efficiency. But the product approach should not harm the possibility of designers and installers building efficient and affordable systems on-site.

2. ***End user information (Ecolabelling)***

The efficiency classes should reflect and allow for the distinction between different technologies.
In the REHVA proposal, class A is left empty according to Art 11(8).
But requiring an empty class A, where there is no available product offer, may mislead customers used to looking for A-class products.
To integrate the increase of efficiency in an update of the regulation class boundaries would have been the preferred possibility to take into account the progress of technology.

1. Introduction

The Ecodesign regulation is a **product** regulation. It has two important objectives:

- **authorising products** to be put on the EU market,

- **providing information** to the **end user** for the **comparison** of the energy efficiency of products. The comparison is done under **standard** and **conventional** conditions, which are in general **different** from the **real** installation conditions, for example, for the sizing.

As the Ecodesign regulation deals with **products,** only **factory-made package systems** are considered. The **on-site made packages**, put **together by an installer** (e.g. **add-on configuration),** are **not taken into account**.

The difference with other products considered by the Ecodesign regulation, for example, refrigerators, is that space and combination heaters are not products one can **"put-out of the box"** and use them. Especially for heat pumps, the performance is dependent on design and installation.
To reach the **promised performance,** adequate **system integration** must be made by competent professionals.

But the **systems** are made up of **products, and therefore, the needed products must be available on the EU market.**
Factory-made packages do not always fit. Very often, and more and more regarding the integration of renewables, it is the designer who puts the products together to **construct an efficient system on site**.
There is no "one-fits all" solution.

The best solution is **optimised** according to the **specific conditions of the building** and the **needs of the end-user**. An **efficient** system and an **affordable** system **are not the sum of the best performing products;** it is the result of **building optimisation**.

This is the case, for example, for a stand-alone fuel boiler or an electrical boiler.
A **boiler is defined by the energy it uses**. It can be electricity, fossil fuel or a renewable fuel.
An electrical boiler could be very **useful for the thermal storage of electricity** and **contribute to the flexibility of the grid** when the electricity prices are low or even negative.
A fuel boiler may be used as a **peak boiler** in an on-site made hybrid system, improving the efficiency and lowering the environmental impact.

Even products qualified by Ecodesign as "less performing" may be an interesting element in a **system** approach. This is the difference between "white" products and HVAC products.

Therefore, for HVAC professionals, it is important that these products are still available (market access) to build up an on-site system.

<u>Take aways</u>

- **HVAC products** are, in general, **not 'out of the box" products**. Their efficiency depends on the real running conditions.
- The efficiency depends on the use and its **system integration** (e.g. electrical boiler + PV). The Ecodesign efficiencies are based on conventions to compare **products.**

- **Factory-made packages do not always fit.** The possibility should be left to designers and installers to build on-site packages. Comprehensive on-site energy solutions offer improved efficiency. The needed products should be available on the EU market.

It is understood that the Ecodesign focuses on products, but the product approach **should not harm** the possibility of designers and installers to build efficient and affordable systems on-site, adapted to the use of the consumers.

2. Comments on the Commission draft delegated regulation on Ecodesign

2.1 Recitals

Recitals explain the **background and reasons** for the regulation requirements.
REHVA comments are indicated hereafter, and proposals are made.

- Recital (7)

*(7) In order to **encourage the adoption of comprehensive energy solutions** offering **improved efficiency a**nd lower environmental impact when **compared with individual, non-integrated products, combinations** of at least, **one heater of 70 kW or less** with at **least one shower water heat recovery devices, temperature control or a solar device placed on the market or put into service by a single manufacturer** should be considered as a **finished energy product and treated as a package** under the present Regulation.*

Comment REHVA

REHVA welcomes the "**system"** approach and the **recognition that comprehensive energy solution**s offer improved efficiency and lower environmental impact. But a manufacturer may not produce all of the needed packaged products.
It is proposed that the approach should **not focus** on a **single manufacturer but be extended** to a **single designer or installer.** The conformity check should then be made during the installation.

- Recital (10)

(*10) The **minimum energy-efficiency** requirements for **fuel** boilers should **become stricter** in order to boost technological progress.*
*Owing to the **growing share of renewables** in Europe, the **minimum energy-efficiency** requirement for **electric boilers** should remain unchanged **except f**or the application of the lower conversion coefficient.*

Comment REHVA

Ecodesign should be "**technology neutral**".
Boilers may also use renewables (biomass, bioliquids, biogas)**.** The argument for an unchanging minimum energy-efficiency requirement or electrical boilers also applies to fuel boilers because it is expected that boilers will use a growing share of renewables in Europe.
It is proposed to keep the **minimum energy efficiency requirement for fuel boilers unchanged**.

- Recital (11)

*(11) A lower **turndown ratio** can significantly **increase heating energy efficiency** in r**eal** operating conditions, although it has only a **limited effect** on the **standard**-rated efficiency of fuel boilers. For that reason, a minimum turndown ratio should be applied to fuel boiler heaters with a rated output lower than or equal to 70 kW.*

Comment REHVA

It is stated that the turndown ratio has only a limited effect on fuel boilers' heating standard-rated energy efficiency. But the turndown ratio may have a significant impact on the affordability and availability of the product.

Without further explanation of the impact, i**t is proposed** that **no turn-down ratio will be applied to fuel boilers**.

- Recital (14)

(*14) The **conditions for testing water**-heating energy efficiency for combination heaters under this Regulation should be **harmonised**. In particular, the requirement for **combination heaters** to be able to supply **water at 50 °C** in 'out-of-the-box mode' for all the declared load profiles **entails significant energy savings** as it avoids that the **electric backup heater would need to operate continuously.** That requirement reflects **real-life operation** in which **heat pump water heaters** are typically installed with **temperature set points** of **above 50 °C and below 55 °C***

Comment REHVA

Please clarify which temperature set points are considered here. Is it the temperature that the heat pump has to deliver to the water tank, or the temperature of the water tank?

The risk of Legionella should be mentioned in the recital. Reference can be made to the requirements already applicable under the EU Drinking Water Directive 2020/2184.

- Recital (21)

*(21) Real-world performance and energy consumption of heaters-depends largely on their operating conditions. **Setting self-monitoring requirements for the space heating function should enable customers and installers of heaters to track** and understand the impact of technical and behavioural changes and other operating conditions in terms of energy savings. For reasons of legal certainty, clear storage and access conditions to stored information both for users of individual appliances and for third parties, should be set.*

Comment REHVA

REHVA **welcomes** this recital, especially for heaters where the performance strongly depends on the settings and running conditions. It is essential to detect not adequate settings and malfunctions.

- Recital (22)

*(22) Measurement methods and **calculations** should be updated and improved to r**eflect** the **technological progress and real-life conditions**. Specifically, **new measurement** and calculation methods should be established for **hybrid heat pumps** to adequately address this*

*emerging product category. The existing test methods are categorised as either **'separate'** or **'combined'** test methods, **both of which are acceptable**, provided they maintain high accuracy.*

Comment REHVA

The **link between standardised calculation methods and product testing is key**. **Product testing** results are the input for **system calculation methods**. Designers, academia, testing institutes and industrials are working together to revise the EN 15316-4-2 Heat pump energy efficiency calculation method. This revised method uses the results of the **separate test method** as calculation input.

It is proposed that only the **separated test method should be used in product testing i**n order to keep the link with the system calculation methods often used for compliance with building regulations.

2.3 Annex to the Commission Regulation on Ecodesign requirements

ANNEX II Ecodesign minimum energy efficiency requirements

- Minimum space-heating energy-efficiency requirements

*The **seasonal space-heating energy efficiency** ηs,h (in %) of the specified heaters in **average climate conditions** shall **not be lower** than the values given in **Table 1.***

Table 1 Minimal seasonal space-heating efficiency

	Heater type	ηs,h (%)	2013
1	B1 fuel boiler space-heater, standard-rated heat output of **10 kW or less**	**76**	**75**
2	B1 fuel boiler combination heater,76 heat output of **30 kW or less**	**76**	**75**
3	Fuel boiler heater with a standard-rated heat output of more **than 70 kW 95 (η4)**	**92 (η1)**	**-**
4	Fuel boiler heater other than indicated in rows 1-3, fuel main energy source	**92**	**86**
5	Electric boiler heater	**48**	**47 1)**
6	Others*	**115**	
	2013: Electric HP medium temperature 145 **% (**with CC 1,9) LT 164 % **1)**		

1) With CC=1,9, the new total primary energy conversion coefficient (2013: 2,5)

**packages are not included; there are no minimum seasonal space-heating efficiency requirements for packages, only for heaters included in packages*

Comment REHVA

It is important to underline that the requirements are related to **minimum** energy efficiency requirements just providing access to the EU market. The efficiencies are based on **conventional** test data. For HVAC products, the **real** efficiencies are very much dependent on the **system integration** (running conditions, sizing).

In **Table 1**, for all fuel boiler heaters in rows 1-3, the minimum requirements are kept the same. This is also the case for electrically powered heaters.

Only for the fuel boiler in **row 4,** the **minimum** requirements are increased from **86%** (2013) **to 92% GCV.** This change limits the possibility of using boilers with renewable fuels to optimise the whole system and make it more affordable.

It is proposed to apply the **maintenance of the minimum requirement** also for fuel (combi) boilers.

For the EU, competitiveness is at risk when lowering the threshold to 100% because the market will be opened to non-EU manufacturers that previously were not able to meet the previous minimum efficiency requirements.

It is proposed to reconsider the minimum energy efficiency threshold of 115%, which would represent a reasonable and balanced approach and ensure better alignment with the Renewable Energy Directive.

- **1.2.** Modulation rééquipements for boilers

*The turndown ratio of **fuel** boiler heaters using **gaseous** fuels with a standard-rated heat output lower than or equal to 70 kW, with the **exemption of B1 boiler heaters, shall** be **lower than or equal to 20 %.***

Comments REHVA

As stated in recital (11), the **turndown ratio has only a limited effect** on the standard-rated efficiency of fuel boilers. But it may increase the price of the equipment.
It is proposed to **delete the turndown ratio** as a minimum requirement.

2.4 Takeaways on the Commission draft on Ecodesign requirements

- **Minimum requirement conditions the access to the EU market.**
- **There is a difference between "out-of-the-box" products, such as a refrigerator or other "white products" and HVAC devices.** HVAC devices are integrated into a system. The examples mentioned before show how products, qualified as less performing, when integrated in comprehensive on-site made energy solutions, offer **improved efficiency**.

It is proposed that the **minimum energy efficiency requirements for all fuel boilers are kept unchanged.**

3. Comments on Commission draft delegated regulation on energy labelling

3.1 Annex II: Energy-efficiency classes and acoustic airborne-noise-emission classes

The energy efficiency classes are defined to **better inform end users** on the **potential** energy savings and to **differentiate and compare products** on a **conventional basis.** On the label, only the classes (A-G) are indicated. No quantified data are visible.

- Seasonal space-heating-efficiency classes for space heaters and packages in medium-temperature heating applications

*The seasonal space-heating energy-efficiency class, for **average climate conditions**, for space heaters and packages for **medium-temperature application** shall be determined on the basis of their seasonal space- heating energy-efficiency ηs,h as set out in **Table 1.***

Efficiency Class	Efficiency Class	Seasonal efficiency	Seasonal efficiency	**Seasonal efficiency**

Draft 2025	2013	2013	draft 2025	**REHVA proposal**
	A+++	>1**50**		
	A++	**125** -<150		
	A+	**98-<**125		
A	A	**90**-<98	**>300**	**>300**
B	B	**82**-<90	**235** - <300	**200** – <300
C	C	**75-**<82	**185** -<235	**160** - <200
D	D	**36**-<75	**145** - <185	**130-** <160
E	E	**34**-<36	**115** - <145	**90** -<130
F	F	**30-**<34	**90** - <115	**60**-<90
G	G	**<30**	**<90**	**<60**

Table 1: Seasonal space-heating-efficiency classes- space heaters 2013/2025/ REHVA proposal

Comments REHVA

In the draft energy labelling regulation, it is proposed to **abolish the existing classes up to A+++,** which are now rescaled into **classes from A to G.** It defines **an empty A class** and a rescaling of the rest of the **classes from B to G** (see table 1, draft 2025).

REHVA **welcomes the rescaling of the classes from A to G.**

If the intention of the classes is to provide customers with more accurate information, enabling them to make better-informed decisions by comparing and differentiating products, then **the proposed thresholds of the classes in the draft of the Commission are not adapted, because too many different products would be put in the same class.** (see **table 1: column Seasonal efficiency draft 2025**). For example, the proposed scale does not allow to differentiate between an electrical boiler (40%) and a standard fuel boiler (80%).

To **provide customers with more accurate information** to make better-informed decisions, the **proposed thresholds of the classes are not adapted.**

Hereafter are shown the rounded seasonal efficiencies of commercialised heaters:

1. Electrical boiler: 40 -50 % (with CC=1,9) (proposal: **class G**)
2. Standard boiler (B1): 75 – 85 % (GCV)(proposal: **class F)**
3. Low temperature boiler (BT): 85 – 90 % (GCV) (proposal: **class F)**
4. Condensing boiler: 90 – 100 % (GVC) (proposal: **class E)**
5. Hybrid heatpump: 130 % (proposal: **class D**)
6. Electrical air to water heatpump: SCOP = 3/1,9 = 160 % (proposal: **class C)**
7. Electrical water to water heatpump: SCOP = 4,5/1,9 = 237 % (proposal: **class B**)
8. Electrical water to air heatpump: SCOP = 5/1,9 = 263 % (proposal: **class B**)

The rationale behind the thresholds for the classes proposed by REHVA in **Table 1** is based on these average values. The classes represent and are associated with the different technologies.

It is proposed to set the thresholds of the energy classes as proposed in **Table 1, Seasonal efficiency REHVA proposal.**

Proposing **an empty class A**, if there is **no available product,** may **mislead customers,** used to looking for A-class products. This approach is also **not coherent** with other energy labelling

schemes. For example, in the revised EPBD, class A is related to a zero-emission building. Also, **subsidy schemes** are generally linked to class A. **An empty class A will exclude many products from subsidies.**

It is proposed to change the class A efficiency threshold to include the best performing products.

4. Resume

- **General comment**

HVAC products, and especially heaters, are **not „out-of-the-box" products**. The **system integration**, made by HVAC professionals, is key to their **real** energy efficiency.

Factory-made packages do not always fit. The possibility should be left to designers and installers to build on-site packages

These characteristics have to be taken into account when dealing with product efficiencies.

It is understood that the Ecodesign focuses on products, but the **product approach should not harm** the possibility of designers and installers to build efficient and affordable systems on-site, adapted to the use of the consumers.

- **Ecodesign requirement**

Minimum requirement conditions the access to the EU market. But especially for HVAC products, they **do not represent the real seasonal system efficiencies**. An integrated, comprehensive on-site made energy solutions offer improved system efficiency.

It is proposed that the **minimum energy efficiency requirements for heaters should not be changed.**

- **Ecolabeling energy efficiency classes**

If the updated energy labelling regulation intends to provide customers with more accurate information so that they can **make better-informed decisions by comparing products,** the **proposed thresholds of the classes in the draft of the Commission are not adapted**. Proposing an empty class A, where there is no available product offer, may mislead customers, used to looking for A-class products.

It is proposed to **set the thresholds** of the energy classes as **proposed in Table 1, Seasonal efficiency REHVA proposal.**

At this stage, the draft Commission regulations on Ecodesign and Energy labelling are not adapted to the needs of HVAC professionals and consumers and should be reviewed.