

# POSITION PAPER

## COMMENTS FOLLOWING THE ECODESIGN AND ENERGY LABELLING CONSULTATION FORUM ON SOLID FUEL BOILERS

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### INTRODUCTION

We welcome the revisions of the Ecodesign and Energy Labelling measures for **solid fuel boilers** (EC 2015/1189 and EC 2015/1187) that are long overdue. Solid fuel combustion for residential heating is a major source of air pollution in Europe, and 80 to 90 million EU households use solid fuel for heating purposes. It is therefore key to use ecodesign and energy labelling requirements to address the threats that solid fuel heating can pose to human health, climate and the environment, specifically via air pollution as well as its contributions to climate change, biodiversity loss and forest resource use.

The Coolproducts campaign, and in particular ECOS, EEB, Deutsche Umwelthilfe, INFORSE-Europe and Green Global Future, would like to submit views and comments following the Consultation Forum meeting that took place on 8<sup>th</sup> December 2025.

### AIR POLLUTION AND BIOMASS BURNING

Residential burning of wood and coal in small stoves and boilers is the predominant source of health-hazardous and climate-damaging pollutants in the EU: these appliances emit particles very small in size and they are [responsible](#) for **62 % of fine particulate matter (PM<sub>2.5</sub>)**, **36 % of black carbon (soot, BC)**, and **91 % of benzo(a)pyrene (BaP)**. The latter is carcinogenic and has several other negative effects on [human health](#).

**Black carbon** is a component of particulate matter, and it is the most relevant short-lived climate pollutant. Black carbon from wood burning is [as toxic as the black carbon emitted from diesel cars](#). According to the [IPCC](#), black carbon's global warming potential for 100 years (GWP<sub>100</sub>) is 900 CO<sub>2eq</sub>.

and even higher short-term impact, as GWP<sub>20</sub> is 3,200. Though still relevant, thankfully the share of black carbon particles in the exhaust of automated biomass boilers is usually lower than in solid fuel local space heaters but should not be underestimated.

On top of this, even modern automated biomass boilers (without electrostatic precipitator, ESP) show high emissions of **ultrafine particles** (PM<sub>0.1</sub>). These particles penetrate deep into the body, can cross the blood-brain barrier, and trigger inflammatory processes.

Recent studies show that **PM<sub>2.5</sub> emissions** from the residential sector are almost completely due to biomass burning. This is relevant both in rural areas and cities. The [European Environmental Agency](#) estimated that over **95 % of the urban population is exposed to PM<sub>2.5</sub>** levels above the World Health Organization (WHO) guidelines, causing 182,000 premature deaths in the EU in 2023. In addition, newer studies suggest that stoves can pollute the indoor air quality to substantially [higher particle levels](#) than emissions measured close to polluted streets during rush hours. The smoke from residential burning is composed of the same harmful pollutants – particles and polycyclic aromatic hydrocarbons (PAHs) – as tobacco smoke, which increases the risk of cancer, blood clots, cardiovascular diseases, asthma, bronchitis and other illnesses. Residential biomass burning contributes significantly to morbidity and premature mortality in the EU, thus being an expensive burden to society.

Central and Eastern European countries are affected the most, as concluded by a [European Parliament Pilot Project](#). The research highlights also that burning waste in biomass appliances is a common practice in households during winter months, which causes the release of hazardous pollutants, such as high quantities of PAHs leading to BaP toxicity equivalent of a factor up to 4,100 times higher than wood combustion. In addition, burning waste emits high amounts of toxic dioxin.

Many Member States rely on biomass to [switch to renewable heat](#) (because biomass is, unfortunately, still counted as carbon neutral). Consistency of the three pillars of [EU's clean air policy](#) is therefore crucial and needs to be ensured with appropriate legislation at the EU and national level. For instance, inconsistencies were found between the additional air pollution caused by residential biomass and the German National Air Pollution Control Programme (NAPCP), as judged by the [Berlin-Brandenburg higher administrative court](#). Furthermore, the [Evaluation of the National Emission Reduction Commitments Directive](#) published by the European Commission in December 2025 points out, that the *"...only case where there is a negative contribution to emission reductions is linked to biomass"*. Consequently, the publication hints at the importance of the Ecodesign and Energy Labelling regulations to mitigate this problem.

While the number of installed local space heaters exceeds the number of solid fuel boilers in Europe, the boilers operate for significantly longer periods and burn much larger quantities of fuel, as they tend to be installed in larger buildings and as the main heat source. In Germany, for instance, around 12 mio. local space heaters and about 1 mio. solid fuel boilers are installed. However, [more than 45 percent of solid biomass is burnt in boilers](#) (data for appliances below 1 MW).

**The revision of the Ecodesign and Energy Labelling regulations for biomass boilers represents a key opportunity to cut emissions from the EU's main air pollution source.** This will improve public health, mitigate long-term consequences of climate change and help prevent irreversible melting of the Arctic

ice due to the deposition of black carbon. It also supports policy goals in the [UNECE Gothenburg Protocol](#), WHO air quality guidelines and other pertinent EU legislation such as the National Emission Reduction Commitments Directive, the Ambient Air Quality Directive and the overarching Zero Pollution Ambition.

## MEASURES NEEDED

### SCOPE AND GENERAL REQUIREMENTS

The scope of the Ecodesign regulations should be extended to boilers **up to 1MW**, so that all new boilers for space heating or similar purposes in the EU must meet energy efficiency and air pollution requirements. There is currently a loophole for appliances between 500 and 1000 kW as the [Medium Combustion Plant Directive](#) has a scope for units only above 1 MW. Extending the scope is feasible as national regulations show: the German First Ordinance on the [Implementation of the Federal Immission Control Act](#) (1. BImSchV) cover solid fuel appliances of up to 1 MW. Reckoning the challenges to test those appliances in labs, an on-site test could be undertaken after installation, as this is a common practice in Germany (also Switzerland), where on-site measurements are mandatory for solid fuel boilers every two years. Furthermore, other central heating products, such as space and waters heaters (lot 1 and 2) have a similar scope to include products up to 1 MW, and this would be useful for merging the regulations in the future.

In addition, we strongly support the inclusion of **non-woody biomass in the product scope** as these appliances usually have high emissions and this would help close a loophole: currently, manufacturers can claim that the intended use of their products would be burning of non-woody biomass and circumvent product policy requirements due to the lack of regulation. **Manually operated solid fuel boilers** should no longer be allowed in the European market.

While this document addresses solid fuel boilers, below are some elements that are common to all solid fuel appliances below 1 MW including local space heaters – therefore, they need to be tackled in both regulations:

- As part of the transition away from fossil fuels, we call for the **phase-out of coal-based appliances on the EU market** within this revision. As shown in the [presentation of the Consultation Forum in 2023](#), coal stoves stock counts only 36,000 products, mostly in Belgium, representing only 0.1 % of the market. Coal is the most [unsustainable energy source](#), thus it will be important to move away from new installations to achieve the long-term climate neutrality targets in the EU.
- We regret to see the **lack of emissions thresholds for black carbon, ultrafine particles and BaP**: they are harmful pollutants addressed in the new Ambient Air Quality Directive (AAQD) and highlighted in the [NEC Directive](#).
- Recurring **measurements in real-life operations** by professional inspectors commissioned by authorities (e.g. chimney sweeps) with a focus on particle number (PN) or BC emissions should be included, as already conducted in the vehicle sector. This ensures that emission thresholds are met in real-life use and that the emission reduction techniques are working effectively.

- Poor **fuel quality** causes even more air pollution and climate impacts; hence, setting ecodesign requirements should be further explored, completed with information in the energy labels, to promote cleaner fuels over polluting sources.
- The articles on **circumvention and software updates** are proposed to be removed from the draft Ecodesign regulation. As Art. 10 of the EU 2024/1781, we call to include the same provision to prevent circumvention and worsening of performance.
- We support the important requirement of **3<sup>rd</sup>-party verification**. It will avoid unrealistic self-declaration and fill the gaps of low market surveillance controls. As detailed in Annex II of EC/768/2008, this module specifies testing of one unit or analysis of the technical documentation, we recommend the former for the conformity assessment requirements.
- It is important that all the **information channels** – such as manuals, free websites, etc. – contain the product information (Annex II (2) current regulation) and that they should be available on free access websites for 20 years after the last placing on the market.
- Given the lifetime of the heaters, **spare parts** should be available for at least 20 years after the last unit is placed on the market.
- We firmly believe that **no change to the energy content of wood shall be made** in the energy efficiency methodology.
- Horizontally, the limit units need to be changed from mg/Nm<sup>3</sup> to **mg/kWh** of fuel (or to other energy input terms like g/GJ) to harmonise this sector with other energy-consuming sectors with air pollution emissions, allowing comparability and transparency. If not changes then the limit values should be given in mg/kWh or g/GJ as well.
- For the next review of the regulation: In the medium term, new solid fuel appliances need to fulfil the same **emission thresholds as EURO VI trucks** (PM, PN and NO<sub>x</sub>) sold in the EU after 2014.

## POLLUTANTS EMISSIONS

Currently, solid fuel boilers are mostly fuelled with wood pellets, but also logwood, wood chips and coal (e.g. in Poland). They usually have fewer emissions than local space heaters but still emit large amounts of **ultrafine particles**. Thus, a substantial reduction of emissions is crucial to protect human health.

Based on the current technically feasible reduction potential, we strongly recommended to include a very significantly higher stringency level (policy option D3) in the revised regulation for solid fuel boilers:

- More than 90 % of particles emitted from biomass appliances have a size of less than 1 µm. Therefore, an additional limit value for **particle number (PN)** needs to be introduced – as it is already the case in the vehicle sector. Based on the emission level reached in [tests with solid biomass appliances with electrostatic precipitators \(ESP\)](#), a PN limit value of 2x10<sup>6</sup>/cm<sup>3</sup> (or reduction of more than 90 %) is recommended for solid fuel boilers as a first step, with a further reduction in the medium term.
- The present Ecodesign emission limits for **particle mass** are 40 mg/Nm<sup>3</sup> (60 mg/Nm<sup>3</sup> for manually stoked boilers). This emission level is way too high to protect human health and does not reflect BAT. The emission requirements for particles in the revised regulations needs to ensure that effective emission reduction technology (in particular: electrostatic precipitator/ESP) becomes standards. As shown in presentation of the Consultation Forum, a huge number of boilers available in the market would meet provisions of 3 mg/Nm<sup>3</sup> or lower, if they are equipped with ESP. This is also reflected by the numerous boilers eligible for the bonus of [German funding scheme \(BEG\)](#), with limit value of 2,5 mg/Nm. Furthermore, data from measurements with boilers shows that an ESP usually helps to reduce emissions of particle mass by more than 80

percent (e.g. see [Handbuch Bioenergie-Kleinanlagen](#), page 101 TFZ-Study [Untersuchung der Praxistauglichkeit eines Elektrofilters für Kleinfeuerungsanlagen](#) and [project on ESPs financed by German Ministry of Economic Affairs](#)).

- The current **OGC limit** is 20 mg/Nm<sup>3</sup> (30 mg/Nm<sup>3</sup> for manually stoked boilers), but BAT is 3 mg/Nm<sup>3</sup> or lower for automatically stoked boilers, thus the threshold should be aligned to BAT and explore the possibility to similarly proceed with lower limits for manually stoked boilers, if they are maintained on the market, which we do not support.

**Additional technical requirements** linked to emission performance that need to be considered in the revision are:

- Low-emission solid fuel boilers are usually equipped with an either internal or external ESP. For the latter, supplementary requirements – like counter of operating hours and automatic cleaning – are recommended to ensure efficiency and continuous operation of emission reduction technology.
- A [mandatory buffer tank](#) requirement should be introduced, to reduce partial load or on-off operation, in line with the specifications of the current German funding scheme BEG: buffer tank volume of, at least, 30 litres per kW of nominal heat output.

## TESTING PROCEDURE

The present test methods in the Ecodesign regulations only include particles directly from combustion, not the large quantity of condensed particles formed when the flue gas meets the ambient air. We propose to switch to a test method that is more realistic than EN-PME: a method that includes the condensed particles, with the use of a dilution tunnel. We also propose measurement of particle numbers, as it has been the standard for diesel vehicles for 15 years.

## EFFICIENCY AND LABELLING

We welcome the increase in the requirements for **energy efficiency to 82 %** measured with the Gross Caloric Value (GCV) of the fuel.

We **fully support** the European Commission to work on the possibility of merging the Energy Labelling of solid fuel boilers (lot 15) with space and water heaters (lot 1 and 2). It will unleash the fullest potential of the Energy Labelling, as consumers can finally compare all the appliances that can serve the same purpose (heating households), as it is currently the case for local heating and cooling applications – under local space heaters (lot 20).

In addition, we propose **to add an indication on air pollution** on the energy label with a label scale with top classes for the cleanest combustion with least particles, combining total number of condensed particles with particle numbers. This enables consumers to identify better performing appliances. In case of a merged heating label, the air pollution class should be a criterion for solid fuel boilers to be eligible or not for public subsidies.

Finally, we recommend decreasing the verification tolerance for energy efficiency from 6 % to 4 %, aligning the tolerances between Energy labelling and Ecodesign, and providing clear guidance to manufacturers and market authorities.

## OTHER REQUIREMENTS

Although these were not discussed at the Consultation Forum, we also want to point out the following recommendations:

- We propose that the **product information sheet and the user guide shall be available for 20 years** on free access websites from the last placing on the market of the given model. Moreover, PN emissions should be included in the technical information of Table 1 (Annex II in current regulation). This is an important information for urban environmental authorities to set out the use of which specific fuels or types of appliances are allowed in city districts, as some [civil society organisations](#) are calling on municipalities to take steps for stricter regulation of biomass burning.
- We also support that this information is provided with a comparison to other PN sources, such as EURO 6 diesel cars, to give the consumer a clear picture of the pollution the product can bring if not properly used.
- **Spare parts available for users** should include remote controls for all models where they are used. Besides remote controls, spare parts available to the end users shall include removable parts, e.g. parts easily removable without tools.
- The **specific indicative benchmark**, that identifies the BAT of the products in the market, is set to 5 mg/Nm<sup>3</sup> for PM. However, with the use of electrostatic precipitators, this should be set down to 1 mg/Nm<sup>3</sup> (nominal load), as many boilers have already emission well below such limit (see list of [low-emission boilers provided by German BAFA](#)).

## ECONOMICS

Biomass use in homes causes massive health burden for EU national governments: for heating and cooking purposes, [wood burning costs 12.6B€](#) in health-related expenditures. Reducing the impact of solid fuel heaters will have a tremendous health and economic benefit for Member States. The long lifetime of these appliances ([around 20 to 30 years](#)) should be taken into account in the cost calculation.

Additionally, a substantial price reduction is expected for precipitators and catalytic converters when produced in larger quantities. For instance, a [cost reduction of at least 50 % is expected for precipitators](#).

Our [cost-benefit screening](#) clearly underlines that mandating the use of precipitators for new wood boilers would be highly beneficial to society by reducing the health burden of air pollution, with benefits far outweighing the costs. Electrostatic precipitators will also reduce climate impacts from wood boilers due to reduced emission of black carbon particles.

Households affected by energy poverty, particularly in [Eastern European countries](#), are relying on these appliances. We therefore propose the following measures to be implemented in these countries alongside the ecodesign requirements to leave no one behind: 1) hardship provisions, 2) targeted funding of insulation and clean(er) individual heating technologies alternatives like heat pumps and support for precipitators, and 3) supply of inexpensive and green district heating.

Lastly, the expected savings from the public health budget can be diverted to mitigate the potential impact on energy poverty.

## CONCLUSIONS AND WAY FORWARD

In face of the huge costs and impact of biomass solid fuel boilers on the environment and the solutions available, we strongly recommend considering only policy option 31, mentioned in the Consultation Forum on December 8, 2025 (slide 41). This policy option ensures higher efficiency, inclusion of appliances for non-wood biomass and with a heat output of >500 kW as well as a significantly higher stringency level for emissions.

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