



Energy Performance of Buildings Directive [EPBD] – Analysis from Marcogaz

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ABOUT MARCOGAZ

Founded in 1968, MARCOGAZ is the technical association of the European gas industry. It represents 30 member organisations from 21 countries. Its mission encompasses monitoring and policy advisory activities related to the European technical regulation, standardisation and certification with respect to safety and integrity of gas systems and equipment, rational use of energy as well as environment, health and safety issues. It is registered in Brussels under number BE0877 785 464.

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1. Introduction

The recast of the Energy Performance of Buildings Directive (EPBD), published in May 2024, marks a pivotal moment in the European Union’s climate and energy policy. As a cornerstone of the EU Green Deal and the “Fit for 55” package, the EPBD sets out a clear trajectory for achieving a zero-emission building stock by 2050.

On 30 June 2025, the European Commission published [a comprehensive set of guidance documents](#) (in December 2024 and June 2025) to support the implementation of the revised Energy Performance of Buildings Directive (EPBD). While these guidance documents are not legally binding, they are expected to play a significant role in shaping how Member States transpose the directive into national law by May 2026.

The EPBD sets ambitious targets for the decarbonization of the building sector, including the indicative phase-out of stand-alone fossil fuel boilers by 2040 and the achievement of zero-emission buildings (ZEB) by 2050. These objectives are essential to meet the EU’s climate goals. However, the interpretation of certain provisions, particularly those related to gas-based technologies and renewable gases, has raised concerns within the gas industry and different Member States.

As the technical association representing the European gas industry, Marcogaz believes it is essential to contribute constructively to this discussion, and **essential to picture the added value that gas-based technologies and renewable gases will have in the energy transition over the next decades**. We are concerned that some interpretations of the guidance documents may lead to an uneconomic exclusion of gas-based technologies, despite their compatibility with the directive’s decarbonization objectives when powered by renewable fuels, and their potential support for a faster transition.

Marcogaz wishes to **reaffirm the role of clean gas-based technologies and renewable gases** by demonstrating how technologies such as hybrid heat pumps, absorption heat pumps, and boilers using biomethane, synthetic methane or hydrogen can support the EPBD’s objectives, particularly in existing buildings and areas where these solutions are better suited than any others.

The document is structured in two parts:

- **Part I – Interpretation of the Guidance documents:** This section provides a topic-by-topic analysis of the Commission’s guidance documents, including direct excerpts, contextual interpretation, and Marcogaz’s position. It aims to clarify what the guidance documents say— and what they do not say— about the future of gas in buildings.
- **Part II – Proposals for the Transition:** constructive and forward-looking vision for the transition, outlining feasible and technologically neutral pathways to achieve full decarbonization. A set of actionable recommendations and transition pathways that support the EPBD’s goals while preserving the role of gas-based technologies and renewable gases in a decarbonized energy system.

Marcogaz’s aim is to support the EPBD directive ambition, making it easier and faster, by ensuring that its implementation remains inclusive, pragmatic, and grounded in technological neutrality and varied feasible solutions. Gas-based technologies —when progressively powered by renewable gases— will contribute meaningfully to the decarbonization of buildings, especially in existing stock and areas where this is the best solution.

EPBD and gas-based appliances in a nutshell

- **Definition of “stand alone fossil fuel boilers”:** The guidance documents confirm that the classification depends on the fuel used, not the appliance type. This opens the door for boilers using renewable gases to remain compliant.

- **Biomethane and other renewable gases:** The guidance documents acknowledge the role of renewable gases in decarbonizing heating, especially in existing buildings and district heating systems.
- **Phase-out timeline:** The indicative 2040 phase-out target applies only to fossil fuel boilers. Appliances using renewable gases or hybrid systems are not automatically included.
- **Zero-emission buildings (ZEBs):** The guidance documents allow for multiple energy sources, including renewable gases, to supply ZEBs, provided they meet the emissions thresholds.
- **Innovative gas-based technologies:** These are explicitly recognized as transitional technologies and are not subject to phase-out, provided they significantly reduce fossil fuel use.
- **Verification mechanisms:** The guidance documents propose that compliance with fuel origin (e.g. renewable content) can be verified at installation and periodically during the appliance's lifetime.

2. Part I – Interpretation of the Guidance documents

2.1. Definition of “Stand-Alone Fossil Fuel Boilers”

One of the most consequential aspects of the EPBD guidance documents relates to the definition and treatment of “stand-alone fossil fuel boilers.” This classification has direct implications for the eligibility of heating appliances in the future building stock and the interpretation of the non-binding 2040 phase-out target.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 14**, “(...) They should strive to phase out stand-alone boilers powered by fossil fuels, and, as a first step, they should not provide, from 2025, financial incentives for the installation of stand-alone boilers powered by fossil fuels, (...)”
- **Article 13 (7)** “Member States shall strive to replace **stand-alone boilers powered by fossil fuels in existing buildings**, in line with the national phase-out plans for fossil fuel boilers.”
- **Article 17 (15)** “From 1 January 2025, Member States shall not provide any financial incentives for the installation of stand-alone boilers powered by fossil fuels, with the exception of those selected for investment, before 2025, in accordance with Regulation (EU) 2021/241, Article 7(1), point (h)(i), third indent, of Regulation (EU) 2021/1058 and with Article 73 of Regulation (EU) 2021/2115 of the European Parliament and of the Council”

[COMMISSION NOTICE on phasing out financial incentives for stand-alone boilers powered by fossil fuels under the recast Energy Performance of Buildings Directive](#)

- **4.1** “The term ‘stand-alone boiler’ is not defined in the EPBD. Recital 14 clarifies that stand-alone boilers need to be distinguished from ‘hybrid heating systems with a considerable share of renewable energy, such as the combination of a boiler with solar thermal or with a heat pump’. For the purpose of Article 17(15), a **stand-alone boiler is therefore a boiler that is not combined with another heat generator using renewable energy which provides a considerable share of the overall energy output of the combined system.**”

[EC Guidance “Fossil fuel boilers \(Article 13, Annex II\)”](#) do not provide additional explanation on the term “stand-alone fossil fuel boiler”

Interpretation:

The term “stand-alone boiler” is not explicitly defined in the EPBD. However, Recital 14 clarifies that stand-alone boilers should be distinguished from hybrid heating systems that include a considerable share of renewable energy, such as combinations of boilers with solar thermal or heat pumps. According to the Commission’s guidance document, a stand-alone boiler is one that is not combined with another heat generator using renewable energy that contributes significantly to the system’s overall energy output.

Marcogaz’s position:

Marcogaz agrees that the distinction between stand-alone and hybrid systems is essential. **“Stand-alone fossil fuel boiler” refers to individual domestic boilers that rely solely on fossil fuels.** In contrast, hybrid systems —such as those combining gas boilers with heat pumps or solar thermal, but also other efficient gas-based technologies as detailed later in [chapter 2.5](#).—offer emission reductions and should not be subject to the same phase-out provisions. This interpretation supports a technology-neutral approach and allows Member States to preserve the role of hybrid solutions in their building renovation strategies.

2.2. Biomethane and other renewable gases

The classification of a boiler as “fossil fuel” depends on the type of fuel used, not the technology itself. This principle is central to the EPBD and its accompanying guidance documents.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Article 13, 7)** “Member States shall strive to replace **stand-alone boilers powered by fossil fuels** in existing buildings, in line with the national phase-out plans for fossil fuel boilers.”
- **Article 13, 8)** “The Commission **shall issue guidance on what qualifies as a fossil fuel boiler**”

[COMMISSION NOTICE on phasing out financial incentives for stand-alone boilers powered by fossil fuels under the recast Energy Performance of Buildings Directive](#)

- **4.1** “Renewable fuels as defined in Article 2(22a) of the amended Renewable Energy Directive, i.e. ‘biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin’, are not considered fossil fuels. Both off-grid and grid-based fuels are covered by the definition of renewable fuels.”
- **4.2** “Whether a gas boiler is considered to be ‘powered by fossil fuels’ **depends on the fuel mix in the gas grid at the time when the boiler is installed**. As a general rule, where the local gas grid predominantly carries natural gas, the installation of gas boilers should not receive financial incentives. Where the local gas grid predominantly carries renewable fuels, the installation of a gas boiler may receive financial incentives under Article 17(15).

*For **off-grid boilers** not to be considered ‘powered by fossil fuels’, the competent authorities in Member States need to require and verify in a robust and credible manner that in reality the unit will operate on renewable fuels **at the time of installation and also over its lifetime**, given that the beneficiary remains in control of the fuel used in an off-grid boiler during the entire lifetime”*

EC Guidance “Fossil fuel boilers (Article 13, Annex II)”

- **4.1.** *“Pursuant to Article 2(48) of the recast EPBD, ‘boiler’ means the combined boiler body-burner unit, designed to transmit to fluids the heat released from burning.*
 - *‘Fossil fuels’ are not defined in the recast EPBD but are understood in the same manner as in Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action, which defines, in Article 2(62), ‘fossil fuels’ as ‘non-renewable carbon-based energy sources such as solid fuels, natural gas and oil’.*
 - *‘Renewable fuels’ as defined in Article 2(22a) of the amended Renewable Energy Directive, i.e. ‘biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin’ are not considered fossil fuels.”*
- **4.2** *“For this reason and in line with the technology neutrality of the EPBD, it is the fuel that is used in the boiler that defines whether a boiler is a ‘fossil fuel boiler’ or not.”*

Interpretation:

The European Commission’s guidance document on fossil fuel boilers (June 2025) explicitly states that the classification of a boiler as “fossil fuel” depends on the **type of fuel used**, not the **technology itself**.

The EPBD does not define “fossil fuel boiler” as a specific appliance category. Instead, it refers to the use of fossil fuels as defined in Regulation (EU) 2018/1999, Article 2(62): solid fuels (coal), natural gas, and oil.

Renewable fuels—such as biofuels, bioliquids, biomass fuels, and renewable fuels of non-biological origin—are explicitly excluded from this definition. The Commission’s notice on subsidies further clarifies that whether a boiler is considered fossil depends on the fuel mix in the gas grid at the time of installation. Boilers connected to grids predominantly carrying renewable gases may be eligible for financial incentives.

Marcogaz’s position:

The guidance document mentions that the phase-out applies to “stand-alone fossil fuel boilers”—that is, appliances that operate exclusively on fossil fuels. Therefore, combining the definitions for “stand-alone boiler” and “fossil fuel”, **the phase-out does not apply to:**

- **Boilers using predominantly renewable or decarbonized gases** (e.g. biomethane, hydrogen, synthetic methane).
- **Hybrid systems** (e.g. gas boiler + heat pump or other systems discussed in chapter 2.5).

This distinction is critical for national transpositions and must be preserved to ensure consistency with the directive’s principles of technological neutrality and lifecycle emissions accounting.

Many existing gas-based technologies are compatible with renewable gases or can be adapted with minimal modifications. **Blanket bans on gas-based technologies without consideration of fuel origin would undermine investment in renewable gas production and infrastructure and contradict the directive’s intent** (risk of undermining investment in renewable gas production, infrastructure and compatible technologies and result in lower biomethane uptake and higher energy prices).

Marcogaz also regrets that the guidance document on fossil fuels does not explain the criteria or methodologies to define when a mix of fossil fuel and renewable fuel is considered as “not being fossil”.

- Indeed the Commission notice on incentives explains that *“Whether a gas boiler is considered to be ‘powered by fossil fuels’ depends on the fuel mix in the gas grid at the time when the boiler is installed”* and suggests that more than half of renewable fuels is sufficient *“As a general rule, where the local gas grid predominantly carries natural gas, the installation of gas boilers should not receive financial incentives”*.
- **But the guidance document on fossil fuel boilers itself do not provide any lead to decide and do not discuss blends, the conclusion is that it is up to Member States to define this relative percentage of fossil and renewable fuels as a threshold.**

We recommend that Member States:

- **Clearly define “stand-alone fossil fuel boiler” in their national legislation and define a percentage of renewable fuel mixed in fossil fuel**, from which a gas heating system is not anymore defined as a “fossil fuel system”.
- **Exclude hybrid systems and appliances using a considerable share of renewable energy from the phase-out** (and whenever they will use it, not just at installation); also, combination of different system components with renewable sources should be considered (e.g. gas boiler + Solar + heat recovery).
- **Adopt a progressive, evidence-based approach (guarantees of origine, etc.) to reducing fossil fuel use and enable certification of the quantities used in each individual appliance**, as is today the case with electricity and in compatibility with the Renewable Energy Directive (3rd Recast) and the Gas and Hydrogen Package (2024).

2.3. Phase-out timeline

The EPBD sets an indicative target for the phase-out of stand-alone fossil fuel boilers by 2040. This provision has generated significant discussion regarding its scope and implications.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 14** *“It should still be possible to provide financial incentives for the installation of hybrid heating systems with a considerable share of renewable energy, such as the combination of a boiler with solar thermal or with a heat pump. A clear legal basis for the banning of heat generators on the basis of their greenhouse gas emissions, the type of fuel used or to the minimum part of renewable energy used for heating at building’s level should support national phase-out policies and measures.”*
- **Article 13 (7)** *“Member States shall strive to replace stand-alone boilers powered by fossil fuels in existing buildings, in line with the national phase-out plans for fossil fuel boilers.”*
- **Annex II Article 3** *“Policies and measures with regard to the following elements:*
(...) (f) the decarbonisation of heating and cooling, including through district heating and cooling networks, and the phasing out of fossil fuels in heating and cooling with a view to a complete phasing out of fossil fuel boilers by 2040; “

EC Guidance “Fossil fuel boilers (Article 13, Annex II)”

- “Article 13(7) **obliges Member States to make best efforts** to phase out stand-alone boilers powered by fossil fuels in existing buildings, in line with the national phase-out plans for fossil fuel boilers.”
- **4.3. “Member States are advised to take the following methodological steps** when drawing up their national phase-out plans, without any obligation to deploy all steps:
 - **consider whether and which measures to take for the full decarbonisation of the gas grid to the extent it will be used to heat or cool buildings in 2040;**
 - *estimate the share of boilers in the country that would be burning renewable fuels in 2040;*
 - **draw up a plan for phasing out the remaining boilers that would be burning fossil fuels in 2040.”**
- 4.3.1. “Measures for the full decarbonisation of the gas grid to the extent it will be used to heat buildings in 2040
 - *Decarbonisation of the gas grid could play a role in phasing out fossil fuels from heating and ensuring that all boilers in buildings combust 100% renewable fuels.”*

Interpretation:

Annex II of the EPBD requires Member States to outline policies for phasing out fossil fuels in heating and cooling, with a view to a complete phase-out of fossil fuel boilers by 2040. The Commission’s guidance document confirms that this is not a binding ban but a policy signal to guide national planning. Member States retain flexibility in implementation, including the use of exemptions, transitional measures, and differentiated treatment of technologies.

The 2040 deadline is best understood as a policy milestone, not a prohibition. It is intended to:

- Encourage Member States to plan for a gradual reduction in fossil fuel use in buildings.
- Show manufacturers and investors the direction of travel.
- Support the EU’s broader climate neutrality objective for 2050.

However, it does not mandate the removal of all gas-based technologies by 2040. Nor does it prohibit the installation of gas boilers that operate predominantly on renewable fuels or are part of hybrid systems, which is allowed by the EPBD Recast. The relevant prohibition is only related to providing financial incentives for stand-alone fossil fuel boilers. In that sense, the introduction of chapter 4.3.1 is misleading since it suggests that “all boilers must combust 100% renewable fuels” in 2040 (from the chapter title), which is contradictory with the indicative target of 2040.

Marcogaz’s position:

Marcogaz supports the EU’s climate objectives and acknowledges the importance of reducing reliance on fossil fuels. **However, the 2040 target should not be interpreted as a de facto ban on all boilers.** The directive allows for **fuel switching** (e.g. to biomethane) and blending as a valid compliance path. Overinterpreting the target could:

- Contradict the directive’s emphasis on technological neutrality.
- Undermine investment in renewable gas infrastructure and production facilities.
- Penalize consumers in areas where other solutions are less viable.

We recommend that Member States

- **Avoid premature bans that could disrupt the market and delay decarbonization** (segment-specific approaches are recommended).
- **Ensure that the 2040 trajectory is aligned with the availability of renewable gases and renewable and decarbonized electricity**, and the readiness of all types of infrastructure and peak dispatchable power capacity for electricity).
- **Give the opportunity to users to have any certified amount of renewable and low carbon energy used in their heating installations recognized as such** (in compliance with RED III and the Gas and Hydrogen Package provisions –this is a matter of coherence of EPBD with these two).
- **Focus on whole energy system and full life cycle complete footprints**, instead of just tailpipe considerations, and appliances for one or another technology (incomplete assumptions lead to mistaken analysis).

2.4. Zero-emission buildings (ZEBs)

The concept of Zero Emission Buildings (ZEB) is central to the EPBD recast, which sets a binding objective for all new buildings to meet ZEB standards by 2030 (2028 for public buildings). The ZEB definition emphasizes very high energy performance and minimal greenhouse gas (GHG) emission.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 20** *“The enhanced climate and energy ambition of the Union requires a new vision for buildings: the zero-emission building, with very low energy demand, **zero on-site carbon emissions from fossil fuels and zero or a very low amount of operational greenhouse gas emissions. All new buildings should be zero-emission buildings by 2030, and existing buildings should be transformed into zero-emission buildings by 2050.**”*
- **Recital 22** *“Different options are available to cover the energy needs of a zero-emission building: energy generated on site or nearby from renewable sources such as solar thermal, geothermal, solar photovoltaics, heat pumps, hydroelectric power and biomass, renewable energy provided by renewable energy communities, efficient district heating and cooling, and energy from other carbon-free sources. **Energy derived from combustion of renewable fuels is considered to be energy from renewable sources generated on-site where the combustion of the renewable fuel takes place on-site.**”*
- **Article 2, (2)** *“‘zero-emission building’ means a building with a very high energy performance, as determined in accordance with Annex I, requiring zero or a very low amount of energy, **producing zero on-site carbon emissions from fossil fuels** and producing zero or a very low amount of operational greenhouse gas emissions, in accordance with Article 11;”*
- **Article 4 (1)** *“Member States shall take the necessary measures to ensure that minimum energy performance requirements for buildings or building units are set with a view to at least achieving cost-optimal levels and, where relevant, more stringent reference values such as nearly zero-energy building requirements and zero-emission buildings requirements. The energy performance shall be calculated in accordance with the methodology referred to in Article 4. Cost-optimal levels shall be calculated in accordance with the comparative methodology framework referred to in Article 6.”*

- **Article 7 (1)** “Member States shall ensure that new buildings are zero-emission buildings in accordance with Article 11:
 - a. from 1 January 2028, new buildings owned by public bodies; and
 - b. from 1 January 2030, all new buildings”
- **Article 11 (1)** “A zero-emission building shall not cause any on-site carbon emissions from fossil fuels. A zero-emission building shall, where economically and technically feasible, offer the capacity to react to external signals and adapt its energy use, generation or storage.”
- **Article 11 (2)** “Member States shall take the necessary measures to ensure that the energy demand of a zero-emission building complies with a maximum threshold.”
- **Article 11 (7)** “Member States shall ensure that the total annual primary energy use of a new or renovated zero-emission building is covered by:
 - a. energy from renewable sources generated on-site or nearby, fulfilling the criteria laid down in Article 7 of Directive (EU) 2018/2001;
 - b. energy from renewable sources provided from a renewable energy community within the meaning of Article 22 of Directive (EU) 2018/2001;
 - c. energy from an efficient district heating and cooling system in accordance with Article 26(1) of Directive (EU) 2023/1791; or
 - d. energy from carbon-free sources.

Where it is not technically or economically feasible to fulfil the requirements laid down in this paragraph, the total annual primary energy use may also be covered by other energy from the grid complying with criteria established at national level.

EC Guidance “Fossil fuel boilers (Article 13, Annex II)”

- **4.2** “For this reason and in line with the technology neutrality of the EPBD, it is the fuel that is used in the boiler that defines whether a boiler is a ‘fossil fuel boiler’ or not.”
- **4.2** “In particular, biomethane can be used without the need for any changes in the end-user equipment employing the same pipeline and storage infrastructure.”

EC Guidance Zero Emission Buildings (Articles 7 and 11)

- **2.** “Article 11(1) states that a ZEB must “not cause any on-site carbon emissions from fossil fuels”. This means that the combustion of fossil fuels to generate energy on-site to supply the building needs within the recast EPBD scope is not allowed. “

(...) Examples:

 - The use of on-site heating systems powered by natural gas, oil and petroleum products, or coal and coal products is not compliant with Article 11(1).
 - The use of heat pumps, solar-thermal and bioenergy-based heating systems is compliant with Article 11(1).
- **3.** “Total primary energy use of a ZEB must be fully covered on an annual basis by one or a combination of the following options:
 - a. energy from renewable sources generated on-site or nearby, fulfilling the criteria laid down in Article 7 of Directive (EU)2018/20017;
 - b. energy from renewable sources provided from a renewable energy community within the meaning of Article 22 of Directive (EU)2018/2001;

- c. energy from an efficient district heating and cooling system in accordance with Article 26(1) of Directive (EU)/2023/17918; or
- d. energy from carbon-free sources.”
- **3.1.1** “Recital 22 also specifies that ‘**energy derived from combustion of renewable fuels is considered to be energy from renewable sources generated on-site where the combustion of the renewable fuel takes place on-site**’. This makes it clear that the on-site use of systems powered by bioenergy is covered. Note that bioenergy produced outside the building’s boundary will continue to be considered distant energy when calculating the energy performance and when setting the energy demand threshold of a ZEB, in accordance with Annex I of the Directive and the ISO standards indicated in Annex I (1).”
- **3.4** (...) Technical feasibility should be assessed with a view to contextual limitations and local conditions.

As an example, it might not be technically feasible to ensure 100% of supply using the options (a) to (d) due to local limitations. For example, in the case of multi-family buildings in high-density environments where the rooftop is not large enough for the use of solar thermal and an inefficient district heating system is in place, 100% compensation by on-site renewables is not technically feasible due to the lack of space (e.g. insufficient surface area for solar panels) and other solutions are not feasible (e.g. it is not possible to install heat pumps in each apartment due to space limitations, nor to install a heat pump supplying the whole multi-family building).

Interpretation:

According to the EPBD, a ZEB must:

- Have very high energy performance (low primary energy demand).
- Produce zero on-site Carbon emissions from fossil fuels.
- Generate zero or very low operational GHG emissions.

The EPBD allows Member States to define maximum thresholds for energy demand and GHG emissions, and to determine which energy sources are eligible to supply ZEBs. Recital 22 explicitly includes energy derived from the combustion of renewable fuels as eligible, provided the combustion occurs on-site. Renewable gases are explicitly included, provided they meet sustainability criteria under the Renewable Energy Directive (RED III).

A boiler operating on renewable gases such as biomethane is not considered fossil and can be part of a ZEB, as long as the building meets the required energy performance and emissions thresholds.

Further, the guidance document highlights that “*Biomethane can be used without the need for any changes in the end-user equipment employing the same pipeline and storage infrastructure*”, this reinforces the compatibility of existing gas-based technologies with renewable gases, facilitating their integration into ZEBs without costly retrofits.

Marcogaz’s position:

Marcogaz welcomes the Commission’s clarification that renewable gases are compatible with ZEBs. This interpretation aligns with the Directive’s emphasis on technological neutrality and lifecycle emissions, keeping in mind the plurality of solutions to ensure the well-being of citizen facing energy or technology choices (*Technical feasibility should be assessed with a view to contextual limitations*

and local conditions”). Biomethane, when combusted on-site, qualifies as a renewable energy source under the EPBD. No specific proof mechanism (e.g. guarantees of origin) is mandated, which provides flexibility for Member States.

Marcogaz recommends that Member States:

- **Explicitly include renewable gases (biomethane, renewable hydrogen) in their national ZEB definitions.**
- Adopt **flexible proof mechanisms** (e.g. contracts, certificates) to validate biomethane use.
- **Set clear thresholds for GHG emissions and renewable energy shares that allow gas-based systems to qualify.**
- **Define what constitutes “zero or very low” GHG emissions in operational terms** (e.g. gCO₂/kWh).
- **Resolve the conflict between the two guidance documents: on ZEB allowing for the use of biomethane and the one on energy performance certificates, which precludes assignment of the highest energy efficiency class to the buildings equipped with a gas boiler even if the consumption threshold is complied with.**

2.5. Efficient gas-based technologies

The EPBD sets a trajectory for the phase-out of fossil fuel boilers by 2040, but it does not ban gas-based technologies as a category. This has led to concerns about the future role of efficient gas-based heating technologies.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 14** *“It should still be possible to provide financial incentives for the installation of hybrid heating systems with a considerable share of renewable energy, such as the combination of a boiler with solar thermal or with a heat pump”*

[EC Guidance “Fossil fuel boilers \(Article 13, Annex II\)”](#)

- **4.3.3. Drawing up a plan for phasing out boilers that will burn fossil fuels in 2040**
 - *“Replacing individual boilers that would burn fossil fuels with other appliances may be:*
 - *a complementary pathway, in addition to decarbonising the gas grid, in order to reduce gas demand to a level that can be provided by renewable fuels; or*
 - *a stand-alone pathway to phasing out fossil fuel combustion in boilers by 2040.”*
- **4.3.2. Estimating the share of heating appliances that will burn renewable fuels in 2040**
 - *“(…) When it comes to replacing boilers in existing buildings, Member States may deploy requirements set pursuant to the recast EPBD. Pursuant to the first subparagraph of Article 13(1), Member States must set system requirements for technical building systems (which include heating systems) to be installed in buildings. In addition, the third subparagraph of Article 13(1) of the recast EPBD **introduces a clear legal basis for national bans on fossil fuel boilers by introducing requirements** related to the greenhouse gas emissions, or to the type of fuel used by heat generators or to the minimum part of renewable energy used for heating at building level.*

Examples of such requirements that may be introduced at national level with a view to phasing out boilers include:

- *a maximum specific consumption at system level (in kWh/m² for heating);*
- *thresholds for a minimum share of renewables in a heat generator (in % of the energy output);*
- *emission thresholds (in gCO₂/kWh output)."*

Interpretation

The Commission's guidance documents reiterate that the classification of a boiler depends on the fuel used, not the appliance type.

Recital 14 is a clear and direct endorsement of hybrid systems. It confirms that hybrid heating systems—those combining fossil fuel boilers with renewable technologies or renewable fuels—remain eligible for financial support, provided they deliver a significant share of renewable energy. This is a strong signal that hybrid systems are not considered “stand-alone fossil fuel boilers” and are not targeted by the phase-out measures.

The guidance document also acknowledges that Member States may pursue decarbonization through fuel substitution, appliance replacement, or a combination of both. While hybrid heat pumps are not explicitly mentioned, the EPBD includes them, and their performance characteristics—especially when paired with renewable gases—support the directive's goals.

Marcogaz's position:

Marcogaz strongly supports the EPBD's decarbonization objectives and believes that efficient gas-based technologies can play a vital role in achieving them—especially in existing buildings, rural areas, and regions with limited electrification capacity.

Efficient gas-based technologies include, for example:

- Hybrid heat pumps (gas boiler + electric heat pump).
- H₂-ready boilers (ready to run with 100% H₂).
- Absorption heat pumps (gas + solar thermal or ambient heat).
- Gas boilers operating predominantly (?) on renewable gases.
- Micro-CHP systems (engines, fuel cells...).

These systems are typically not “stand-alone fossil fuel boilers”. They are either integrated into multi-energy systems or operate on non-fossil fuels and therefore should not be subject to blanket restrictions.

Marcogaz recommends that Member States:

- **Include efficient gas-based technologies combined with a growing share of renewable gases (and hybrid systems) in financial incentive schemes and renovation plans.**
- **Ensure that performance-based requirements (e.g. emissions, efficiency) are used rather than technology bans.**
- **Recognize gas-based technologies powered predominantly by renewable fuels as compliant with EPBD objectives.**

- **Enable the certification of clean and renewable gases in appliances**, as is the case for other carriers and in accordance with the provisions of other EU Regulations (REDIII, GHP...).

2.6. Verification mechanisms

To ensure clarity and consistency in implementation, Member States must establish robust mechanisms to verify whether an appliance is powered by renewable gases.

EC Guidance “Fossil fuel boilers (Article 13, Annex II)”

- **4.2** *“For this reason and in line with the technology neutrality of the EPBD, it is the fuel that is used in the boiler that defines whether a boiler is a ‘fossil fuel boiler’ or not.”*
- **4.2** *“In particular, biomethane can be used without the need for any changes in the end-user equipment employing the same pipeline and storage infrastructure.”*
- **4.3.1.** Measures for the full decarbonisation of the gas grid to the extent it will be used to heat buildings in 2040

“(…) Decarbonising the gas grid could rely on a commitment to progressively increase the share of renewables being fed into the grid. Examples of policies and measures to ensure such a progressively increasing share of renewables in the natural gas grid include blending obligations, gas network transformation plans drawn by distribution system operators (DSOs) and/or other targets. Such measures need to be sequenced, financed and monitored”

Interpretation

The Commission’s guidance document (June 2025) emphasizes that the same boiler model may be considered fossil or non-fossil depending on its operational context. To ensure clarity and consistency, Member States must establish robust and transparent mechanisms to confirm the nature of the gas used.

Marcogaz’s position:

The revised Energy Performance of Buildings Directive (EPBD) and its accompanying guidance documents provide a framework for phasing out fossil fuels, but they also leave room for renewable gases—such as biomethane, and renewable hydrogen—to play a meaningful role in decarbonizing buildings.

Marcogaz supports the development of transparent and auditable verification mechanisms aligned with EU legislation such as the Renewable Energy Directive (RED III).

At the time of installation, the following elements can be used to verify the renewable nature of the fuel:

- A declaration from the installer or supplier specifying the intended fuel type.
- Connection to a gas grid segment with a certified minimum renewable gas share (e.g. 50%) or an engagement of the homeowner to get a gas contract with a renewable content above this threshold.
- Documentation of a fuel supply contract for off-grid renewable gases.
- Compatibility of the appliance with renewable gases, certified by the manufacturer.

These elements should be recorded in the building's energy documentation (e.g. EPC, renovation passport) and made available for inspection.

To ensure continued compliance, Member States should implement periodic verification mechanisms:

- Annual or biennial checks of fuel supply contracts and delivery records.
- Monitoring of grid injection data from network operators to confirm renewable gas blending levels.
- Use of Guarantees of Origin (GOs) or Certificates of Renewable Content issued by national registries.
- Smart metering systems that track fuel consumption and origin.

These mechanisms should be proportionate to the building's size and energy use and should not impose unnecessary administrative burden (see appendix for more details on the proposed mechanisms).

We recommend that Member States:

- **Integrate renewable gas use into EPC methodologies and renovation passports.**
- **Align ZEB criteria with RED III sustainability standards.**
- **Recognize grid-injected renewable gases** through blending obligations or certificates of origin.
- **Ensure that verification mechanisms are harmonized across regions and compatible with EU-level systems** (e.g. ERGaR).
- **Provide guidance and training to installers, certifiers, and local authorities.**

2.7. Minimum Energy Performance requirements

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 13** *“Member States should set minimum energy performance requirements for buildings and building elements with a view to achieving the cost-optimal balance between the investments involved and the energy costs saved throughout the life cycle of the building, without prejudice to the right of Member States to set minimum energy performance requirements which are more energy-efficient than cost-optimal energy efficiency levels.*

Provision should be made for the possibility for Member States to review regularly their minimum energy performance requirements for buildings in light of technical progress.”

Interpretation

Recital 13 of the EPBD (recast) establishes that Member States must set **minimum energy performance requirements** for buildings and building elements. These requirements should aim to achieve a **cost-optimal balance** between:

- The **investment costs** involved in improving energy performance, and
- The **energy cost savings** achieved over the building’s life cycle.

However, the recital also makes two important clarifications:

1. **Member States retain the right** to go beyond cost-optimal levels and set **more ambitious requirements** if they choose to.
2. There should be a **mechanism for regular review** of these requirements to reflect **technical progress** (the directive anticipates that technologies will evolve. Therefore, Member States are expected to periodically update their minimum requirements to reflect improvements in efficiency, affordability, and innovation).

Marcogaz’s position:

Marcogaz supports the principle of cost-optimality as a pragmatic foundation for setting minimum energy performance requirements. However, we emphasize the following:

- Ensure minimum energy performance standards (MEPS) are grounded in a realistic assessment of the existing building stock: **Many buildings currently lack energy labels, as they have not been sold or rented.** Therefore, Member States must first establish a comprehensive and accurate understanding of the energy performance of their building stock before setting up MEPS. This will help avoid setting targets that are technically or economically unachievable and ensure that renovation strategies are tailored to actual building conditions.
- **Technology neutrality must be preserved:** Requirements should not implicitly favor one energy vector or technology over another. For example, gas-based technologies operating on renewable fuels (e.g. biomethane, hydrogen) should be considered compliant if they meet performance thresholds.
- System-level performance should be considered: Evaluations should account for the full energy system impact, including flexibility, peak load management, and lifecycle emissions—not just tailpipe efficiency.
- Regular reviews must include gas-based solutions: As renewable gas-based technologies evolve, their contribution to building performance should be reassessed and integrated into updated requirements.

2.8. Biomethane and Hydrogen perspectives

Finally, Marcogaz would like to comment on Note 10, from the [EC Guidance “Fossil fuel boilers \(Article 13, Annex II\)”](#)

- *“Some countries already have high shares of biomethane in their grids (Denmark achieved 37.9% in November 2023), others are at earlier development stages. While the full utilization*

of the sustainable potential of biomethane could cover a growing share of current natural gas demand in buildings and, in some countries, even exceed annual demand requirements for natural gas, this is not happening at a scale that suggests that biogas and biomethane are set to become business-as-usual in heating in buildings.”

Studies from several European Associations or national stakeholders, on the opposite, show that biomethane can have a strong penetration on the market if it is supported as well as decarbonized electricity (as supported by the European Economic and Social Committee in its [Opinion of the European Economic and Social Committee – Towards a balanced European energy system \(own-initiative opinion\)](#) “*Biogas can play a key role in Europe’s decarbonisation, bioeconomy and energy transition. Member States could produce up to 40 billion cubic meters of biomethane by 2030, 101 billion by 2040 and 150 billion by 2050. The EESC urges the Commission to increase support for biogas and biomethane production*”). Biomethane is fully local in its production, stable, non-dependent on third countries technologies, and creative of local synergies (fertilizers, valorization of residuals) that directly support agriculture. Besides it can use existing infrastructure for its transport and distribution. Biogas can also be used in efficient CHPs and support not only heating but the needs of the power sector. Some national reference highlighting the potential for biomethane penetration:

- France: [Perspective gas](#)
- Spain: [Condensing boilers, an opportunity to decarbonize homes without limitations](#)
- Europe (EBA):
 - [Biomethane production potentials in the EU 2022](#)
 - [Biogases towards 2040 and beyond](#)
- World (IEA): [Outlook for Biogas and Biomethane](#)
- *“In the case of hydrogen, a meta-review of 54 studies on hydrogen heating concludes that the scientific evidence does not support the widespread use of hydrogen for heating buildings, see [A meta-review of 54 studies on hydrogen heating](#)”.*

Several countries see potential in hydrogen as part of the future energy mix for buildings: Germany, for instance, is exploring hydrogen integration through its municipal heating planning, which aims to decarbonise local heating networks using a mix of renewable and low-carbon solutions. This territorial approach allows hydrogen to be considered where electrification is difficult or where existing infrastructure can be leveraged. Almost none of the research listed in the meta study above looks at the impact of electrification system wise (see chapter 2). The EPBD guidance documents encourage Member States to adopt technology-neutral pathways, and hydrogen could be part of that mix if used strategically, it could play a role in complementing biomethane or electrification, but its efficiency, cost, and infrastructure readiness must be carefully assessed.

3. Part II – Concrete Proposals for a Technically Feasible and Inclusive Transition

Based on its analysis of the EPBD guidance documents, Marcogaz proposes a transition pathway that is ambitious, realistic, and grounded in technological neutrality. This pathway is structured around three pillars:

1. **Progressive reduction of unabated fossil gas demand.**
2. **Ramp-up of renewable and low carbon gases.**
3. **Recognition of hybrid systems and innovative technologies.**

3.1. To foster energy efficiency measures

Decarbonizing the boiler fleet cannot be achieved or does not make sense without energy efficiency efforts. Marcogaz proposes measures to reduce gas consumption in the residential sector by up to 50% by 2040, while maintaining optimal thermal comfort.

Concrete Measures:

- **Prioritize isolation and energy efficiency upgrades, where** economically feasible.
- **Promote hybrid systems** (heat pump + gas boiler, smart cogeneration, etc.) in) to provide demand flexibility, support renewable electricity integration, manage grid congestion, and reduce system costs and energy bills.
- **Deploy condensing boilers** to replace outdated equipment in existing buildings where some other alternatives (electric heat pump, hybrid heat pump, etc.) installation or renewable energy integration are not feasible (as discussed extensively in Marcogaz’s paper [An affordable, efficient, and technically feasible decarbonization of residential heating](#)).
- **Optimize installations** through room-by-room temperature regulation and hydronic balancing, as foreseen in Article 13 of the directive, or replacement of old inefficient auxiliaries (recent pumps are now covered by Ecodesign requirements).
- **Launch awareness campaigns** on the different technical possibilities of efficient heating and hot water usage installation.

3.2. Acceleration of Renewable Gas Integration

The EPBD guidance documents confirm that the classification of a boiler as “fossil” depends on the type of fuel used. Marcogaz proposes leveraging this interpretation, to allow any building equipped with a gas boiler to be considered “non-fossil” when the network or tank exceeds a defined renewable gas content (the Commission guidance document on subsidies mentioned «predominant», this threshold can be evolutive, as for blending obligation).

Concrete Measures:

- **Enable gas boilers combined with renewable gases**, especially in dwellings where installation of electrical and hybrid heat pumps is technically or economically challenging.

- **Set ambitious and realistic targets for renewable gases share in local grids by 2035**, aligned with RED III and the indicative 49% target for 2040. Adapt existing incentives, subsidies, fiscal measures or detaxation to support these trajectories.
- **Implement blending obligations** in gas distribution networks, with annual monitoring by national authorities.
- **Develop biomethane production certificates** to ensure traceability and transparency.
- **Make sure that renewable gases are not dedicated to a specific sector** (e.g. industry) to ensure the possibility for use in the heating sector and the achievement of EPBD objectives and address energy poverty and demand flexibility issues.

3.3. Recognition of Innovative Gas Technologies

Hybrid systems and efficient gas-based technologies are key transition tools, offer significant potential for reducing gas consumption through their intrinsic performances, while enhancing system flexibility and resilience. These technologies should be explicitly recognized in national transpositions and supported through incentive schemes.

Concrete Measures:

- **Explicitly exclude hybrid systems and renewable gas-ready boilers from the (indicative) 2040 phase-out scope in national transpositions.**
- **Include hybrid systems in financial incentive schemes, provided they achieve significant gas savings** ("*Minimum levels of coverage by renewable energy. For example: a minimum 60% coverage*") and can react from signals from the grids as requested by EPBD, to optimize renewable electricity integration, and manage grid congestion during extreme events such as a cold snap or Dunkelflaute.
- **Support absorption technologies in tertiary and multi-family buildings.** Make sure that they are treated equally as other energy vector-based technologies (technology neutrality).
- **Include hybrid systems in energy performance calculations (white certificates, etc.) and ZEB certifications, based on current energy mix** (meaning that all energy vectors should be evaluated through the same methodology, for primary energy and CO2 content).

3.4. Thinking system-wide: a prerequisite for a successful transition

The Energy Performance of Buildings Directive (EPBD) rightly focuses on improving the energy performance of individual buildings. However, to ensure a coherent and effective transition, the European Commission must also adopt a system-wide perspective—one that considers the interactions between buildings, energy networks, industrial demand, and the broader energy system.

Decarbonizing buildings cannot be achieved in isolation. The choices made at the building level—such as the deployment of heat pumps, hybrid systems, or gas boilers operating on renewable fuels—have direct implications for electricity and gas networks, peak demand management, and energy security. A system-wide approach is essential to avoid unintended consequences and to unlock synergies between sectors. The Directive also supports the need to go beyond system or building and think “system-wide”.

[Directive \(EU\) 2024/1275](#) of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast)

- **Recital 38** “The ‘energy efficiency first’ principle is an overarching principle that should be taken into account across all sectors, going beyond the energy system, at all levels. It is defined in Article 2, point (18), of Regulation (EU) 2018/1999 as meaning to **take utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand-response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decisions.** The principle is therefore equally relevant with regard to improving the energy performance of buildings and is highlighted in the Renovation Wave strategy as one of the key principles for building renovation towards 2030 and 2050. As set out in Commission Recommendation (EU) 2021/1749 ⁽¹⁸⁾, improved health and well-being are among the major co-benefits of applying the ‘energy efficiency first’ principle to improve the energy performance of buildings.”

Coordinating Demand and Supply Trajectories

The ramp-up of renewable gas production is a cornerstone of the transition. Blending obligations and green gas contracts can create the necessary demand pull, but even with favorable business conditions, scaling production will take time. Reaching 50% renewable gas share by 2040 (“predominant”) and 100% by 2050 is ambitious but achievable—provided that demand signals are clear and stable. Without intermediate binding targets, the cost of the switch to 100% renewable gases would be too high for the customers (residential, commercial or industrial).

Hybrid systems offer a pragmatic pathway to reduce gas demand in buildings by a factor of 4 to 5. With appropriate retail electricity price signals, these systems can shift peak demand from electricity to gas, or vice versa, depending on system needs. This flexibility is particularly valuable for managing seasonal and daily peaks, and for ensuring that dispatchable power production remains efficient.

Achieving the EU’s climate neutrality objective by 2050 requires not only ambitious sectoral targets but also a coherent regulatory framework. While the EPBD sets binding goals for the decarbonization of buildings, other legislative instruments—such as the Ecodesign Regulation—govern the performance and market access of energy-related products, including heating appliances. If these regulations evolve in isolation, there is a risk of misalignment that could undermine the effectiveness of national transpositions and delay the transition. For example, EPBD may allow the continued use of gas-based technologies powered by renewable fuels, while Ecodesign criteria could restrict their marketability based on efficiency thresholds that do not account for fuel origin or system-level performance.

By ensuring coherence between EPBD and Ecodesign (and other relevant European legislations), the European Commission can unlock synergies, reduce implementation risks, and accelerate the deployment of clean, flexible, and affordable heating solutions across Europe, while ensuring social sustainability.

Leveraging Flexibility and Storage

Europe benefits from substantial gas storage capacity, which can be repurposed for renewable gases. hybrid heating systems add another layer of flexibility, allowing buildings to switch between electricity and gas based on availability and cost. This capability is critical in scenarios of supply disruption or price volatility.

In case of severe shortages, hybrid systems can help balance the energy system by enabling the use of either imported electricity or gas. This flexibility reduces the risk of rationing and enhances resilience.

For industrial consumers, hybrid systems can also reduce energy bills by optimizing fuel use based on market conditions.

Supporting Industrial Competitiveness

Energy-intensive industries face unique challenges in the transition. While some may benefit from carbon border adjustment mechanisms (CBAM) or carbon capture and storage (CCUS), others will require tailored solutions. Hybrid systems can offer cost-effective flexibility, while EU-level rules may be needed to safeguard competitiveness. Without such measures, there is a risk of increased reliance on imports from regions with lower energy costs and less stringent climate policies.

3.5. Recommendations for National Transposition

Marcogaz encourages Member States to:

- **Adopt a pragmatic reading of the guidance documents**, focusing on whole energy system aspects and full life-cycle emissions and footprints, rather than appliances and tailpipe aspects.
- **Set progressive trajectories** ahead of the 2050 carbon neutrality goal and **intermediate milestones** (e.g. 2030, 2035, 2040) to monitor progress, particularly for the expansion of renewable gases (local, stable, synergistic).
- **Avoid blanket bans**, which risk stifling innovation, blocking environmental solutions that are fit for purpose, and penalizing households and industries.
- **Foster technological diversity and neutrality**, by integrating gas-based technologies into renovation plans and network development scenarios. Make sure that energy regulatory officers support **technologies penetration based on efficiency and emissions, while ensuring a cost-effective access to customers**.
- Require fuel suppliers and network operators to report renewable content transparently and possibly consideration of “green-gas-regulations” with an increasing share of renewable gases in the grid (as currently discussed in Germany).
- **Integrate renewable gases recognition into EPC methodologies, existing buildings and ZEB compliance frameworks** (by using existing tools like guarantees of origin, blending obligations, etc.).
- Provide guidance to installers, certifiers, and local authorities on how to verify renewable fuel use in practice.
- Promote the use of certification for renewable energy use in buildings (also for gas).
- Make sure MSs use the same primary energy calculation methodology by energy vector as asked by EPBD (article 4 and Annex 1).

4. Appendix 1: Verification Mechanisms

a. Certificates of Origin and Guarantees of Origin (GOs)

- These are market-based instruments that certify the renewable origin of a given volume of gas.
- GOs can be used to demonstrate that a building is supplied with renewable gas, either through direct injection into the grid or via contractual arrangements (e.g. green gas purchase agreements). For gas, these will be included in the Union Database as per REDIII.
- National registries and EU-wide platforms (e.g. ERGaR) can support traceability.

b. Blending Obligations and Grid Mix Monitoring

- In areas where renewable gases are injected into the gas grid, blending obligations can ensure a minimum share of renewable content.
- If the renewable share exceeds a defined threshold (e.g. 50%), all appliances connected to that grid segment could be considered “non-fossil” for regulatory purposes.
- This approach requires regular monitoring and reporting by gas network operators.

c. On-Site Storage and Delivery Verification

- Fuel suppliers should provide documentation on the renewable content and sustainability of the fuel, in line with RED III criteria.
- Periodic checks (e.g. during maintenance or EPC renewal) can ensure continued compliance.

d. Smart Metering and Digital Tracking

- Smart meters and digital platforms can track the actual consumption of renewable fuels over time.
- This data can be integrated into energy performance certificates (EPCs) and renovation passports to reflect the building’s decarbonization trajectory.