Brussels, June 2019

Discussion paper
Ecodesign and Energy Labelling of heating products focus on space heaters.

Heating of building and production of hot water represent almost a quarter of the EU energy consumption and of the bloc's CO_2 emissions. Decarbonising heat must be a priority if we are serious about achieving the 2050 objectives set in the long-term strategy (LTS) for decarbonising the EU, and the climate goals set in the Paris agreement.
Space heaters, combi boilers and water heaters represent the biggest share of heating appliances installed in the EU and generally last for longer than 15/20 years. .

Put simply, Europe will fail to achieve its decarbonisation goals by 2050 if inefficient electric appliances and heating systems using non-renewable electricity and fossil fuels continue to be installed in the EU after 2030. This will create a long-lasting lock-in effect, hampering the uptake of more efficient and renewable technologies and jeopardising the achievement of climate objectives.

The EU's LTS includes only two scenarios which achieve the decarbonisation objective by 2050: 1.5 TECH and 1.5 LIFE. The modelling for the LTS includes analysis on both the share of electricity in space heating in buildings and the non-electricity fuel consumption of buildings. In 1.5 TECH and 1.5 LIFE, the share of electricity in space heating for residential buildings increases drastically and even more so for service buildings. Furthermore, oil and coal are completely phased out of non-electricity fuel consumption in buildings, and the use of natural gas becomes marginal (just 3%).[1]

Our proposal is to **phase out inefficient electric technologies and technologies mainly operated by fossil fuels from the European market by 2030, to ensure a possible carbon neutrality of heating by 2050**. This is a matter of consistency with our EU and global commitments, as well as the projections which have been made by the European Commission in the LTS.

The Ecodesign and Energy Labelling rules for boilers and water heaters are currently being revised, and this should be an opportunity to take a bold step towards decarbonising heat. The current discussion around the revision of the Energy Label for these products focuses on the adaptation to the new Primary Energy Factor (PEF) of 2.1. We propose to adapt the Energy Labelling schemes for heating products to the new rules introduced in the revised Energy Labelling Regulation of 2017, even if this revision was possibly planned for a later stage. This would avoid a repeated revision of the label, first to adapt to PEF of 2.1, then to adapt to the requirements of the 2017 regulation in the same decade. Articulating this early revision of the Energy labelling scheme with the Ecodesign requirements would help create clear market visibility and signal that fossil fuels and most inefficient appliances need to be eliminated from the market as early as possible and anyway ahead of 2030.

[1] pp.103-106 "Changes in the fuel mix in heating and cooling"
https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf

This should be done maintaining **a unique labelling scheme**, as any split labelling scheme between different technologies would be deterring a proper comparison, fail to drive innovation, and send confusing signals to consumers and installers.

We propose to change **the heating paradigm: moving from central heating systems mainly based on fossil fuel technologies - with a marginal contribution of renewable technologies, to central heating systems mainly operated by renewable and efficient technologies. If need be, those renewable, and efficient technologies could be marginally assisted by fossil fuels to be replaced with renewable fuels from 2040**.
To support this vision, we suggest to set a new unique Energy Labelling scheme, to create the necessary market visibility and enable a proper anticipation by the economic actors and the authorities.

For boilers (bearing in mind that water heaters and local space heaters are also to be addressed with a similar perspective) this means:
- The inefficient electric appliances and less efficient (non-condensing) fossil fuel technologies are included in a **bottom class G.**
- All condensing boilers and similarly performing technologies are included in the **second bottom class F**.

Existing label, PEF=2.5	Proposed label, PEF=2.1	Examples of heaters with proposal	Class width
A+++ (Eff >150%)	A (Eff. >190%)	Best ground source heat pumps with good controls, HP + solar hybrids	n.a.
A++ Eff 125 – 150%)	B (Eff. 166 – 190%)	Heat pumps, best boiler + HP hybrids, HP + solar hybrids	14%
A+ (Eff 98 - 125%)	C (Eff. 143 - 165%)	Heat pumps, boiler + HP hybrids, HP + solar hybrids	15%
A (Eff. 90 – 98%)	D (Eff. 123-142%)	CHP + solar hybrids, Heat pumps, boiler+ HP hybrids	15%
B (Eff. 82 - 90%)	E (Eff. 106 - 122%)	Solar+ boiler hybrids, CHP	15%
C (Eff. 75-82%)	F (Eff. 87-105%)	Condensing boilers	21%
D Eff. 36-75%)	G (Eff < 87%)	Non-condensing B1 boilers	n.a.
E (Eff. 34 – 36%)		Electric boilers	
F (Eff. 30-34%) (Empty class)			
G (Eff. > 30%) (Empty class)			

The Ecodesign regulations would then phase out the **class G** by 2025 and **class F** by 2030. Gas, notably renewable gas, could still be used in hybrid technologies after 2030, providing they meet the necessary performance requirements to be at least included in the class E. We are aware of innovative directions towards hydrogen and renewable gas as substitutes to fossil fuels. However, we do not think that this foreseen development justifies allowing boilers mainly operated by fossil fuels, and notably condensing boilers, to remain on the market after 2030. Counting on the development of these gases would have the dangerous side-effect of having a large stock of fossil fuel operated appliances installed but without the guaranteed supply of hydrogen or renewable gas, thus perpetuating the existing lock-in effect. With a clear phase out of inefficient electric and fossil fuel-based appliances, we would not prevent the introduction o market of hydrogen-based technologies in the future. Neither would we create a barrier to the uptake of renewable gas, which will anyway be supplied in limited quantity and can be used for hybrid technologies using gas as a complement of renewable energy (e.g solar thermal systems and heat pumps).

We suggest to set the limit between **F and E class** at 105% (Seasonal space heating energy efficiency η_s) so that fossil fuel boilers with a minor assistance of renewables are excluded, and to make sure that only efficient technologies operating mainly with renewable energy can remain on the market from 2030.

Besides this, we suggest using the review of the energy labelling scheme to change the calculation methodology and conditions related to certain technologies, notably CHP and solar heating, which are unfairly disadvantaged with the current calculation methodology.

Finally, for the dwellings not fit for condensing boilers technologies (B1, C4, C8), we strongly recommend a support by national and local authorities, eventually assisted by EU structural funding, to ensure refurbishment compatible with best renewable heating technologies. Any support to renovation targeting the installation of fossil fuel technologies (condensing boilers notably) will be a waste of money and opportunity.

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Annexes

1- Paper by Inforse on Energy Label scheme explaining further why we suggest such a labelling scheme:

Proposals for a Boiler Label Rescaling

Gunnar Boye Olesen, INFORSE-Europe / Coolproducts Campaign, June 2019

Even though the current label scale for boilers and other heaters for hydronic heating systems is only a few years old, it is not optimal to guide consumers to the highest efficiency of their heating systems or to support the fast transition to a non-fossil society. The present label scale is optimised to support the conversion from non-condensing to condensing boilers, which is a success.

Now the label scale needs to be changed because of the change of the Primary Energy Factor (PEF) from 2.5 to 2.1. In addition, the label scale needs to be rescaled to an A – G scale by 2030 at the very latest. The current revision is a good opportunity to rescale the label support as possible the transition to a highly-efficient, fossil fuel free society. We propose to do this with a label scale where the bottom class (G) contains the non-condensing boilers that we find can be phased out of the market in 2025 and the next class (F) contains condensing boilers that we find can be phased out of the market by 2030. We will not succeed in phasing-out fossil fuels in EU, if we continue the large use of natural gas and oil for heating. Some gas use can continue with biogas and hydrogen, but we find that in buildings this should be limited to gas boilers combined with solar or heat pumps, where the gas boiler is effectively a back-up for the renewable supply. Ecodesign regulation backed by energy labelling can be an important policy tool to realise this.

Therefore, we propose a rescale of the label for boilers based on the following principle, in addition to the change of the PEF:

- The bottom (G) label class shall contain the non-condensing boilers and electric boilers
- The next-to-bottom label class (F) shall contain the condensing boilers.
- The next labels (B,C,D, E) shall contain the nstallations with functioning with solar energy, heat pumps, CHP and combinations, including hybrids of heat pumps and boilers as well as hybrids of solar and boilers.
- The highest label class (A) shall only contain for the very best solutions and combinations available today.
- The label classes A, B, C, D, and E shall have approximately the same relative width.

The basis for using these principles to develop a label scale is the following analysis of the efficiencies of the 10 most common heating technologies and combinations using the present label scale methodology.

Technology	Lower efficiency (Ecodesign limit adjusted to PEF = 2,1)	Higher efficiency (PEF = 2,1)	Data sources for high efficiency
Electric boilers	43%	49%	Class VI control, 2 W standby loss for 10 kW boiler
Non-condensing boilers	76%	86%	Limit of condensing boilers
Condensing boilers	87%	98%	Best on market in Denmark 2019 below 20 kW (Bosch 9000i W20) with class VI control
CHP	100%	123%	Assuming 25% electricity and 95% total efficiency, electricity weight reduced to PEF = 2,1, control class VI, energy label methodology, other methodologies give higher efficiencies
Heat pumps, air-water	131%	187%	Best on market in Denmark SCOP 3,9 (Metroair I 16 - 12 kW), control class VI
Heat pumps, ground source	131%	194%	Best on market in Denmark SCOP 4,15, (Bosch 7000i LWM - 10 kW), control class VI, 5% reduction from brine pump (F2)
Condensing boilers + solar	87%	121%	9 kW boiler, 93% efficiency, 15 m2 collector 70%, 700 ltr. tank type B, package label calculation, control class VI
Heat pumps + condensing boilers	131%	189%	Best ground source HP, SCOP 4,15, 10 kW, boiler 9 kW - 93%, package label calculation, control class VI
CHP + solar	100%	142%	10 kW CHP, above example, 15 m2 solar 70%, 700 ltr. tank type B, package label calculation, control class VI
Heat pumps + solar	131%	205%	Best ground source HP, SCOP 4,15, 10 kW, 15 m2 solar collector 70%, 700 ltr tank type B, package label calculation, control class VI

The calculations are made for existing technologies with current methodology for energy labelling, adjusted to PEF = 2.1. If the review results in changes in methodology or in conditions, the resulting efficiencies will change. Proposals in the review study that can change this include changes of methodology and conditions for heat pumps, methodology for CHP, methodology for solar.

The most efficient technologies are chosen as realistic high-end technologies. It is in principle possible to have higher efficiencies with larger solar systems and with more efficient CHP, for instance with fuel cell technology. All solutions are evaluated with heating control class VI (with outdoor and room sensors). The control class VII gives 1% higher efficiency than in the examples with control class VI, but controls of class VII require individual room thermostats, which can give substantial costs compared with benefits.

We support the revision of the methodology for solar and CHP, allowing them to declare a higher efficiency than in the current methodology. This revision can start with the proposals presented in the current revision of Ecodesign and energy labelling of boilers.

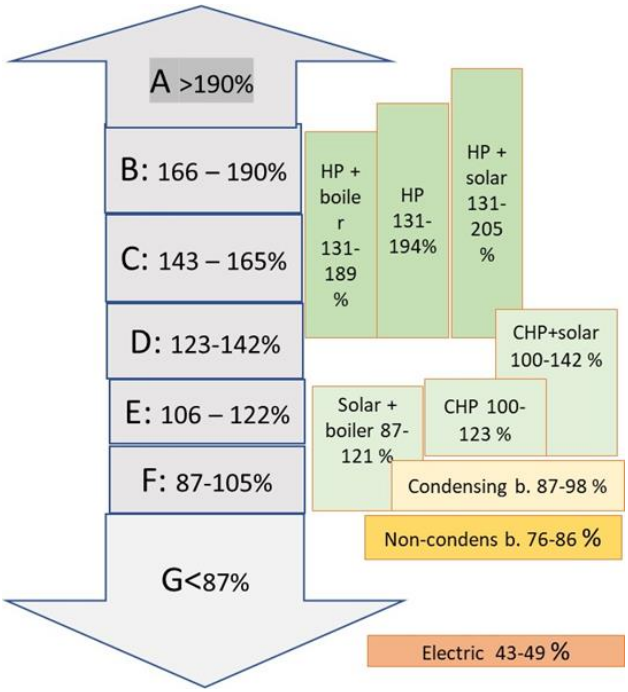
Using these efficiencies, the highest efficiency class (A) shall have efficiencies above 190%, the lowest class (G) shall have efficiencies below 87% and the second lowest class (F) efficiencies below or at 105%. The limit of 105% is proposed to avoid that boilers combined with very small renewable inputs can qualify for the next label class (E). This can be realised with the label scale shown in the left column in the table below with a PEF = 2.1. In the second column in the table is given approximate equivalents for the proposed label scale with PEF = 2.5. The third column is the existing label scale made for a PEF = 2.5 and in the fourth column is a list of the main technologies in the proposed label classes (for existing empty classes mentioned in brackets). The right column gives the class width for the proposal in the left column.

Proposed label, PEF=2.1	**Proposed label, PEF=2.5**	**Existing label, PEF=2.5**	**Examples of heaters with proposal**	**Class width**
A (Eff. >190%)	A (Eff. >160%)	A+++ (Eff >150%)	Best ground source heat pumps with good controls, HP + solar hybrids	n.a.
B (Eff. 166 – 190%)	B (Eff. 139 – 160%)	A++ Eff 125 – 150%)	Heat pumps, best boiler + HP hybrids, HP + solar hybrids	14%
C (Eff. 143 - 165%)	C (Eff. 120 - 138%)	A+ (Eff 98 - 125%)	Heat pumps, boiler + HP hybrids, HP + solar hybrids	15%
D (Eff. 123-142%)		A (Eff. 90 – 98%)	CHP + solar hybrids, Heat pumps, boiler+ HP hybrids	15%
E (Eff. 106 - 122%)		B (Eff. 82 - 90%)	Solar+ boiler hybrids, CHP	15%
F (Eff. 87-105%)		C (Eff. 75-82%)	Condensing boilers	21%
G (Eff < 87%)	G (Eff < 86%)	D Eff. 36-75%)	Non-condensing B1 boilers	n.a.

		E (Eff. 34 – 36%)	Electric boilers	
		F (Eff. 30-34%)	(Empty class)	
		G (Eff. > 30%)	(Empty class)	

As mentioned below, we support a revision of the methodology for solar and CHP, allowing these technologies to declare higher efficiency in the label scale.

An illustration of the label scale and the efficiencies of different existing heating technologies are shown below with data from above proposal for PEF 0 2.1 and the above list of heating technologies.



2- Coolproducts comments on boilers and water heaters as circulated to VhK

Coolproducts Position paper on space heaters/boilers
Coolproducts position paper on water heaters