

Guidance document on the revised Articles 14 and 15 EPBD

Inspection of heating systems and air conditioning systems

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1. INTRODUCTION ARTICLE 14 – HEATING SYSTEMS

Article 14 of **Directive 2010/31/EU on the Energy Performance of Buildings as originally adopted on 19 May 2010**¹ (hereafter referred to as the "former EPBD") established inspection requirements for heating systems with a rating over 20 kW. Member States had to fix inspection frequencies according to the type of the system, effective rated output, costs of inspections and estimated energy savings. Heating systems with an effective rating over 100 kW had to be inspected at least every 2 years. Member States could also allow for reduced inspection frequency in for systems with electronic monitoring and control systems in place. As an alternative to inspections, Article 14 paragraph 4 allowed Member States to opt to take measures to ensure the provision of advice to users concerning the replacement of boilers, other modifications to the heating system and alternative solutions to assess the efficiency and appropriate size of the boiler. The overall impact of this approach had to be equivalent to that arising from inspections.

Article 1 of **Directive (EU) 2018/844 amending Directive 2010/31/EU on the energy performance of buildings**² and **Directive 2012/27 on energy efficiency** replaces the provisions concerning inspection in Article 14 of the 2010/31/EU (hereafter referred to as "the revised EPBD").

As per the provisions of the revised EPBD, heating systems or combined heating and ventilation systems of, or under, 70 kW effective rating no longer require inspections. Heating systems or combined heating and ventilation systems with an effective rating over 70 kW should still be inspected at regular intervals. The revised EPBD allows for exemptions for systems under energy efficiency contractual arrangements (or similar), systems operated by a utility or a network operator, systems in non-residential buildings equipped with automated and control systems or systems in residential buildings with specific monitoring and control functionalities.

In addition, the revised EPBD introduces two new requirements. The first requirement is that in combined heating and ventilation systems, the ventilation should also be included in the inspection. Second, systems over 290 kW are required to have Building Automation and Control Systems (if technically and economically feasible).

In summary, the main differences with respect to inspection requirements introduced under the revised EPBD are: 1) the different thresholds for inspections, 2) the inspection of the ventilation system for combined heating and ventilation systems, 3) a greater focus on normal operating conditions and 4) greater role for building automation and control systems (BACS) and electronic monitoring and control systems.

¹ Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

² Directive (EU) 2018/844 of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

As an alternative to inspections, Article 14(3) of the revised EPBD includes the possibility for Member States to opt to take measures to ensure the provision of advice to users. The provisions of the revised EPBD with regards to alternative measures are similar to those originally laid out in the former EPBD.

However, Member States that choose to apply alternative measures must ensure that they are equivalent to the inspections under the provisions of Article 14 of the revised EPBD (this includes elements such as new thresholds, combined heating and ventilation systems, exemptions, etc.).

Member States have taken different routes in the application of inspections or alternative measures. Fifteen Member States have applied inspections for both types of systems. Six Member States have applied alternative measures for heating systems and inspections for air conditioning systems. Finally, seven Member States have applied alternative measures for both heating and air conditioning systems. The provisions on Article 14 (heating systems) and Article 15 (air conditioning system) are very similar and the guidance could have treated both articles together. However, because the approach in Member States is different, it has been decided to keep Articles 14 and 15 separated for the purposes of this Guidance note.

The aim of this guidance document is to clarify the purpose of the revised provisions in Articles 14 and 15 of the revised EPBD. The note states the views of the Commission services, does not alter the legal effects of the Directive and is without prejudice to the binding interpretation of Articles 14 and 15 as provided by the Court of Justice.

2. UNDERSTANDING OF ARTICLE 14 (SCOPE)

2.1. Aim and objectives

The main aim of an inspection is to evaluate the performance of a system. Inspections should also identify issues or problems, propose solutions or improvement measures and log the results of the inspection in a report for future reference.

2.2. Heating and combined heating and ventilation systems - Article 14 (1)

The revised EPBD expands the scope of inspection to also include the ventilation part of combined heating and ventilation systems.

For those Member States which already have inspection regimes in place, the scope of the heating system itself should have already been defined in the context of the transposition. It should include all accessible parts such as: the heat generator, control system and circulation pumps.

The revised EPBD in addition requires the inspection of the ventilation in combined heating and ventilation systems. Since this is a new requirement, Member States will have to define the types of systems that will now be considered as combined heating and ventilation systems.

Systems can be categorised in 3 different types, as follows:

1. Ventilation systems connected to the heating system – Systems where the ventilation system is composed of one or more Air Handling Units (AHU) delivering treated air to the heated space(s) and where these AHUs are connected to one or more heat generators in order to use its heat to treat the air. Examples of this type of systems: boiler + AHU + terminal units (fan coils/fan convectors/radiators) or boiler + Variable Air Volume systems.
2. Ventilation systems coordinated with the heating system – Systems where there are one or several air handling units delivering treated air to the heated space(s). The ventilation system is connected to an independent heat source (e.g. dedicated boiler or heat pump) or uses an internal heat source (e.g. electrical resistance). Space heating is mostly provided by a system which uses a different heat source. Even though the heating and the ventilation systems do not share heat sources, they operate in an integrated and coordinated manner (e.g. schedules, flow temperatures or flow rates). Examples of this type of system: rooftop units (Variable Refrigerant Volume or Variable Refrigerant Flow) + AHUs.
3. Ventilation systems independent from the heating system – Systems where the ventilation system is completely independent from the heating both in terms of heat source and operation. Examples of this type of system: extract only systems, supply & extract (without pre-heat).

Type 1 systems would fall within the scope of the revised EPBD. Regardless of the share of heat used by the ventilation system, both the heating and the ventilation system are fully

involved in the delivery of the heat within the building. This type of systems require careful integration between ventilation and heating to adequately provide for the indoor environment in the most efficient manner, particularly under typical or average operating conditions. Inspection of such systems would offer good opportunities for identifying energy saving opportunities at a reduced cost (low hanging fruit). In conclusion the requirements of the revised EPBD apply (Recital 35 of Directive (EU) 2018/844 helps establish this).

Type 2 systems should also be treated as a combined heating and ventilation system. This is mainly because of the need to adequately integrate the operation of the heating and ventilation systems. Similarly to Type 1 systems, an inspection offers good opportunities for identifying energy savings opportunities with a reduced implementation cost.

Type 3 systems are not considered combined heating and ventilation systems. The heating system and the ventilation system must be dealt with as individual and separate systems for the purposes of the revised EPBD.

In general Types 1 and 2 are more common in non-residential buildings (such as offices, shopping centres, etc.), whereas type 3 systems are more common in residential buildings.

The effective rated output of a combined heating and ventilation system will be the sum of the effective rated output of the different heat generators installed in the system.

For example: boiler, heat pump, electric resistance, solar thermal panels, etc. This must be taken into consideration for the purposes of establishing whether a system falls above or under the 70 kW threshold for inspections.

The calculation of the effective rating of a system depends on the type of system. In Type 1 and type 3 systems, the size of the heat generator is the determining factor. In Type 2 systems, the size of the heat generator must be added to the size of the separate heat generator in the ventilation system (e.g. electric heaters, solar thermal panels, etc.). This is because the heating capacity of both elements is used to compensate for the heat losses in the treated space.

The revised EPBD does not specify the extent of the inspection with regards to the purely air management and treatment aspects of the system (such as ductwork, dampers or air filters). However, it would be good practice that the independent expert still includes them in the inspection, at least to a certain degree, based on the accessibility of the system and the energy saving opportunities available. In practice, in a combined heating and ventilation system, the different parts of the system may be located together or in close proximity. Since the inspector is physically visiting the building, the added workload and cost are limited, while the saving opportunities are good.

2.3. Combined heating and air conditioning and ventilation systems

It is common for a ventilation system to be connected to both the heating and the air conditioning system.

In Member States that have decided to implement inspections for both heating and air-conditioning systems, the ventilation could be subject to a double inspection (once with the heating system and once more with the air-conditioning system). This scenario of double inspections should be avoided in order to limit the burden on the building owner or user.

Combined heating and air-conditioning and ventilation systems should preferably be inspected in a single visit by an expert qualified to inspect both heating and air-conditioning systems. Failing that, it would be recommendable that the ventilation system is inspected by an expert qualified to carry out inspections in air-conditioning systems.

In Member States that have decided to implement inspections for one type of system and alternative measures for another, the risk of double inspection does not exist. However, the inspection should ensure that the heating or cooling cycle in the ventilation system do not fight each other.

For the purposes of establishing if a system is over or under the 70 kW threshold, the respective heating and cooling effective rated output should in this case be considered separately. For example, a combined heating and air conditioning system with a heating rated output of 50 kW and a cooling rated output of 30 kW would be below the threshold for both heating and air conditioning inspections. A combined system with a heating rated output of 80 kW and a cooling rated output of 30 kW would be over the threshold for heating inspections, but below the threshold for air-conditioning inspections.

The reason for this treatment is because the EPBD treats heating on the one hand and air conditioning systems on the other hand separately (Article 14 and Article 15 respectively). There are no provisions in the revised EPBD for the purposes of treating such systems together. Consequently, even though in practice such combined systems may well exist, they nonetheless have to be treated separately, with their respective inspection requirements, reporting obligations, periodicity, certification of inspectors, etc.

2.4. Heat pumps and rooftop units

Heat pumps are defined in Article 2(18) of the revised EPBD as "*a machine, a device or installation that transfers heat from natural surroundings such as air, water or ground to buildings or industrial applications by reversing the natural flow of heat such that it flows from a lower to a higher temperature. For reversible heat pumps, it may also move heat from the building to the natural surroundings*". Heat pumps are therefore capable of acting as the generators for both heating and air conditioning systems, although in some applications they may provide only one or the other. Because of this capacity to provide both heating and cooling, heat pumps could fall under the provisions of both Article 14 and Article 15.

If a heat pump is used as the heat generator in a system that provides only heating, then the system should fall under the provisions of Article 14. For example, this would be the situation of a heat pump generating heat for heating and domestic hot water.

If a heat pump is used as the heating or cooling generator in a system that provides both heating and air conditioning, then the system should fall under the provisions of Article 15.

Rooftop units are a special category of heat pumps commonly used in relatively large non-residential buildings. They work as heat pumps with the added capability of providing heating and cooling simultaneously. They should always be considered as falling under the provisions of Article 15.

2.5. Performance under typical or average operating conditions

Recital 26 of the former EPBD indicated that *"regular maintenance and inspection of heating and air-conditioning systems by qualified personnel contributes to maintaining their correct adjustment in accordance with the product specification and in that way ensures optimal performance from an environmental, safety and energy point of view"*. Article 14(1) of the former EPBD provided that the inspection should include an assessment of the boiler sizing compared with the requirements of the building.

However, the revised EPBD refers not only to the boiler, but to the system as a whole and in particular the heat generator. Therefore, under the revised EPBD there is a greater emphasis on normal operating conditions. Recital 36 of Directive (EU) 2018/844 indicates that it makes sense for inspections to focus on real-life use conditions, with varying operating conditions that may require only a part of the nominal output capacity. This is because only a small fraction of the energy consumption in a heating system takes place under conditions approaching design conditions. Instead, the greatest proportion of the energy consumption is when the system is running under part load. Therefore, the objective should be to ensure that the system can perform efficiently and effectively under all conditions.

Article 14(1) of the revised EPBD requires that the inspection of heating systems includes (where relevant), an assessment of the capabilities of the heating system to optimise its performance under typical average operating conditions. Member States must update their legislation to ensure that this performance assessment is included in the scope of inspections.

The operation of a heating system depends on many factors, including: outdoor conditions, building characteristics, building use and system characteristics. It is complex and possibly not practical to define typical or average operating conditions for all possible combinations.

Systems rarely operate at full capacity, operating instead at what is known as part load. It would be possible to provide some rough guidelines on typical or average operating conditions based on the % of output of a system over a given period. For example, as a rule of thumb it could be determined that typical or average conditions result in a system operating between 20% and 40% of its design output over a period of time (e.g. a day).

However, this provides an incomplete picture. Even in a typical or average day, the most efficient settings for a system may differ substantially throughout the day. As a result, it would not be recommendable to define typical or average operating conditions as a function of system load in the national legislation.

It would also be possible to provide some general guidelines for defining typical or average operating conditions based on outdoor temperature and how this one differs from design conditions. For example, if design conditions were set at -10 °C, it would be possible to define typical or average operating conditions as a function of a less demanding outdoor temperature (e.g. between 5 and 10 °C) or based on temperature difference between inside and outside (e.g. 60% of temperature difference between inside and outside design conditions). However, the same system may behave completely differently depending on the building where it has been installed, how it is used or the weather at a specific moment. As a result, it is not recommended that typical or average operating conditions are defined or tabulated as a function of outdoor conditions (e.g. standard day) in national legislation. The same could be said with regards to building characteristics or building usage (e.g. 80% occupancy).

The technical details on how to carry out the assessment can be laid out in the training or documentation provided to inspectors.

The need to account for the operation of systems under typical or average conditions is well understood by technical bodies and associations. There are a number of published manuals and guidelines to address performance of systems under part load (as opposed to full load or design load). It is recommended that Member States follow or use these guidelines when developing the relevant training material.

Relevant examples for Article 14(2)	
iSERV guide on – Inspection methodology – Air conditioning maintenance tasks – Identifying energy services http://www.iservcmb.info/sites/default/files/res ults/Physical-Inspections/Public-report-Methodology-for-HVAC-System-Inspections.pdf	Technical guide for performing inspections of air-conditioning systems. iSERV project – EC funded
REHVA – Capacity control of heat pumps https://www.rehva.eu/publications-and-resources/rehva-journal/2012/052012/capacity-control-of-heat-pumps-full-version.html	Technical paper on improving the performance of heat pumps in working conditions

2.6. Building Automation and Control Systems (BACS) – Article 14(4)

See guideline on Article 8 TBS and BACS.

2.7. Electronic monitoring and effective control functionalities in residential buildings – Article 14(5)

Electronic monitoring and effective control functionalities in residential buildings can lead to significant energy savings, improve the management of the indoor environment and be beneficial to building owners and users. This is particularly the case for large buildings, where access to system controls or system information is more limited for most users.

The provision in Article 14(5) recommending electronic monitoring and control functionalities expressly covers only residential buildings. It is up to Member States to decide whether they will opt to establish such requirements for residential buildings, introducing them into their national transposition measures.

Article 14 (5) a) refers to the provision of continuous electronic monitoring. Such system should be able to take measurements of energy consumption of the system and use these to calculate the performance. This performance should then be made available to the owner or manager of the system. If the performance of the system falls significantly or if there is a service need, the system should notify the owner or manager of the system. The system should operate in a continuous basis, as opposed to a periodical basis (e.g. every 3 months).

In addition, Article 14 (5) b) refers to the provision of effective control functionalities to ensure optimum generation, distribution, storage and use of energy. These control functionalities should take into consideration the scenario of a multi-apartment building with a single heating system, where the individual users should only be able to control the system within the boundaries of their building unit.

Article 14 (5) refers to the optional introduction of both functionalities for the case of residential buildings.

Unlike Article 14 (1) and Article 14 (4), which provide for specific thresholds for the purposes of triggering the respective mandatory obligations to be reflected in national transposition measures, Article 14 (5) has optional character ('may') and therefore does not include details on thresholds in terms of effective rated output and implicitly refers to all residential buildings regardless of their size. It is recommended that Member States take into consideration the differences in types of systems or buildings when laying down the requirements.

2.8. Exemption from the requirements laid down in Article 14(1) – Article 14(2) and 14(6)

The former EPBD allowed the possibility for Member States to reduce the frequency of inspections or lighten them as appropriate where electronic monitoring and control systems were in place.

The revised EPBD allows for the introduction of several exemptions if the technical building system is covered by an energy performance contracting (or similar) or is operated by a utility or a network operator – Article 14(2) – or if the heating system has specific control and monitoring features as defined in paragraphs 4 and 5 of Article 14 – Article 14(6).

Article 14(2)

Article 14(2) of the revised EPBD excludes from inspections those technical building systems that are covered by an agreed energy performance criterion or a contractual arrangement specifying an agreed level of energy performance improvements. An energy performance contract as defined in point (27) of Article 2 of Directive 2012/27/EU of the European Parliament and of the Council would fulfil these requirements.

Those buildings operated by a utility or network operator and that are therefore subject to performance monitoring on the system side may also be exempt.

The exemptions indicated in Article 14(2) only apply if the overall impact of the approach is equivalent to that resulting from the application of inspections indicated in Article 14(1).

The revised EPBD does not indicate how this equivalence should be established. One possibility could be to determine whether the technical building system, as part of the contract or agreement, is already undergoing a regular inspection that is similar in nature to the inspections under Article 14(1). If the technical building system undergoes such inspection, an exemption from the requirements laid down in Article 14(1) could be established. It is safe to assume that most energy performance contracts or agreements already include some level of regular inspection.

However, the full extent of such inspections may not be completely in line with the requirements of the revised EPBD. Under normal circumstances, it would not be feasible for Member States to individually check each energy service contract to determine whether they are equivalent or not. In addition, since such contracts may be signed by 2 private companies, the terms and conditions may differ widely between contracts. As a result, Member States may decide to streamline and normalise such contracts.

Article 2(27) of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency³ (hereafter referred to as "the EED") defines energy performance contracting as 'a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings'.

³ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency.

Amongst other measures the EED also introduces provisions on energy services. Article 16 asks Member States to (where necessary) develop certification and/or accreditation schemes.

Article 18 of the EED also asks Member States to support the public sector by providing model contracts for energy performance contracting. These model contracts should include at least the items which are listed in Annex XIII.

For the purposes of the equivalence requirements indicated in Article 14(2) of the revised EPBD, energy performance contracts signed by an accredited/certified company which follows a model such as the one indicated by Annex XIII could be considered to have an equivalent impact to inspections.

Member States would therefore need to have a publicly available list of accredited or certified companies together with publicly available model contracts.

For the purposes of record keeping, the status of a system exempt from inspections due to an energy performance contract should be recorded in the inspection database. This should include a reference to the duration of the contract and therefore, the period for which the exemption applies.

In those Member States where there are no publicly available model contracts and a list of accredited or certified companies, authorities will need to check contracts individually to verify whether there is equivalence or not. This could be facilitated by the contracting parties with the addition of an Annex to their contract, clearly and unequivocally indicating at least the following points listed in Annex XIII of the EED:

- Guaranteed savings to be achieved by implementing the measures of the contract;
- Duration and milestones of the contract terms and period of notice;
- Reference date to establish achieved savings;
- Obligation to fully implement the measures in the contract and documentation of all changes made during the project;
- Clear and transparent provisions on measurement and verification of the guaranteed savings achieved, quality checks and guarantees (ideally with reference to national or EU standards).

Relevant examples for Article 14(2)	
Italy – Standard UNI CEI 11352	Italian Standard for - General requirements, check lists for the verification of the organization's requirements and the contents of the service offer Includes checklist and specific references to

	Annex XIII of the EED
UNE 216701 – Clasificación de proveedores de servicios energéticos	Spanish standard for the classification of providers of energy services
Spain – Guide for the drafting of Documents of Administrative and Technical Clauses for the Energy Performance Contracting with guaranteed savings subject to harmonized regulation (Service Contracts) http://icaen.gencat.cat/web/.content/10_ICAEN/18_actuacio_internacional/Enllacos/Arxius/20180717_EPC_Public_Tendering_GUIDE.pdf	Guide for tendering procedures of energy performance contracts by the
Spain – Modelo de contrato de rendimiento energético con inversión adaptado a la le 9/2017 y a la guía de tratamiento estadístico de Eurostat	Example of contract model
Slovenia - Oris Vzorca Pogodbe (http://www.energetika-portal.si/podrocja/energetika/energetska-prenova-javnih-stavb/projekt-na-pisarna/)	Example of contract model

Article 14(6)

Article 14(6) of the revised EPBD introduces exemptions for those buildings that comply with the requirements of Article 14(4) and Article 14(5).

According to Article 14(4), buildings with heating or combined heating and ventilation systems with an effective rated output of over 290 kW must have (wherever technically and economically feasible) BACS installed by 2025.

It is important to note that BACS is a commonly used term in the building industry, generally used to refer to the electronic system that controls the technical building system. The BACS system as described in Article 14(4) includes a series of characteristics not usually found in most systems already installed or available in the market. Therefore, the definition of BACS to be introduced in national legislation should clearly address the differences.

Buildings with systems between 70 kW and 290 kW effective rated output are not affected by the requirement to have BACS installed. Member States may decide to lower the threshold and require heating systems with smaller systems to also have BACS installed. Those buildings under the new requirement and with BACS installed must also be exempt from inspections.

Individual building owners may decide to install a BACS that is in compliance with the substantive requirements set out in Article 14(4). Under these circumstances Member States may decide to exempt them even if they do not reach the 290 kW threshold. If Member States

take this decision, they should however communicate it in the transposition of the revised EPBD.

Article 14(5) introduces the possibility for Member States to ensure that residential buildings are equipped with continuous electronic monitoring and effective control functionalities. In a similar scenario to BACS, some of these elements may already be present in the market in some form or other. However, they might not completely fulfil the requirements indicated in Article 14(5). Therefore, the definition of these systems and how they are introduced in national legislation should clearly address the differences.

As indicated in recital 39 of Directive (EU) 2018/844, Member States may choose to continue applying the inspection regimes which are already in place. Nevertheless, the exemptions applicable under Article 14(2) and article 14(6) must still be considered.

2.9. Alternative measures – Article 14(3)

Article 14(3) of the revised EPBD allows Member States to take measures to ensure the provision of advice to users concerning the use of heating systems or combined heating and cooling systems.

Although the provisions on alternative measures as such are not extensively modified, they are subject to the changes in the provisions in the other paragraphs of Article 14. The different provisions have different effects.

The introduction of the new threshold (70 kW) in the revised EPBD means that those Member States that decide to apply alternative measures must apply these measures to the systems covered by the new threshold. This should result in a reduction on the number of systems to be covered by the alternative measures and, in turn, result in a reduction on the energy savings target.

The provision on combined heating and ventilation systems increases the scope for those systems that should be inspected. This should result in an increase of the potential savings per system, which would in turn result in an increase on the energy savings target to be achieved.

The provisions on exemptions due to Article 14(2) – exemptions due to systems covered by energy performance criteria – and Article 14(4) – exemptions due to systems with BACS – would also result in a reduction in the number of inspections.

Member States may lay down requirements on electronic monitoring and enhanced control functionalities in residential buildings. Buildings covered by this type of system would be exempt from inspections. As a result, those Member States applying alternative measures would need to exclude this group of buildings should they decide to apply said requirements.

The range of measures that Member States may take in order to apply Article 14(3) has not changed.

Member States must document any changes to the alternative measures via a report submitted to the Commission. This reporting must be effected before the measures are applied.

Such a report shall be submitted to the Commission as part of the Member States' integrated national energy and climate plans referred to in Article 3 of Regulation (EU) 2018/... .."⁴;

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⁴ Introduce reference to Governance when available.

3. GUIDELINES FOR IMPLEMENTING PROVISIONS ON INSPECTIONS FOR HEATING AND COMBINED HEATING AND VENTILATION SYSTEMS IN ARTICLE 14 OF THE REVISED EPBD

3.1. Ensure correct transposition of Article 14 - Inspections

3.1.1. Systems to be inspected

The revised EPBD expands the scope of systems to be inspected under the provisions in Article 14(1) to include combined heating and ventilation systems.

Member States have to ensure that the definitions of heating system and of combined heating and ventilation system are correctly transposed in the national legislation.

Member States have to ensure that the definition of such systems also includes the case of heat pumps and to determine whether they fall within the scope of Article 14 or 15 of the revised EPBD (see 2.3 above).

3.1.2. Effective rated output

Article 14(1) of the revised EPBD establishes the provision for inspections in systems over 70 kW of effective rated output. This is a change from the threshold of 20 kW of boiler's effective rated output indicated in Article 14(1) of the former EPBD.

This change affects both the output rating (from 20 kW to 70 kW) and also the content of the rating itself. Under the former EPBD the rating made reference only to the boiler, while the rating in the revised EPBD makes reference to the system as a whole. Systems with multiple heat generators (e.g. Type 1 and Type 2 systems as described in 2.2 above) would also fall under the obligation of Article 14 (1) of the revised EPBD, if the overall rating of the multiple heat generators serving the same area or building unit exceeds 70 kW.

Member States in principle have to amend their national legislation and inspection regimes so as to take into account these new ratings. However, as indicated in recital 39 of Directive (EU) 2018/844, Member States may choose to continue applying the inspection regimes which are already in place, including inspections for smaller heating systems (i.e. of a threshold between 20 kW and 70 kW of effective rated output). If Member States decided to continue to operate those schemes, there would be no obligation on Member States to notify those more stringent requirements to the Commission.

3.1.3. Performance under typical or average operating conditions

Member States must update the scope of the inspection to include the assessment of the system under typical or average operating conditions.

Member States have to determine the changes required in the inspection methodology. In particular this should focus on inspection requirements and guidelines.

3.1.4. Exemptions based on energy contracts or agreements

Member States may update their national legislation to include exemptions for those buildings covered by an agreed energy performance criterion or a contractual arrangement specifying an agreed level of energy performance improvements. Member States may also include exemptions for those buildings operated by a utility network or operator.

If Member States decide to allow for such exemptions, they have to ensure that new legislation addresses the definition of "energy performance criterion" or "contractual arrangement specifying an agreed level of energy performance".

In case Member States decide to include the exemptions indicated under Article 14(2), they must ensure that the overall impact of the approach is equivalent to those of inspections resulting from Article 14(1).

In order to ensure this equivalence, it is recommended that Member States make use of the possibilities to implement Article 18 of the EED by creating a publicly available list of certified / accredited companies. In addition, Member States would need to produce publicly available models for energy performance contracts in line with Annex XIII of the EED.

For those Member States without list of certified / accredited companies or without publicly available models for energy performance contracts, the equivalence would need to be established on a case by case basis. Under this scenario, the contracting parties could facilitate the process by introducing an Annex in their contract clearly identifying the following points from Annex XIII of the EED:

- Guaranteed savings to be achieved by implementing the measures of the contract
- Duration and milestones of the contract terms and period of notice
- Reference date to establish achieved savings
- Obligation to fully implement the measures in the contract and documentation of all changes made during the project
- Clear and transparent provisions on measurement and verification of the guaranteed savings achieved, quality checks and guarantees (ideally with reference to national or EU standards).

3.1.5. Requirements on BACS

See guideline on Article 8 TBS and BACS.

3.1.6. Voluntary requirements for residential buildings

Article 14 (5) refers to the optional introduction of both functionalities (electronic monitoring and effective control functionalities) for the case of residential buildings.

Member States that decide to introduce the requirements for residential buildings should introduce a clear definition of the meaning of continuous electronic monitoring and effective control functionalities.

Article 14 (4) has optional character ("may") and does not include details on thresholds in terms of effective rated output. Instead it implicitly refers to all residential buildings regardless of their size. It is recommended that Member States take into consideration the differences in types of systems or buildings when laying down the requirements.

3.1.7. Exemptions based on BACS or continuous electronic monitoring and effective control functionalities

The revised EPBD introduces the exemption of inspections to those technical building systems that are in compliance with article 14(4) (BACS) and 14(5) (Voluntary requirements for residential buildings).

Member States must update national legislation to introduce the definition of BACS (as discussed in 3.1.5).

Member States may decide to lower the threshold for the requirement of BACS indicated in Article 14(4). Those buildings under the new requirement and with BACS installed must also be exempt from inspections.

Member States may decide to extend the exemption on inspections for those individual building owners with systems under 290 kW that have BACS installed in compliance with Article 14(4). Member States that extend the exemption should notify it in their transposition.

Those Member States that choose to introduce requirements for residential buildings (as indicated in 3.1.6) must also introduce exemptions to inspections.

3.2. Ensure transposition of Article 14(3) – Alternative measures

The transposition of Article 14 for those Member States that decide to apply alternative measures is, to a large extent, only affected by the changes in scope, thresholds and exemptions (see point 2.9.) Member States may continue to apply the same range of measures.

Member States should re-calculate the target for *energy* savings that must be achieved at national level and then ensure that the range of measures put in place reaches this level. The new target and any changes in the alternative measures should be reported accordingly.

[Reporting obligations - To be completed]

3.3. Other changes

3.3.1. Step 3 – Establish training needs.

Due to the expanded scope of the revised EPBD Member States evaluate if new training is necessary and whether additional training is needed. This is particularly the case for those areas of the training that would relate to typical or average operating conditions.

MS could also establish whether this training would require re-accreditation. A calendar for the provision of training should also be prepared.

3.3.2. Step 4 – Changes in the reporting methodology

Member States must evaluate whether the reporting methodology, report templates, databases, etc. need to be updated.

3.3.3. Step 5 – Changes in the database

Member States should evaluate the need for updating-upgrading the database of reports and reporting mechanisms.

For those systems that are exempt due to Article 14(2) or Article 14(6), the databases should be able to record the period of validity of these exemptions.

3.3.4. Step 6 – Changes to the quality assurance mechanisms

Member States should evaluate the need for updating-upgrading the quality assurance process. The content of reports is likely to increase, which may therefore require further resources.

3.4. Best practices for implementation of provisions

To be completed.

4. ARTICLE 15 – AIR-CONDITIONING SYSTEMS

4.1. Understanding of Article 15

The provisions in Article 15 of the revised EPBD are almost identical to those in Article 14. The only difference being that Article 14 applies to heating systems while Article 15 applies to air-conditioning systems. By analogy, Member States may apply the guidelines provided on Article 14 – inspection of heating systems to the inspection of air-conditioning systems (or their alternative measures if applicable). References to heating system would apply to air-conditioning system, while heat generator or boiler would apply to cooling generator or chiller.

Sections 2.3 and 2.4 of these Guidelines cover those areas of overlap between heating and air conditioning systems, indicating how such cases should be treated.

4.2. Transposition of Article 15

As with Article 14, the requirements of Article 15 must also be incorporated into national law. The obligations in Article 14 are the same as those for Article 15. The indications provided in the present note for Article 14 may also be applied by analogy in the context of Article 15. For information on how to transpose Article 15, Member States are therefore invited to consult the sections indicated below:

- Systems to be inspected (see section 3.2.1)
- Effective rated output (see section 3.2.2)
- Performance under typical operating conditions (see section 3.2.3)
- Exemptions based on energy contracts or agreements (see section 3.2.4)
- Requirements on BACS (see section 3.2.5)
- Voluntary requirements for residential buildings (see section 3.2.6)
- Exemptions based on BACS or continuous electronic monitoring and effective control functionalities (see section 3.2.7)
- Ensure transposition of Article 14(3) – Alternative measures (see section 3.3.)
- Other changes (see section 3.4)