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ANNEX 1

ANNEX

to the

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Approval of the content of the draft Commission Notice providing guidance on new or substantially modified provisions of the recast Energy Performance of Buildings Directive (EU) 2024/1275

Minimum energy performance standards for non-residential buildings and trajectories for progressive renovation of residential buildings (Article 9)

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to the

Commission Notice providing guidance on new or substantially modified provisions of the recast Energy Performance of Buildings Directive (EU) 2024/1275

Minimum energy performance standards for non-residential buildings and trajectories for progressive renovation of residential buildings (Article 9)

1. INTRODUCTION

Article 9 of the recast Energy Performance of Buildings Directive ('the recast EPBD')¹ introduces new requirements for Member States to improve the energy performance of their existing building stock. This text provides guidance to Member States on how to incorporate the requirements to establish minimum energy performance standards for non-residential buildings and to set-up a trajectory for the progressive renovation of the residential building stock into national law (Article 9).

This Annex does not alter the legal effects of the EPBD and has no bearing on the binding interpretation of the EPBD as provided by the Court of Justice.

2. MINIMUM ENERGY PERFORMANCE STANDARDS FOR NON-RESIDENTIAL BUILDINGS

2.1. Scope of the requirements

Minimum energy performance standards (MEPS) are a regulatory tool to stimulate the renovation of existing buildings on a large scale. They remove the main barriers to renovation such as split incentives and co-ownership structures, which cannot be overcome by economic incentives, as also indicated in Recital 25. The recital further states that the general purpose of MEPS is to gradually phase out the worst-performing buildings and thereby improve the energy performance of the building stock.

For non-residential buildings, Article 9(1) requires Member States to set up a national MEPS scheme based on the establishment of minimum energy performance standards for non-residential buildings. These ensure that the buildings do not exceed the specified maximum energy performance threshold. The scheme is designed to improve the energy performance of the worst-performing non-residential buildings by certain enforcement dates.

2.2. Relevant definitions

2.2.1. Definition of non-residential buildings within the scope of Article 9

There is no explicit definition of a non-residential building. A non-residential building is a building that is used for a purpose other than residential, e.g. office buildings, healthcare buildings, wholesale and retail trade buildings, educational buildings, sports facilities,

¹ [Directive \(EU\) 2024/1275](#).

hotels and restaurants. This is a non-exhaustive list of non-residential buildings according to their use, in accordance with Annex I, paragraph 6.

With regard to mixed-use buildings, i.e. buildings that include both residential and non-residential units (e.g. a residential building with shops on the ground floor), Member States may identify the most appropriate approach and, according to Recital 34, may continue to choose whether to treat them as residential or non-residential buildings, or a mix of the two.

If a mixed-use building is being renovated, double-counting of energy performance improvements must be avoided. The improvements must therefore be clearly attributed to the residential or non-residential part of the stock.

All non-residential buildings fall within the scope of Article 9(1) irrespective of whether or not the owner or user is a public or private body. Energy renovations of public buildings with a non-residential use could therefore contribute to both the achievement of the MEPS thresholds and to the annual renovation target established under Article 6 of the Energy Efficiency Directive (Directive (EU) 2023/1791)², provided that such renovations meet the requirements set in both pieces of legislation.

2.2.2. Definition of worst-performing non-residential buildings

Article 9(1) states that worst-performing non-residential buildings are defined based on the national thresholds corresponding to the energy performance level of the worst 16% and worst 26% of the non-residential building stock in 2020 in terms of floor area or number of buildings. Member States shall establish additional thresholds for 2040 and 2050 with lower maximum energy performance thresholds to ensure the gradual phasing out of worst-performing buildings over time. Thresholds can be established for the entire non-residential building stock or by building type or category, based for instance on the building categories listed in Annex I. Categories of buildings could also be established according to their more specific use but also their size, typology, climate zone and a combination of these or other features.

2.3. Stepwise approach to designing minimum energy performance standards for non-residential buildings

The design of a MEPS scheme, including the selection of an indicator, the definition of thresholds and means of compliance, needs to be conducted in several steps. To make sure all design elements are considered and a proper enabling framework is set up, the following five steps are proposed to design and implement national MEPS schemes for non-residential buildings:

- identify data sources and characterise the non-residential building stock;
- define indicator(s), an energy performance baseline and set energy performance thresholds;

² For more details on the obligations for public buildings under the Energy Efficiency Directive, consult [*Guidelines on energy consumption in the public sector, renovation of public buildings and public procurement* \(Articles 5, 6 and 7\)](#).

- design governance and rules of compliance;
- set up an enabling framework;
- set up a monitoring mechanism and penalty scheme.

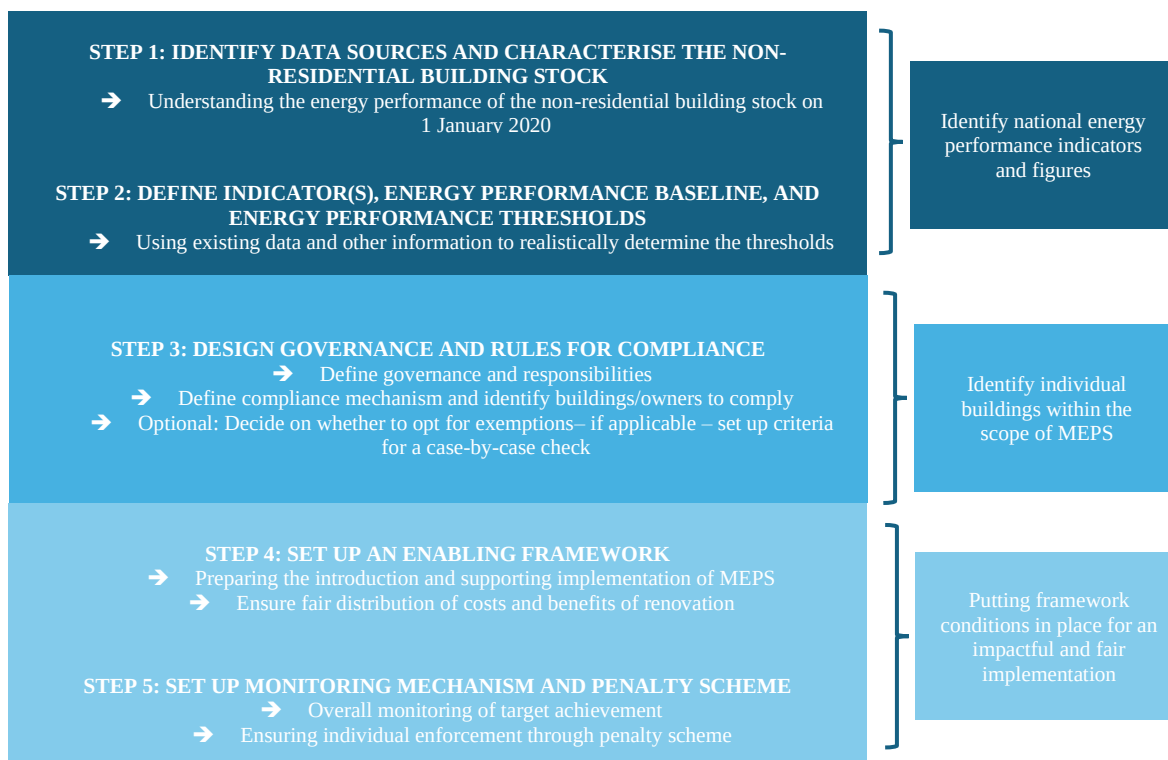


Figure 1. Recommended steps for the design of a MEPS scheme for non-residential buildings

In the sections below, examples and possible options for the different MEPS design features in accordance with Article 9 are presented based on the five steps in Figure 1. The elements for each of the steps can be recombined to match individual Member States' circumstances such as specificities of the existing building stock, prevalence of certain barriers and capacities to address them.

2.3.1. STEP 1: Identify data sources and characterise the non-residential building stock

To establish a baseline for non-residential buildings, Member States need to have a clear understanding of the energy performance of their non-residential building stock on 1 January 2020. Member States therefore have to characterise their building stock, i.e. collect and process the relevant information to describe the building stock according to its main characteristics in order to derive its energy performance. This characterisation of non-residential building stock should allow Member States to rank all non-residential buildings by energy use in order to then determine the maximum energy performance thresholds, including 16% of the non-residential building stock for 2030, 26% for 2033, and the subsequent thresholds for 2040 and 2050. The worst-performing buildings with an energy use above the maximum thresholds identified for each year will then be obliged to comply with MEPS.

There are at least two general approaches to the characterisation of non-residential stock that can be implemented individually or in combination using a) existing building stock

data and complementary data sources; and/or b) statistical sampling and ad hoc data collections. These are described in the following sub-sections.

For any approach selected by Member States, it is recommended to establish a clear plan in terms of time and resources.

The characterisation of non-residential building stock also relates to the development of the database described in Article 22. In the case of public buildings, Member States may take advantage of the data collected for the purpose of the public buildings inventory required by Article 6(5) of the Energy Efficiency Directive, which could be used for the characterisation of the stock of non-residential public buildings. During the initial characterisation of non-residential building stock, different existing databases will have to be identified and used. Some of these databases, such as energy performance certificate (EPC) databases, 3D urban models and cadastre or land registers, could potentially turn into permanent data sources to populate the national database for the energy performance of buildings as defined in Article 22.

Before characterising the non-residential building stock, it is recommended to select the indicator for the implementation of the MEPS scheme. Article 9(1) states that Member States can choose to establish the national thresholds in either final energy use or primary energy use. The choice of the preferred indicator has implications for the type and range of measures that can be implemented to improve the energy performance and therefore to comply with the MEPS obligation (see section 2.3.2.1). It is therefore recommended to characterise the non-residential building stock using the indicator that will be used for the MEPS scheme.

When already in place, the update and improvement of existing databases such as EPC repositories or cadastre registers may enable a faster and more cost-effective characterisation of the non-residential building stock in comparison to implementing an approach involving data collection from scratch. When selecting data sources for the characterisation of the non-residential building stock, Member States shall consider key data aspects such as ownership, rights of accessibility, privacy and security to ensure that the rights of building owners, tenants and any other relevant stakeholders are protected. These aspects are also relevant for other steps of the design of the MEPS scheme as discussed in other sections.

2.3.1.1. Use of existing building stock data and complementary data sources

2.3.1.1.1. Data sources

Member States may use a wide range of existing data sources to characterise non-residential building stock. Where available, information related to the energy performance of a subset or segments of the non-residential building stock can be obtained from sources such as EPCs, results from research, censuses, energy audits or aggregated measured energy data. It is possible to estimate the energy performance of a building by comparing it to buildings with similar characteristics – such as use, date of construction, typology and location – for which energy performance data is available.

Data on the physical characteristics and other features of the non-residential building stock such as use, date of construction, typology, location, geometric characteristics or data on technical building systems can be collected from sources such as 3D urban models, satellite images, digital building logbooks, cadastre data, construction and planning permission registers, interviews with architects or developers, and others.

It is recommended that Member States assess the quality, completeness and representativeness of the different datasets. It is also recommended to further pursue the automatic updating of these datasets and the interoperability between the databases.

2.3.1.1.2. Preliminary characterisation and building categories

For the characterisation of non-residential building stock, it is recommended to start with a preliminary estimate of the overall size of the building stock and the share of buildings in each use category, such as offices, healthcare, wholesale and retail trade, educational buildings, sports facilities, hotels and restaurants, as mentioned in Annex I of the EPBD. Member States are encouraged to use established use categories from existing policies, which may be more detailed. This will enable the identification of those segments where data collection may require higher efforts.

The non-residential building stock varies not only in terms of use but also in term of size, typology, facade materials and technical building systems. To obtain a better characterisation of the stock, it is therefore recommended to split it into more manageable portions based not only on their use, but also on some of these additional features. Results from research such as EPISCOPE³ and TABULA or existing national categorisations can support this process. Also, patterns of common local or regional construction practices can be used as a criterion to define categories. Examples of other criteria include date of construction, climate zone, and heating system technology. This enables a breakdown of non-residential stock into segments of buildings with more similar characteristics (e.g. large hospitals (with floor area > x m²), located in a certain climate zone). It can make it easier to develop assumptions for each segment when required and improve the results when estimating the energy performance of the buildings for which data is not available. Also, such categories may be used to develop different thresholds per building category that Member States may define.

The classification of buildings according to the construction period, location or climate zone can be linked to common construction practices. For instance, the implementation of previous building codes or energy performance standards, including requirements on the thermal characteristics of materials, can enable assumptions about the materials, thermal characteristics and systems of non-residential buildings. A building energy code implemented in the 1980s, including minimum requirements for the U-value of windows or a minimum level of insulation, can then be used to assume certain values for the material and other characteristics of buildings constructed during that period for which individual information is not available. Member States can also build on the classifications used for other purposes, for instance on the buildings' typologies used for the purpose of the cost-optimal calculation.

Interviews with architects, constructors and developers can help refine the assumptions about construction practices over the years. They may also help identify building typologies, their physical characteristics and distribution over time (e.g. typical school construction between 1960 and 1970).

³ <https://episcopes.eu/welcome/>.

In the case of different climate zones, the local climate conditions may impose certain requirements on construction practices, e.g. a higher level of insulation is expected in regions with cold climates compared to warmer regions. These kinds of analysis can also strengthen the assumptions for buildings without individual data.

2.3.1.1.3. Using EPC data

It is important to ensure that the available EPCs are sufficiently representative of non-residential building stock. A representative dataset reflects the characteristics of the whole non-residential building stock, mirroring for instance the relative share of different building categories according to age, size, climate region etc. The coverage of EPCs of e.g. public buildings could be overrepresented due to the existing obligation to include the EPC information of public buildings in existing energy performance databases according to Article 10(6a) of Directive 2010/31/EU. Regions with a high density of non-residential buildings (e.g. capital cities or cities with large service sectors) may be overrepresented as well. It is important to assess whether these cases are in specific climate regions that do not represent the circumstances of the rest of the non-residential building stock. Similarly, other characteristics such as size and typologies should be assessed. The gaps identified in the EPC data available can be addressed by collecting additional information from the categories of buildings, regions or climatic zones that are underrepresented.

Besides coverage per use, size, typology, climate zone and other characteristics, the time of issuing is also relevant when using EPC data. EPCs are valid for 10 years and an EPC may not have been reissued after the building underwent renovation. Furthermore, the requirements to issue EPCs also introduce a bias in the database. EPCs are generally issued for new buildings or for buildings that are in the sales or rental market. These buildings may have a different performance compared to buildings that have been out of the market for a long time. Last but not least, many subsidy schemes require an EPC to demonstrate the improvement of the buildings' performance. This may include EPCs for both before and after, just before or just after.

To refine the data on the current status of the building, EPC data can be combined with additional information from construction and planning permission registers and digital building logbooks (when available). These can provide information on the date and scope of previous renovation activities carried out on the buildings.

2.3.1.1.4. Estimating the energy performance of non-residential buildings

Once there is assurance that EPC data or other data on the energy performance for a subset of buildings is representative of the whole (or parts) of the non-residential building stock and available, Member States may choose to combine this information with information on the physical characteristics and other features of the same buildings to create a reference set. A combination of data such as use, date of construction, location and size of the buildings for which the energy performance information is not available can be fed into statistical models such as multinomial logistic regression (based on the buildings in the reference set) to estimate their energy performance. This allows an energy performance value to be assigned to each building for which this data is not available and therefore complete the characterisation of the non-residential building stock.

When the energy performance information from subsets or segments of the non-residential sector is not representative or is not available, information for each individual building on its use, date of construction, typology, location, geometric characteristics or technical building systems can be fed into energy models to simulate the operation of the buildings

and estimate their energy performance. Similar to the case described above, this allows an energy performance value to be assigned to the buildings for which this data is not available and therefore completes the characterisation of the non-residential building stock.

Coupling bottom-up data (buildings' physical characteristics, location, energy performance etc.) with top-down data (aggregated data for different energy carriers' consumption, final energy consumption, national statistics on building construction practices etc.) can strengthen the characterisation of non-residential building stock. The estimations based on bottom-up data can be cross-checked with the available top-down data to calibrate the assumptions and estimations made.

It is recommended that Member States describe the data sources and approach they use for the characterisation of non-residential building stock in their national building renovation plans (NBRPs).

2.3.1.2. Statistical sampling and ad hoc data collection

For the cases where there is no representative data on the energy performance of non-residential building stock or no data at all, statistical sampling and ad hoc data collection can support the characterisation of the building segments. The collection of data can be used to complement existing data and cover specific gaps, e.g. related to building types, geographical areas or climatic zones. This approach can be used on its own or alongside existing data to verify the findings and assess their plausibility.

When using statistical sampling, it is recommended to have a preliminary overview of non-residential building stock, breaking it down into different categories of buildings with similar characteristics in terms of use, typology, location, date of construction and/or others. The different categories of buildings should be represented in the final statistical sample.

A clear sampling procedure is required, e.g. by conducting a multi-stage survey that combines methods such as a screening for general information available from the sample buildings, followed by interviews with building owners and then on-site inspections⁴. The information to be collected includes details on the operation of the building, energy demand, energy suppliers, construction materials, details on previous renovations and any other relevant data.

The information collected can be put into a simulation model to estimate the energy performance of the sample buildings. The results can be extended to the rest of the building stock, taking the initial categorisation into consideration. The results can then be cross-checked with available aggregated data on the energy performance of the building stock as in the previous approach.

⁴ As proposed [here](#) based on a complete survey conducted in Germany.

Table 1. Characterisation approaches to non-residential building stock

Approach	Key requirements and steps	Advantages/challenges
Building stock data and complementary data sources	▪ Sufficiently representative data across dimensions such as use categories, geographical and climatic coverage, years of construction, size, typologies, others. ▪ Assess the quality of datasets and identify gaps. ▪ Integrate the different datasets/sources available and fill the gaps. ▪ Characterise the buildings for which the energy performance data is available in terms of use, typology, etc. Characterise in the same way the buildings without energy performance data. ▪ Define the model to estimate the energy performance of buildings for which this data is not available based on their characteristics and the reference set of buildings.	Advantages ▪ Leverage existing data resources. ▪ If based on EPCs, it makes it easier to use EPCs as a compliance mechanism. ▪ Useful to identify gaps to be covered by dedicated data collection. Challenges ▪ Data across different databases is usually not consistent. ▪ If data triangulation is not possible, a simplified estimation of energy performance can lead to miscalculations. ▪ Ownership and accessibility to the data from different sources may be a barrier.
Statistical sampling and ad hoc data collection	▪ Establish the characteristics of a sample of buildings representative of national non-residential building stock. ▪ Conduct a survey to collect data from a representative sample of non-residential building stock. ▪ Use a building model to estimate the energy performance of non-residential building stock.	Advantages ▪ Up to date and specific to the policy requirements for setting up and monitoring a MEPS scheme. ▪ The data could be used for other policy purposes. Challenges ▪ Sampling period can be long. ▪ Costs and responsiveness rate. ▪ Reliability of the building model.

2.3.2. *STEP 2: Define indicator(s), energy performance baseline, and set energy performance thresholds.*

The provisions in Article 9 allow Member States to make different decisions on certain features of the MEPS scheme for non-residential buildings, such as the choice of the indicator to deploy the MEPS scheme (final or primary energy use), whether to exclude certain building categories from the baseline, and whether to define a threshold for the entire non-residential building stock or by category (see Figure 2). This section presents

different considerations that Member States should take into account while defining these features for their MEPS scheme.

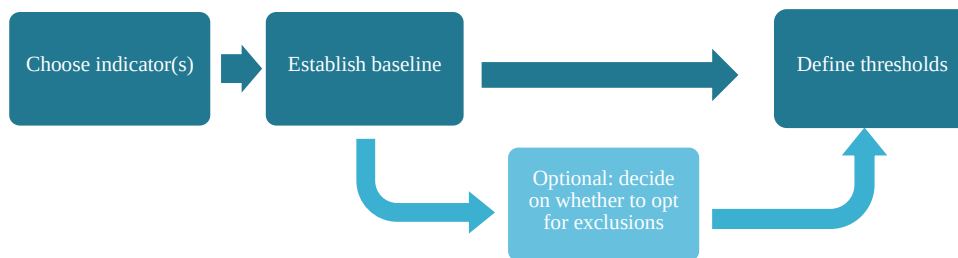


Figure 2. Definition of key features of the MEPS scheme for non-residential buildings

2.3.2.1. Indicator for the implementation of MEPS

Article 9(1) states that Member States can choose the indicator for the maximum energy performance thresholds to be either final energy use or primary energy use. The choice of the preferred indicator has implications for the type and range of measures to comply with the MEPS obligation (see Table 2).

Final energy use is the amount of energy that must be delivered to the building for space heating, space cooling, domestic hot water, ventilation, built-in lighting and other technical building systems to ensure the standardised operation of the building throughout the year. It describes the theoretical energy demand based on the physical properties of the building envelope and the systems technology. Primary energy use is energy from renewable and non-renewable sources that has not undergone any conversion or transformation process (see Article 2(9)). The use of **final energy use** as the main indicator encourages measures aimed at improving the efficient use of energy in buildings, such as the renovation of building envelopes and installation of more efficient heating systems, thereby tackling decarbonisation by reducing energy demand. However, it has limitations when it comes to comparing energy sources, introducing renewable energy sources in buildings or accounting for the improvements in the energy grid. The use of **primary energy use** would cover both energy efficiency measures described above and the use of renewable energy sources in buildings, thereby promoting also the decarbonisation of the building energy supply. It also makes it easier to compare multiple energy carriers.

If adjustments to primary energy factors or weighing factors per energy carrier lead to a better outcome of calculated energy performance, Member States need to justify the adjustments to the Commission and show that they reflect a real change in the mix of energy sources. The choices made and data sources shall be reported in accordance with EN 17423 or any superseding document (see Annex I.2).

The Commission recommends the use of primary energy given its use as the main indicator in the methodology for calculating energy performance (Annex I) and EPCs.

In accordance with Article 9(3), Member States can use complementary indicators of non-renewable and renewable primary energy use, and of operational greenhouse gas emissions expressed in kgCO₂eq/(m².y). These indicators should be treated as additional ones, i.e. they can be used to establish a second requirement for non-residential buildings that are above the thresholds identified through the main indicator (final or primary energy use). This second requirement could help achieve higher levels of renewable energy use in buildings or further reductions in greenhouse gas emissions. The additional indicators

cannot therefore substitute final or primary energy use as the main indicator for the setting of the energy performance threshold of the MEPS scheme.

A reference-building approach resulting in a ratio and displayed as a threshold expressed in final or primary energy use in kWh/(m²y) will also be eligible to establish the baseline and thresholds in accordance with Article 9(1).

Table 2. Threshold indicator options

	Advantages	Disadvantages
Final energy use	Encourages measures to reduce the energy needs, including renovation of the building envelope, efficient heating systems, low-cost measures to reduce heat losses in heat distribution systems within the building. It may be easier to communicate as it relates directly to energy bills and is therefore directly related to consumers' decision-making.	The measures related to the decarbonisation of the building energy supply and the use of renewables on-site are not reflected by the indicator. Comparison between energy carriers is more complex.
Primary energy use	Encourages a larger set of measures, including both those that reduce energy needs and those related to the decarbonisation of the building energy supply and the use of renewables on-site. It allows for a direct comparison between different energy carriers. It is based on the same indicator used to identify energy classes in the EPCs. This could facilitate monitoring and compliance checks. Well-established indicator in the EPBD to express the energy performance of buildings across several provisions (e.g. Zero Emission Buildings,	Primary energy use can change due to changes in the energy mix and primary factors, making monitoring difficult. Reduction of primary energy through measures in the supply side needs to be accounted for. More complex to communicate for non-specialists.

	minimum energy performance requirements).	
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2.3.2.2. Baseline for the MEPS scheme

Article 9(1) states that the energy performance of non-residential buildings must be improved to ensure that their energy use is below the maximum energy performance thresholds, including 16% of non-residential building stock for 2030, 26% for 2033, and the subsequent thresholds for 2040 and 2050. To determine these thresholds, Member States must set up a baseline reflecting their non-residential building stock on 1 January 2020. Member States may use data of a more recent year than 2020 along with the relevant assumptions (such as new construction rates and records of renovations or demolitions) to interpolate and achieve a realistic characterisation of the building stock in 2020. Member States should report data from 2020 in their NBRP as well as more recent data (2023 data for the submission of the first plan in 2025). This is reflected in the NBRP template.

The characterisation of non-residential building stock as described in STEP 1: Identify data sources and characterise the non-residential building stock is the main input to establish the baseline and define the energy performance thresholds.

The Directive allows Member States to exempt certain categories of buildings from MEPS according to Article 9(6) and exempt individual buildings according to Article 9(1). Both provisions are optional and have different effects on the application of MEPS.

The exemptions based on certain building categories as described in Article 9(6) lead to the exclusion of the selected buildings from the baseline. The considerations for them are explained in the following subsection.

Conversely, the individual buildings that may be exempted according to Article 9(1) cannot be removed from the baseline. They are discussed in Section 2.3.3.4.

2.3.2.2.1. Exemptions according to Article 9(6)

Member States may decide to exempt certain categories of buildings listed in Article 9(6) from the requirements under Article 9(1) as listed below:

- (a) Officially protected buildings, e.g. due to their special architectural or historical merit, or other heritage buildings. This applies only if compliance with the standard would lead to an unacceptable alteration to the character or appearance of the building, or if the renovation is not feasible from a technical or economic point of view.
 - There is technical feasibility when the technical characteristics of the technical building systems and the building (or building unit) make it possible to apply renovation measures to comply with the MEPS requirement. There is no technical feasibility when it is impossible to apply renovation measures to improve the energy performance of the building below the MEPS threshold due to technical limitations such as structural elements of the building, materials, aesthetics, space constraints, and others.
 - Economic feasibility relates to the costs of applying the MEPS requirements and whether: (i) these costs are proportionate to the overall goal of the planned intervention (e.g. technical building system upgrade); (ii) the

expected benefits outweigh the costs, taking into account the expected lifetime of the system or of the building, where appropriate.

- (b) Buildings used as places of worship and for religious activities.
- (c) Temporary use (two years or less), industrial sites, workshops and non-residential agricultural buildings with low energy demand and non-residential agricultural buildings that are used by a sector covered by a national sectoral agreement on energy performance.
- (d) Residential buildings that are used or intended to be used for either less than four months of the year or, alternatively, for a limited annual time of use and with an expected energy consumption of less than 25% of what would be the result of all-year use.
- (e) Stand-alone buildings with a total useful floor area of less than 50 m².
- (f) Buildings owned by the armed forces or central government and serving national defence purposes, apart from single living quarters or office buildings for the armed forces and other staff employed by national defence authorities.

If Member States decide not to include the buildings associated with some or several of these categories in their national MEPS scheme, these buildings must be removed from the baseline, i.e. they will not be counted as part of the non-residential building stock when defining the thresholds. The exclusion is therefore not automatic, the relevant national authorities must decide whether to apply exemptions and report such decisions in their national NBRPs. Member States shall also provide an estimation of the share of buildings excluded from the baseline in their NBRPs (see Annex II to the recast EPBD). The exclusion (for instance of historical buildings with non-residential use) has the disadvantage that it prevents such buildings and their owners from benefiting from access to tailored financial aid and specialised guidance that shall be provided on the basis of the recast EPBD Article 9(4), paragraphs a, b, d.

If Member States decide to exempt one or more of the categories indicated above, they must develop clear and public/transparent criteria to determine which buildings will be exempted. This is important when communicating the scheme to building owners. For example, if a Member State decides to exempt historical or heritage buildings, the MEPS scheme must include a clear definition of what is considered a historical building and what types of historical buildings are exempted (e.g. by making reference to a historical building catalogue).

2.3.2.2.2. Differentiation by building category

The baseline and the thresholds for the MEPS scheme can be established for the entire non-residential building stock or by building type or category. Categories of buildings can be defined according to their use (examples in Annex I to the recast EPBD: offices, educational buildings, hospitals, hotels and restaurants, sport facilities, wholesale and retail

trade services buildings, or others⁵), but also their size, typology, climate zone and a combination of these or other features.

Predefined categories in existing data sources such as cadastre registers or censuses can support the categorisation process. If defined by category, the thresholds should be defined separately for each category.

The implementation of a single threshold for the entire non-residential building stock may simplify the characterisation and monitoring process. However, the classification of buildings by category is recommended to avoid treating certain building segments unfairly.

For instance, if the baseline is defined in terms of the entire non-residential building stock, the same threshold will apply to hospitals, office buildings and hotels. These types of buildings in practice have different energy use patterns and potential for energy use reduction. If a single threshold is defined for the entire non-residential stock, this would disadvantage buildings with inherently higher energy use per square metre due to their specific functions. For instance, hospitals use more energy due to increased ventilation requirements. This will put them in an unfavourable position to comply with the same threshold compared to office buildings, which typically consume less energy under similar conditions and will therefore meet the same threshold much more easily.

Another example can be related to buildings in different climate zones. There can be significant differences in the energy performance of buildings from the same use category (e.g. hotels) and with similar dimensions due to the climate zone where they are located. The characteristics of different climate zones (temperature, humidity, solar radiation etc.) may call for different construction practices in terms of materials, technical building systems etc. For instance, a hotel in a warm coastal climate may require sun shading systems and extensive cooling. In contrast, a similarly sized hotel in a cold, non-coastal city may not need shading systems but have high heating requirements.

It is therefore recommended to establish different categories to capture the particularities of different building segments according to the context of each Member State, considering different use, size, typology, climate zones etc. The classification will depend on aspects such as current categorisations that may exist in building databases such as cadastre registers, if there are pre-established climate regions identified within the country, whether there are clear time periods linked to previous building energy codes with specific requirements for materials and building systems, etc.

Applying the same threshold to all non-residential buildings without considering their specificities could result in suboptimal renovations that are not cost-efficient. Defining baselines by category also makes it easier to design better targeted renovation support and strategies to implement MEPS, taking into account differences in ownerships/renting practices, estimated renovation times, common features and typologies, etc. This can also trigger innovation developments for instance in devices and building systems specialised for each category (e.g. hospital and building offices).

⁵ Note that these are all categories describing service sector buildings – the non-residential building stock may have other categories with a lower number of buildings, including transport, industry and agriculture buildings.

2.3.2.2.3. Final baseline

Based on the characterisation of the non-residential building stock conducted in STEP 1: Identify data sources and characterise the non-residential building stock, the data collected and estimated for the energy performance of non-residential buildings is used to rank the buildings according to the indicator selected, final energy use or primary energy use.

If Member States opt to exempt certain building categories indicated in Article 9(6), their data shall be removed from the characterisation and therefore be excluded from the baseline so they do not appear anymore in the ranking.

Based on the data collected and estimated during the characterisation of the building stock, the buildings can be ranked by creating a frequency distribution of the buildings or by using the data for each individual building. To create a frequency distribution, the data range (the difference between the minimum and maximum value of the energy use, e.g. 0-500 kWh/(m²y)) is divided into the number of desired classes. The range for each class is defined accordingly, e.g. class 1 corresponds to 0-19 kWh/m²/year, class 2 corresponds to 20-39 kWh/m²/year, class 3 corresponds to 40-59 kWh/m²/year and so on. The data points in each class are counted to define the frequency. This can be done by the number of buildings or by floor area.

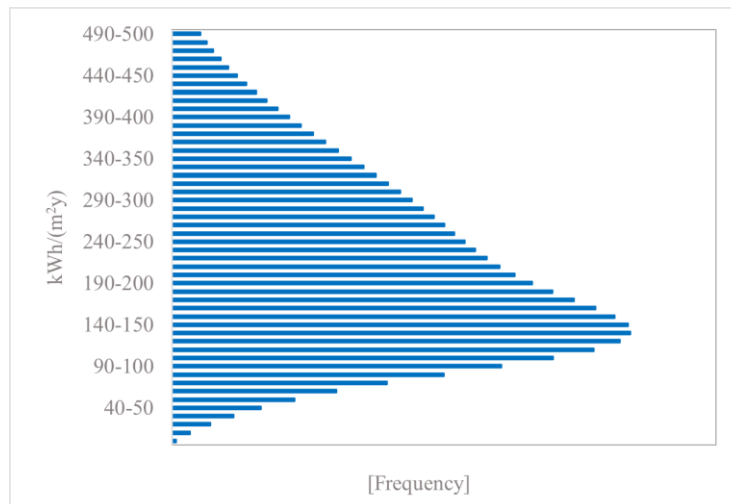


Figure 3 shows an example of frequency distribution. Each bar represents the number of buildings or the floor area of the buildings in each class. The buildings that belong to the classes at the top of the graph perform worse than the buildings in the classes at the bottom.

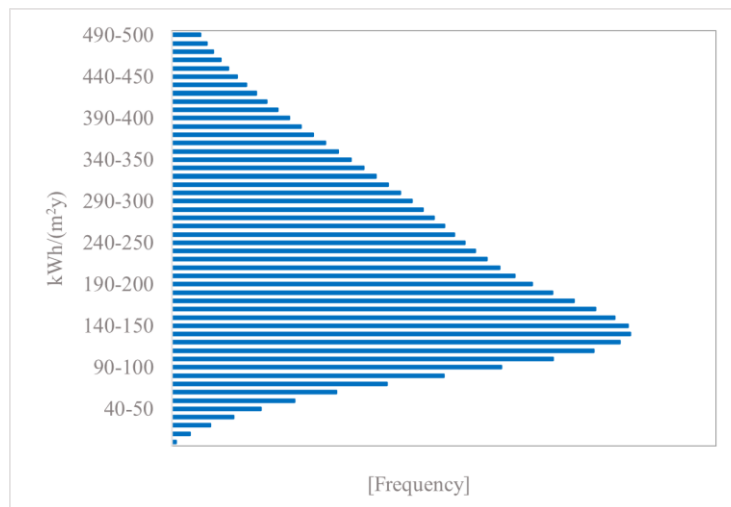
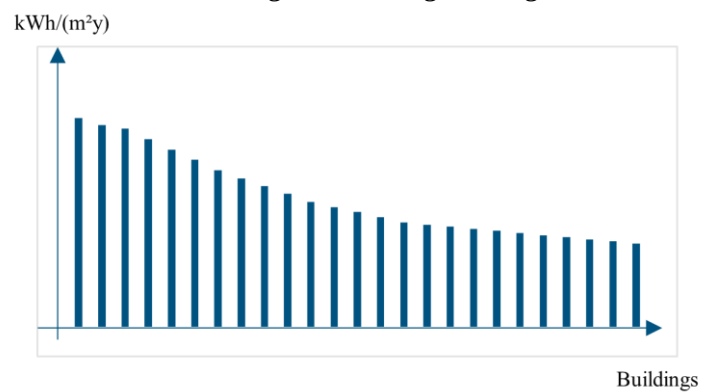


Figure 3. Non-residential building stock organised according to the energy use in a frequency distribution

To create the baseline using data for each individual building, the buildings are organised according



to their energy use as illustrated in

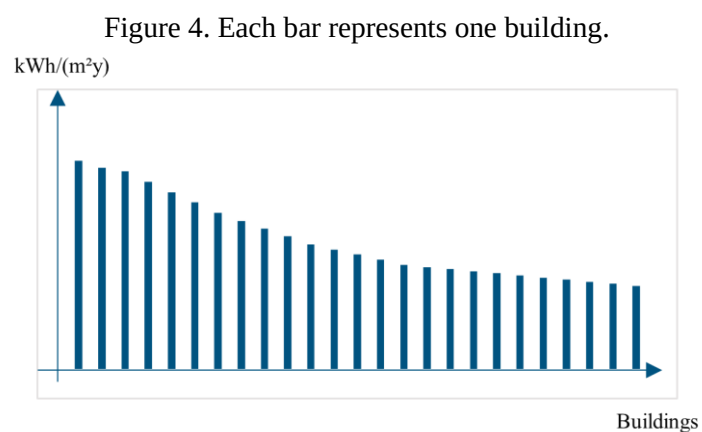


Figure 4. Each bar represents one building.

Figure 4 is intended to be a representation of an entirely fictional non-residential building stock. The building stock is assumed to be composed of 25 buildings, therefore only 25 bars are presented to facilitate visualisation. The same approach to create a frequency

distribution can be reproduced for a building stock of thousands of buildings. This approach and similar figures are used to illustrate other concepts and provisions in the following sections.

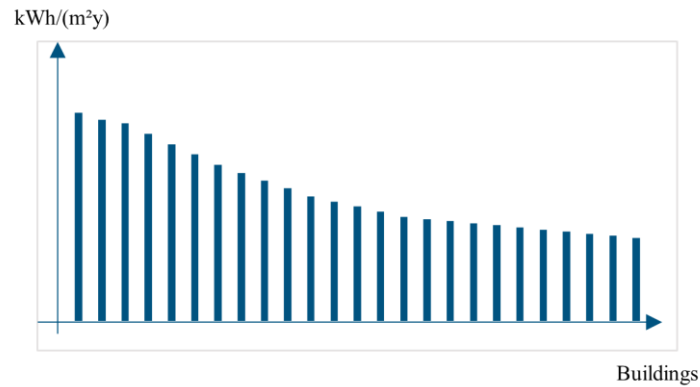


Figure 4. Illustration of the baseline for non-residential building stock

The baseline should include as a minimum the number of buildings (or floor area), type of buildings (i.e. office, healthcare, wholesale and retail trade, educational buildings, sports facilities, hotels and restaurants etc.), other building categories (if defined by the Member State) and their energy performance. The baseline should allow the subsets of worst-performing buildings to be identified (e.g. 16%, 26%) so that the maximum energy performance thresholds can be defined, as explained in the following subsection. Regardless of the number of categories or subcategories, the total portion of building stock that must undergo renovation remains the same (in number of buildings or area).

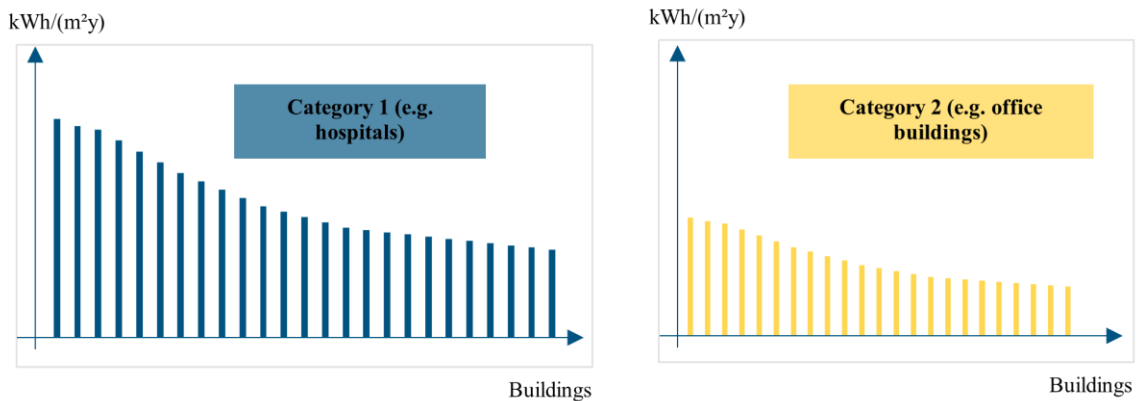


Figure 5. Illustration of baselines for different categories of non-residential building stock

If thresholds for several building categories are implemented, a specific baseline shall be established for each of the categories. The buildings in each category are organised

according to their energy use. Figure 5 illustrates the case for two categories, each bar represents one building⁶. Note that each category may have different number of buildings with a different range of energy performance.

2.3.2.3. Energy performance thresholds for MEPS

Under Article 9, non-residential buildings must comply with specific energy performance thresholds that shall not be exceeded by the specified deadlines. The energy performance thresholds must be set in a way that at least 16% and 26% of the national non-residential building stock exceed these thresholds. These thresholds are expressed in kWh/(m²y) and should represent either their final or primary energy use. Subsequent thresholds need to be established for 2040 and 2050, in line with the pathway for transforming the national building stock into a zero-emission building stock.

Member States shall ensure that all non-residential buildings are below the 16% threshold by 2030 and below the 26% threshold by 2033 unless they are exempted from the provision in accordance with Article 9(1) or Article 9(6).

To establish the thresholds, the number of buildings or the floor area can be used as explained below.

2.3.2.3.1. Defining the thresholds according to the number of buildings

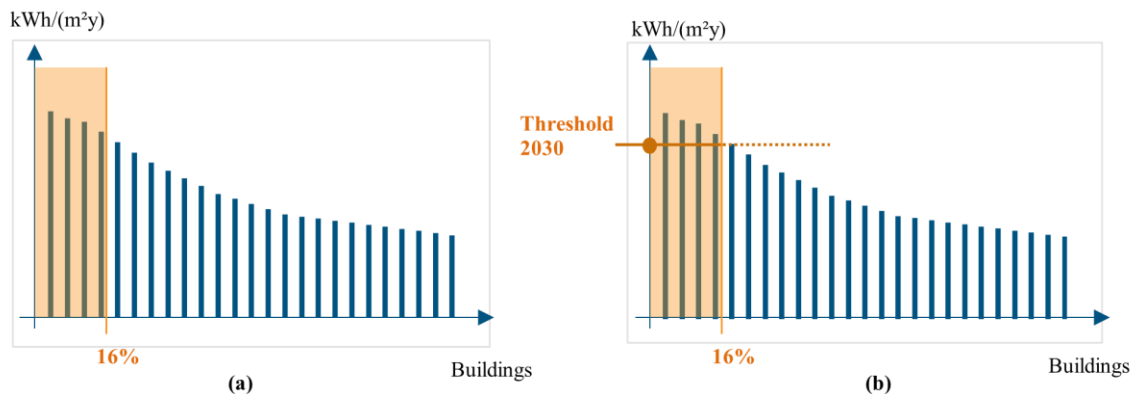


Figure 6. Establishing the 16% threshold: (a) identifying the 16% of buildings, (b) defining the threshold

If the thresholds are established based on the number of buildings, the number of buildings in the baseline are counted starting from the building with the worst energy performance until the percentage of buildings indicated for each milestone is reached. For instance, in

⁶ The graphs are a representation of fictional non-residential building stock. Category 1 has 25 buildings, and category 2 has 20 buildings.

2030, the threshold shall be established by covering 16% of the total number of buildings as illustrated in Figure 6(a). The energy use (in terms of final or primary energy use) of the next building after reaching 16% of the buildings shall correspond to the maximum energy performance threshold for 2030 as shown in Figure 6(b). In the example, by 2030 all buildings belonging to the 16% group must be renovated to improve their energy performance below the threshold in kWh/(m²y) represented by the horizontal orange line.

The 26% threshold for 2033 can be defined following the same approach, as shown in Figure 7. The subsequent thresholds for 2040 and 2050 can be defined following the same approach, see also Figure 9.

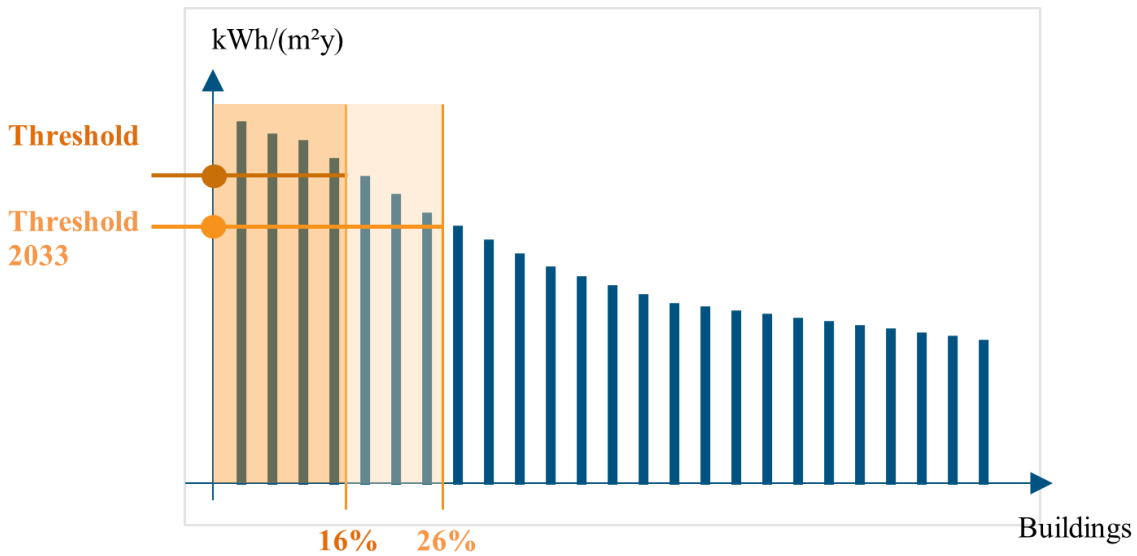


Figure 7. Illustration of 2030 and 2033 energy performance thresholds for MEPS

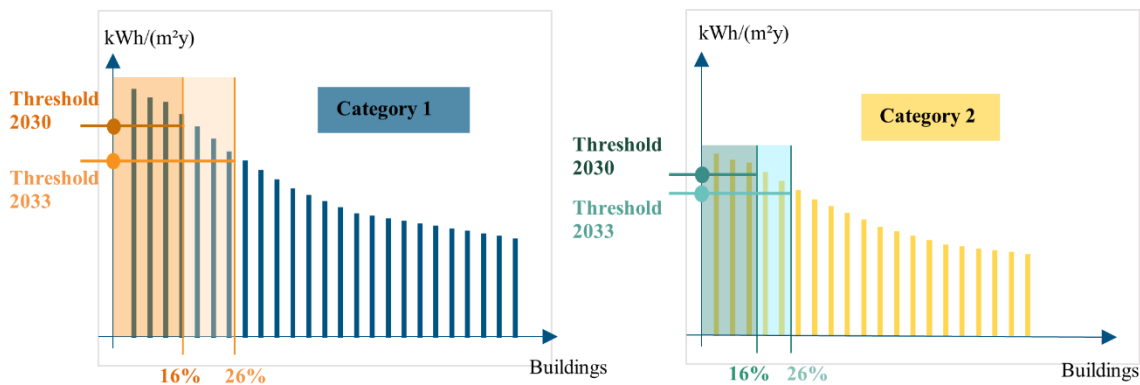


Figure 8. Illustration of 2030 and 2033 energy performance thresholds for MEPS when using multiple categories

If thresholds are defined for different building categories, the procedure previously described is applied to each of the baselines of the categories as illustrated in Figure 8. The 16% and 26% thresholds will represent a different number of buildings in each category,

and the thresholds will be different values in kWh/(m²y) according to the energy use of the buildings in the category.

2.3.2.3.2. Defining the threshold according to the floor area

If the threshold is established in terms of the building floor area, the approach is similar to the method based on the number of buildings. The floor area of the buildings in the baseline is counted starting from the worst performing building until the percentage of floor area indicated for each milestone is reached. In 2030, this value shall correspond to 16% of the total floor area of the buildings included in the baseline. The energy use of the next building after reaching 16% of the floor area shall correspond to the maximum energy performance threshold for 2030.

In this case, it is important to note that even though the threshold is established based on the floor area, the number of buildings above the threshold shall also be established.

The 26% threshold for 2033, and the subsequent thresholds for 2040 and 2050, can be defined following the same approach.

If thresholds are defined for different building categories, the procedure previously described is applied to each of the baselines of the categories.

2.3.2.3.3. Defining the threshold according to the energy performance class

Setting energy performance thresholds corresponding to the energy performance class is optional for Member States. It has the advantage that it improves the visibility of the MEPS scheme and makes communication and monitoring easier.

If the threshold is defined to correspond to a specific energy performance class in accordance with Article 19(2), the definition should still comply with Article 9(1), third subparagraph. The buildings above the threshold shall therefore at least cover the indicated portion of the worst-performing buildings, i.e. 16% for 2030, 26% for 2033, etc.

This can be done by defining the energy performance classes G and F of EPCs using the coverage indicated in Article 9(1), third subparagraph, i.e. 16% threshold for G and 26% threshold for F respectively. Alternatively, Member States could also define class G as the 26% threshold for the building stock. While this would give more space to upper classes, it would make the differentiation between the 16% and 26% thresholds less visible. The buildings should be renovated to improve their energy performance and achieve a better energy performance class than the one defined in the threshold. Similarly, additional classes (e.g. D and E) could be used to represent the thresholds for 2040 and 2050.

2.3.2.4. Energy performance thresholds beyond 2033

In addition to the first two thresholds, Member States shall establish additional thresholds for 2040 and 2050 with values representing progressively lower energy consumption levels. These thresholds shall be reported in their national renovation plans as referred to in Article 3(1), point (b).

The maximum energy performance thresholds for 2040 and 2050 shall be in line with the pathway for transforming the national building stock into a zero-emission building stock. The threshold for 2040 can be defined as a midpoint threshold between the 26% for 2033 and the threshold for 2050 (see Figure 9). The allocation of the threshold for 2040 closer to 26% (threshold for 2033) or closer to the final threshold for 2050 will define the number of

buildings or floor area to be renovated in 2033-2040 and in 2040-2050. A threshold for 2040 closer to the final threshold for 2050 will require most of the renovation efforts to occur in 2033-2040. However, a threshold for 2040 closer to 26% can encourage non-residential buildings covered by the MEPS obligation for the 2033 threshold to implement adequate renovation measures to already meet the upcoming 2040 threshold. This will avoid a double intervention in the building to comply with the 2033 threshold and then with the 2040 threshold. It is recommended to consider these economies of scale when defining the 2040 and 2050 thresholds.

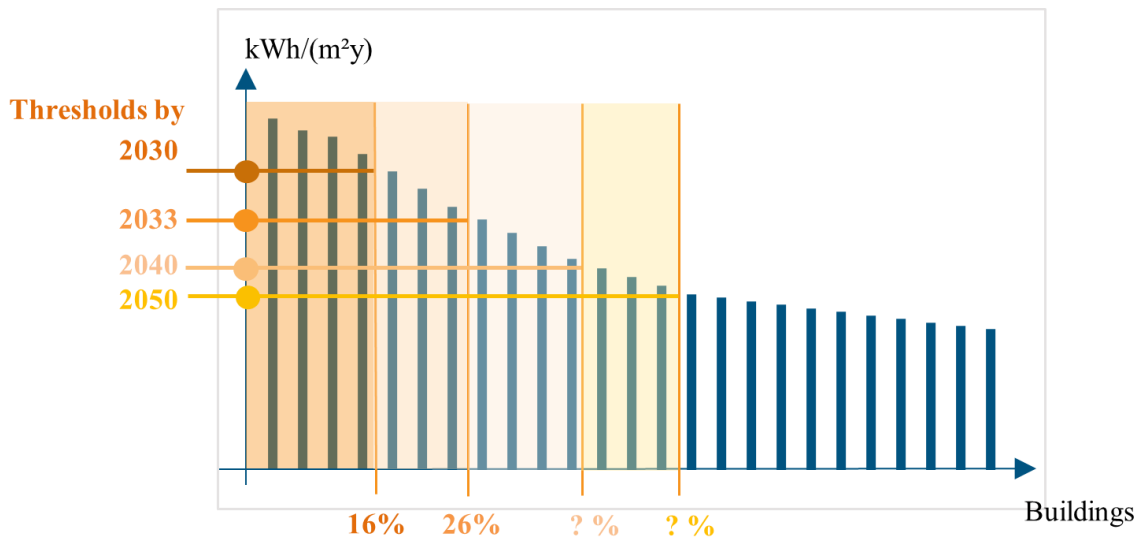


Figure 9. Illustration of 2040 and 2050 thresholds for minimum energy performance standards for non-residential building stock

It is recommended to make publicly available all the thresholds and timeline for all the relevant actors as soon as possible and in a clear way.

2.3.2.5. Temporary adjustment of the threshold in case of serious damage due to natural disaster

Article 9(1) last subparagraph states that in the case of serious damage to a portion of non-residential building stock by a natural disaster, a Member State may temporarily adjust the maximum energy performance threshold. This way, renovation activities can focus on the renovation of damaged buildings. The adjustment of the threshold should correspond to a proportionate share of worst-performing buildings, equivalent to the damaged buildings. By adjusting the threshold, those worst-performing buildings are temporarily not required to comply with the threshold. If this provision is used, Member States will have to report on the adjustments and estimated duration in their NBRP (Article 3).

Example: If shortly before the first threshold in 2030 (corresponding to 16% of the worst-performing buildings) 1% of the non-residential building stock is seriously damaged by a natural disaster and the Member State intends to prioritise the energy renovation of the damaged buildings, the maximum threshold can be adjusted to the effect that 15% (16%-1%) of the non-residential building stock is above the new threshold. Member States should ensure that a similar number of buildings undergo energy renovation. In this example, the 1% of the building stock that was damaged should be renovated. The threshold should be adjusted once prioritisation of the renovation of the damaged buildings ends. The use of this option should be accompanied by a relevant disaster declaration.

2.3.3. STEP 3: Design MEPS governance and rules of compliance

Once the calculations have been completed and the values for the thresholds have been determined, the legal framework and rules of compliance have to be laid down. This includes appointing the relevant authorities, defining the means to show compliance, the compliance procedure, criteria for exemptions, process to apply for exemptions, etc. Figure 10 presents the recommended general steps to design the legal architecture of the MEPS scheme. These steps are not exhaustive and additional elements may be needed according to the particularities and specificities of each Member State. Even though the steps are presented in a linear flow, the process will include iterations, feedback and adjustments across the different elements defined in each step. The following sections present recommendations for each of the steps presented, except for the last step on monitoring and penalties. For details on that step, see STEP 5: Set up monitoring mechanism and penalty scheme.

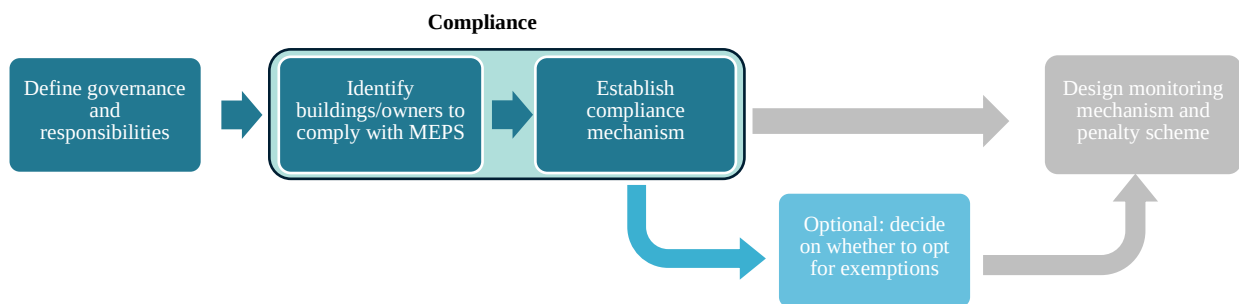


Figure 10. Steps to design the legal architecture of the MEPS scheme

All these choices need to be integrated into a clear plan and timeline for compliance during the different stages (i.e. before 2030, between 2030-2033, 2033-2040 and 2040-2050). This will allow building owners and tenants to better prepare and react on time to the MEPS requirements. It is recommended to design the legal architecture for the MEPS scheme and the compliance mechanism at an early stage and communicate them clearly to the building owners, authorities, construction associations and any other key actors to reduce uncertainties, disinformation and incomplete assumptions from the different groups of key stakeholders.

2.3.3.1. Governance and responsibilities

Member States must incorporate Article 9(1) and the resulting thresholds into national law and put in place a MEPS scheme that can be enforced at the level of the building owner. Assigning relevant authorities, defining their responsibilities and setting up a compliance scheme are crucial parts of the architecture of a MEPS scheme. The MEPS architecture has to ensure that owners of non-residential buildings above the threshold are adequately informed well in advance about key aspects of the scheme, including available technical and financial support (as required under Article 9(4)) and information on how to show compliance.

2.3.3.1.1. Appointing the relevant authorities

Member States may design a **centrally** organised MEPS scheme e.g. by creating a central register for all non-residential building owners administered by a central public authority that would also be responsible for compliance checks.

Alternatively, they could decide to organise a **decentralised** MEPS scheme, assigning responsibilities e.g. to local authorities or municipalities or public one-stop shops, or commission the implementation to energy agencies to enact the scheme on a regional or local scale. In both cases, Member States must clearly set out the mandate to the respective implementing authority and provide sufficient resources to ensure smooth implementation. Revenues could be used from the penalty scheme to (partly) finance the administrative costs of the MEPS scheme (see STEP 5: Set up monitoring mechanism and penalty scheme).

Roles and responsibilities need to be defined for activities such as notifying and contacting building owners who must comply with the MEPS obligation, managing and checking the quality of the compliance evidence, managing the monitoring and penalty scheme, designing the technical and financial support tools etc. Actors that are already in regular contact with building owners, such as facility or building energy management companies or those carrying out inspections, may also be suited to taking over a role in MEPS governance.

The clear identification of implementing authorities, roles and responsibilities and communicating this to building owners is particularly important. This allows building owners to be able to better understand the scheme and, critically, be able to direct enquiries or submit necessary documentation to the relevant authorities.

An important task for the implementing authority is to identify owners of those buildings with energy use above the different applicable thresholds. The architecture of the scheme must clarify how to access owners of buildings that are likely to be part of the MEPS obligation. Implementing MEPS at a regional/local level may be advantageous as local actors, in particular municipalities, may make use of locally available data and information, such as registries of landlords, local homeowner associations, business registers and others.

A centrally administered scheme may however allow for a more consistent enforcement of the scheme.

2.3.3.1.2. Engaging with building owners

It is recommended to make publicly available all the thresholds, timeline, compliance mechanism, penalty schemes and other elements of the enforcement procedure for all the relevant actors as soon as possible and in a clear way.

When informing the building owners/tenants about the compliance requirements, it is recommended to emphasise the subsequent thresholds and the timeline that may apply to their buildings. This way, the owners of the worst-performing 16% and 26% of non-residential buildings are able to plan a renovation in view of the energy performance thresholds for 2030, 2033, 2040 and 2050. This will maximise benefits, minimise costs, avoid lock-in effects and encourage building owners to align the level of ambition of the renovation and planning of their individual renovation projects with the NBRP (Article 3).

Outreach to specific building owners should be accompanied by information provided to building owners on details of the requirements, subsequent thresholds, timeline, general benefits of renovation, available one-stop shops and other available technical assistance, financing instruments, the post-renovation compliance mechanism and any other relevant information (see also STEP 4: Set up an enabling framework).

Engagement with building owners can occur at different stages of the compliance mechanism designed by the relevant authorities. Examples include:

- Informal support to help understand the MEPS scheme, e.g. through workshops, information through owner associations, stakeholder associations, communication in media, flyers, etc.
- Technical support, e.g. from one-stop shops, to help identify the most appropriate renovation measures for improving energy performance.
- Formal compliance actions by relevant authorities such as a formal notice for compliance.
- Timing (procedure and deadlines) and means to provide evidence for compliance if building owners consider the energy use of their building to not be above the applicable threshold. If, for example, the building owner registers a valid EPC proving that the building is performing better than the threshold, they can free themselves from the requirement to renovate the building.
- Timing (procedure and deadlines) and means to provide evidence when a building falls under a building category exemption or under an individual exemption (case of hardship).
- Timing (procedure and deadlines) and means to provide evidence for compliance after renovating the building due to MEPS.
- In the case of failure to comply, a formal action according to Article 9(7), taken by relevant authorities and if necessary, by courts can be the following stage.

2.3.3.2. Compliance: identifying buildings/owners to comply with MEPS

The relevant authorities need to develop a method to identify the buildings that must meet the thresholds of the MEPS scheme. The EPBD recast does not specify how this should be done, giving Member States flexibility on this point.

A starting point can be the characterisation of non-residential building stock as explained in STEP 1: Identify data sources and characterise the non-residential building stock. Estimates on final or primary energy use based on certain technical characteristics of buildings can be used to identify the buildings that are likely to have energy use above the applicable threshold. This method alone might however not be sufficient and it is recommended to combine it with other strategies to identify the buildings and their owners that need to comply with the MEPS scheme.

For buildings with an EPC, authorities can use the data in the EPC database to assess whether the building meets the threshold. Owners of these buildings can then be notified in advance about the need to comply with the MEPS obligation. Adjustments to the values in the EPC might be necessary if the assumptions for calculating energy performance have

changed, such as changes in primary energy or weighting factors. In addition, the data in the EPCs might be outdated if a renovation occurred since the EPC was issued.

Another option is to use building owner registers or landlord licensing systems⁷. These can be put in place at local or national level to promote self-registration of building owners and supply information on the energy performance of their building. Landlord licensing systems that require minimum information about the properties and owners can also make it easier to identify buildings in the rental market that are above the maximum energy performance threshold.

Coordination across public institutions and offices that issue different licences or permits may enable the identification of targeted buildings. If e.g. a building owner applies for a rental licence or other permits (e.g. hotel operating permit), this can be an opportunity to check/request evidence on the energy performance of the property. Whenever a new EPC is issued due to the building being sold, rented out to a new tenant or when a rental contract is renewed, this represents an opportunity to identify the energy performance of the building as well. The relevant authority responsible for compliance with the MEPS scheme could be automatically notified when a new EPC above the current applicable threshold is registered in the national EPC database. Similarly, an update to an EPC that brings the performance below the threshold could be used to exclude the relevant building from the category of non-compliant buildings.

2.3.3.3. Compliance: Establishing a compliance mechanism

To meet the MEPS obligation, buildings with energy use above the thresholds shall be renovated to improve their performance to levels below the respective thresholds. Renovation measures shall improve the performance of the building in terms of energy use directly considered when determining the energy performance of the buildings according to Annex I (1). The eligible measures to improve the energy performance of the building and comply with the MEPS obligation therefore include the energy renovation of the building envelope and replacement of technical building systems, including the technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site generated renewable energy, or a combination of them.

Evidence that the threshold has been met should be derived from a consistent approach, with a clear methodology and timeline to avoid ambiguity. The compliance mechanism should consist of three key elements:

- established mechanism recognised at national level;
- evidence to be supplied;
- subject to quality assurance.

⁷ A licensing system for landlords requires building owners who let non-residential properties to apply for a licence to be allowed to rent out a building.

Examples of a compliance mechanism include EPCs, a checklist with predefined measures, existing national benchmarking schemes (e.g. BREEAM, DGNB), and others. If such benchmarking schemes do not exist or require modifications, it is necessary to develop them early within the timeline of the enforcement period.

Evidence could be issued by a third-party provider (e.g. a registered independent expert for an EPC). This is both to exclude conflicts of interest and to ensure that the assessment has been done according to the recognised methodology.

The evidence must go through a quality assessment procedure carried out by an independent party. It is recommended to involve the relevant authorities to validate the quality.

The EPC scheme, available in all Member States, is a recognised evaluation tool and complies with all the criteria above. It is therefore recommended to use EPC as the basis for the compliance mechanism.

The following subsections provide more information on the timing of compliance, together with two examples of compliance mechanisms: EPCs and a list of renovation measures.

2.3.3.3.1. Compliance timing

It is necessary to clearly define which compliance mechanism will be applicable and the rules in terms of the issuing, quality and characteristics of each of them. It is recommended to establish these elements early enough so they can be communicated explicitly and on time to the building owners that must comply with the MEPS obligation.

The timeline should be aligned with the provisions in Article 9(1), i.e. the first applicable threshold by 2030, second applicable threshold by 2033 etc. It is recommended to include regular reminders of the MEPS obligation and compliance deadlines. Consequences and penalties for non-compliant building owners should be communicated as well (see STEP 5: Set up monitoring mechanism and penalty scheme).

Compliance checks are relevant in two points in time: a) for cases where building owners consider that their property is already compliant at the time of notification of the MEPS obligation, therefore well before the threshold dates as defined in Article 9(1); b) for regular cases where building owners conduct renovation activities after the notification of the MEPS obligation to improve the energy performance of the building below the applicable threshold. In both cases, the quality and control requirements (clear methodology, issued by a third party, subject to quality checks) of the compliance mechanism must be applied.

Since the identification of buildings and building owners that must comply with the MEPS obligation may rely in some cases on data collected before the implementation of the MEPS scheme and estimations, there may be cases where buildings identified as buildings with energy use above the maximum threshold are in reality already compliant with the MEPS obligation as their energy use is indeed lower than the threshold.

Where the identified buildings have an energy performance above the applicable threshold, the compliance timeline can be aligned with the timeline described in Article 9(1), i.e. 2030 for the first threshold, 2033 for the second threshold, etc. In these cases, building owners must conduct renovation activities to bring the building's energy performance below the applicable threshold by the specified dates. Member States could also establish earlier timelines for building owners to show compliance.

2.3.3.3.2. Evidence of compliance by EPCs

Proving compliance by EPC requires the building owners to provide a valid EPC of their property to show the energy performance of the building calculated according to Annex I (1).

To be valid as a compliance mechanism, an EPC shall include the information on the indicator selected for the MEPS scheme, i.e. the information on final energy use or primary energy use. If the EPC does not include the data about the main indicator (e.g. final energy consumption) or is not up to date (e.g. the building underwent renovation measures after the EPC was obtained), other compliance mechanisms shall be applied.

If the renovation triggered by the MEPS is a major renovation, an EPC must be issued according to Article 20. Member States should make use of this trigger and leverage the EPC as a compliance mechanism. The relevant authority responsible for compliance with the MEPS scheme could be automatically notified when a new EPC for buildings under the MEPS scheme is registered in the national EPC database. This can be linked to the monitoring mechanism and the national database for the energy performance of buildings that needs to be set up in accordance with Article 22.

2.3.3.3.3. Evidence of compliance based on a list of renovation measures

Another compliance mechanism could require building owners to provide evidence on the implementation of renovation activities taken from a list of measures linked to minimum technical requirements and resulting estimations of energy performance improvements.

This compliance mechanism can be implemented in two ways: a) based on a predefined list of minimum measures with requirements for the building components; b) based on the list of renovation measures recommended in the individual building EPC or renovation passport (if available). In both cases, Member States shall establish a clear methodology, including a definition of the evidence that must be provided, who must provide it (self-disclosure, third party), and a methodology to assess whether the energy performance of the building was improved to levels below the maximum energy performance threshold applicable. This approach must in any case ensure that the energy performance of the building is well established, and that the energy performance threshold established at national level is met.

For the first approach, Member States define a list of minimum measures that would improve the energy performance of the building so it complies with the MEPS obligation. The list would for example provide a default value for the replacement of windows with a maximum U-value (lower than the previous windows) or an increase in wall insulation by a few centimetres. These values can be estimated based on current renovation practices and technological developments, common measures implemented in different non-residential building segments, or energy modelling of multiple representative buildings.

The measures shall improve the performance of the building in terms of energy use for space heating, space cooling, domestic hot water, ventilation, built-in lighting or other technical building systems as these are the elements that have an impact on the calculation of the energy performance of the buildings according to Annex I (1). Examples of measures include:

- (a) improving external wall insulation, roofs and other envelope elements such as windows and doors;
- (b) replacing the heating system by a more energy-efficient one;
- (c) installing building automation and control systems to monitor, control and optimise energy performance;
- (d) installing a renewable energy system on site.

Building owners or a designated third party (e.g. contractor, external assessor) shall provide evidence (e.g. proof of payment) of the renovation measures from the predefined list of minimum measures that were implemented in the building. The energy performance of the building after applying the estimated energy improvements shall be below the maximum energy performance threshold applicable. The energy improvements achieved can be estimated by adding up the energy improvement potential⁸ of the renovation measures implemented. Member States shall ensure that a suitable methodology is implemented. The choice of indicator may have implications on the choice of renovation measures (see Table 2).

The second approach for compliance based on a list of renovation measures is linked to buildings with a valid EPC (including renovation recommendations) or a renovation passport. In this case, building owners or a designated third party shall provide evidence to demonstrate that the renovation measures recommended in the EPC or renovation passport of the building were implemented.

Like in the previous approach, the energy performance of the building after applying the overall energy improvements achieved through the renovation measures implemented must be lower than the maximum energy performance threshold applicable. The overall energy improvements can be estimated based on the energy savings projected in the EPC or renovation passport (if included). Alternatively, they can be based on predefined default values for energy improvements associated with each measure, as discussed for the previous approach.

2.3.3.3.4. Other considerations regarding compliance

Member States shall ensure the quality of compliance evidence. If compliance is based on EPCs, EPCs issued after the recast EPBD has been transposed must fulfil the relevant provisions introduced in Articles 19 and 20, and in Annexes I and V.

If Member States implement any of the two approaches based on a list of renovation measures, it could be established that the evidence provided and the estimations for the energy performance improvements are subject to third-party quality checks and control. Also, the relevant authority shall validate the quality based on random sampling at least.

⁸ Member States can develop a predefined list of measures, including the potential energy improvement achieved if each individual measure is implemented. For instance, it is estimated that by replacing single-glazed windows with triple-glazed windows, the energy savings would be x%.

If building owners provide the evidence themselves, the checks and control shall be stricter to ensure adequate quality of the evidence provided and ensure equal treatment.

Allowing different ways to prove compliance may offer more flexibility to building owners to fulfil the requirement and encourage reporting from building owners.

Member States may use different compliance mechanisms for different building categories. Compliance mechanisms can be linked to additional benefits or incentives, such as receiving certification for the improvement achieved or registering the property in a public list of compliant buildings, which building owners/tenants can use to promote their properties.

Financial institutions can play a key role not only in providing information on benefits and opportunities for renovation, but also in facilitating loans to cover renovation investments necessary to comply with MEPS.

2.3.3.4. Optional: allowing for exemptions of individual buildings

The recast EPBD allows Member States to exempt certain categories of buildings under Article 9(6) and to exempt individual buildings under Article 9(1). Both provisions are optional and have different effects on the application of MEPS. For the exemption of building categories under Article 9(6), please see Section 2.3.2.2.1. This section covers the exemptions for individually identified buildings under Article 9, paragraph 1, subparagraph 8.

The buildings exempted on an individual basis through the criteria established by the Member States shall not be removed from the baseline for the MEPS scheme. Instead, the sum of the unrealised energy performance improvements must be compensated by achieving equivalent energy performance improvements in other parts of the non-residential building stock (see section 2.3.3.4.3.2 ‘Quantifying equivalent energy improvements’).

If Member States decide to implement the option of exempting individual buildings, they shall establish a set of criteria that is clear, precise and stringent. These criteria must be reported in the NBRPs as per Article 3 of the recast EPBD. The criteria to exempt individual buildings may reflect three reasons: a) expected future use of the building; b) serious hardship; c) unfavourable cost-benefit assessment (see ‘Criteria for exemptions for more details’).

They must be selected in such a way that exemptions are allowed only in exceptional cases and on the condition that evidence shows that compliance with the requirements is impossible for a specific building. Such conclusions can only be made on a case-by-case basis, and Member States should not introduce systematic exemptions for any category of building. Building owners must prove that a specific criterion applies to request an individual exemption.

The conditions under which the application of exemption criteria is evaluated should be defined at Member State level or, where regional conditions affect only part of a Member State’s territory, at regional level. However, in the latter case, regional conditions should be described in the NBRPs. In all cases, these conditions should be documented (e.g. as part of technical guidelines) and should apply uniformly to the national, or, where applicable, regional territory. Exemption criteria should be clearly communicated to building owners as

part of the overall MEPS scheme. Finally, the non-application of requirements should be assessed using clear procedures established and supervised by public authorities.

It is recommended to publish the criteria early on and set up a clear timeline and procedure for building owners to notify exemptions. The applicable evidence (e.g. demolition certificate, unfavourable cost-benefit assessment carried out by a third party) must be unambiguous and clear for each of the three exemption categories.

2.3.3.4.1. *Ex ante* report on estimated individual exemptions

If Member States allow for individual exemptions based on criteria in accordance with Article 9(1), subparagraph 8, they must carry out an *ex ante* assessment of the potential share of buildings covered by these exemptions. This assessment must be reported in the NBRPs as referred to in Article 3. Member States must ensure that they do not exempt a disproportionate number of non-residential buildings. Factors influencing whether the number of exempted buildings is disproportionate include the additional administrative effort to monitor exemptions and plan for alternative measures.

There are different ways to carry out the *ex ante* assessment of the potential share of individually exempted buildings. Member States could make estimates based on the typical use and characteristics of the building stock and their occupants. Alternatively, they could require building owners to apply for an exemption upfront by registering it in a central register by a specific date and proving that they meet the criteria established by the Member States. The second approach is more precise and may increase building owners' awareness of their buildings' energy performance. It also allows for better planning of renovation measures to be implemented elsewhere. Member States may also opt for a combination of those approaches.

It is recommended that Member States check the number and floor area of exempted buildings *ex post* to verify if the number aligns with the *ex ante* estimates.

2.3.3.4.2. Criteria for exemptions

Under Article 9(1), the criteria to exempt individual buildings may reflect three reasons: (a) expected future use of the building; (b) serious hardship; and (c) unfavourable cost-benefit assessment.

The criteria must be defined as specifically and clearly as possible and be underpinned with indicators to demonstrate eligibility. It is recommended that the building owner applies for an exemption before the enforcement date and provides proof of eligibility that can be verified by a third party or relevant authority. Evidence for the exemption application shall be defined according to the applicable criteria. Examples of criteria are presented in the following subsections.

2.3.3.4.2.1. Expected future use of the building

The criterion related to the expected future use of the building addresses situations where, due to a change in usage pattern, renovating the building would not be beneficial or the building would no longer fall within the scope of the requirement. Examples of this:

Plans to convert the building into a residential building: If a building owner plans to convert an existing non-residential building into a residential building, it may be exempted from the MEPS obligation. The building will then fall under Article 9(2). Adequate proof must be provided, e.g. a valid building permit, contracts to prove that construction work has been commissioned etc.

Plans to convert the building into another category of non-residential building within the scope of Article 9(1): The conversion of a non-residential building from one category to another (e.g. from hotel to office building) does not qualify for an exemption to comply with the MEPS obligation. The threshold for the future use category of the building would apply in this case.

Plans to convert a non-residential building into another category of non-residential building that would fall within the scope of Article 9(6): The conversion of a non-residential building under Article 9(1) to a building that would be eligible for exclusion from the MEPS scheme under Article 9(6), e.g. buildings used for worship, conversion to a non-residential agricultural building or a building to serve national defence purposes, may be exempted from compliance with the MEPS obligation. Another example can be buildings within the process of becoming officially protected as part of a designated environment or because of their special architectural or historical merit. If exempted, the building needs to be removed from the baseline, or energy performance improvements must be achieved in other parts of the building stock. Adequate proof must be provided, e.g. a valid building permit, contracts to prove that construction work has been commissioned, or a certificate proving the status of a protected building.

Plans to demolish the building: Planned demolitions are explicitly mentioned as a special situation that qualifies for individual exemptions under Recital 26 of the recast EPBD. When individual buildings to be demolished are exempted from the MEPS obligation, Article 9 states that equivalent savings must take place in other parts of the non-residential building stock. A demolition permit can serve as proof of the intended future use of a building.

If the future use of a building qualifies for an exemption from the MEPS obligation, the building owner must provide appropriate evidence. It is recommended to establish a clear timeline for the application process, aligned with the enforcement procedure of the MEPS scheme.

It is also recommended to establish a clear timeline in terms of fulfilling the change of use. For example, if a building owner plans to change the use of the building, but does not do so within a given timeframe, then the obligation to renovate should apply.

2.3.3.4.2.2. Serious hardship

The criterion of serious hardship is intended to reflect a severe but temporary situation and needs to be justified by the individual situation of a building owner or tenant. As indicated in Recital 26, ‘cases of serious hardship justify an exemption for as long as the hardship persists’. Serious hardship exists, for example, if the building’s owner or tenant faces liquidity problems, is threatened with bankruptcy or made a certain percentage of staff redundant within the past year.

Liquidity problems: These could be proven e.g. by financial statements, bank statements, tax returns, credits reports, audit reports and others. Clear conditions and rules should be defined to make sure that exemptions based on this criterion are applied fairly.

Threatened with bankruptcy: If threatened with bankruptcy, the building owner has to provide similar evidence as for liquidity problems. In addition, the owner needs to indicate future profit projections for the upcoming year that should be based on previous years and compared to the investment costs or rent increases due to renovation work. These costs must be substantiated, e.g. by three independent advisors’ offers. Additionally, actual

profits should be submitted annually to demonstrate that the assumptions were reasonable. If the profits are higher than projected, the criterion does not apply and the exemption may be lifted, and the obligation to comply with MEPS will apply.

Sickness: Serious individual situations (such as sickness) may be considered as serious hardship if the building owner is a small or medium-size company or private building owner. The building owner then has to provide a medical certificate and show that there is no alternative person who can be responsible for fulfilling the MEPS obligation.

Recently becoming a building owner: There are circumstances whereby a person suddenly became a building owner (e.g. by inheriting a leased building) that would make it very difficult to carry out required renovation work immediately. This case may qualify for a short exemption from the requirement to comply with the MEPS obligation.

2.3.3.4.2.3. Unfavourable cost-benefit assessment

For the criterion based on c) (unfavourable cost-benefit assessment), Member States' criteria need to be able to assess whether the costs to conduct the renovation measures in order to comply with the MEPS obligation are proportionate, and whether the expected benefits outweigh the costs, allowing for a comparison of alternatives. They shall do this by carrying out a cost-benefit assessment for planned renovation measures at individual building level.

A cost-benefit assessment is a tool used to evaluate the costs and benefits of various renovation measures for a building. This evaluation is conducted in monetary terms and considers factors such as construction costs, energy savings, increased property value and maintenance savings. The calculation should also include the costs and benefits of environmental and health externalities, aligning with the aim of the recast EPBD of increasingly take environmental and health externalities into consideration (see e.g. Articles 2(32 iv) and 13). A thorough cost-benefit assessment needs to consider the lifespan of the building and each renovated component, as different elements will have varying durations of effectiveness and costs over time.

If Member States allow for individual exemptions due to unfavourable cost-benefit assessments, they need to provide a clear and publicly available framework to carry out the assessment. This involves defining the calculation steps and parameters to be considered in the assessment, including average values for the lifetime of building components, discount rates to determine the net present value, reference values of costs for certain measures, etc. Member States should set up a scheme to verify the calculations, e.g. checklists to be verified by the relevant authority or requiring independent experts to provide calculations to validate the findings. Member States may reject applications if the cost-benefit assessment is not carried out according to the pre-established framework.

A cost-benefit assessment is considered unfavourable if the resulting net present value, including its externalities, is negative throughout the remaining lifetime of the building. Alternatively, the return on investment could be calculated, i.e. the net benefits (i.e. total present value of the benefits minus total present value of costs) divided by the total costs, and be used as an indicator.

The calculation must detail the costs and benefits associated with single measures to evaluate which measures would still result in a favourable cost-benefit assessment. Article 9(1) subparagraph 10 states that Member States must require, in the event of an unfavourable cost-benefit assessment, that at least those individual renovation measures

with a favourable cost-benefit assessment are implemented. The calculation should therefore allow for a comparison of the alternatives. For example, for the replacement of an old and depreciated boiler the assessment of economic costs should e.g. consider alternatives such as a gas boiler and a heat pump and compare the costs for the gas boiler with the costs of the heat pump, taking the lower operating costs and environmental benefits of the latter into account.

The renovation passport (Article 19, Annex XIII) could be a useful tool to help Member States and building owners carry out a cost-benefit analysis if the passport is available. It provides details on the different renovation steps and the costs associated with those measures, taking the individual buildings renovation roadmap into account over time.

2.3.3.4.3. Equivalent improvement in other parts of the building stock due to exemptions

2.3.3.4.3.1. Quantifying unrealised energy improvements

The sum of the unrealised energy improvements due to the exemption of individual buildings must be compensated by achieving equivalent improvements in other parts of the non-residential building stock. Member States shall monitor the renovation activities for these equivalent improvements. An estimation of equivalent energy performance improvements shall be reported in the NBRPs as referred to in Article 3.

The total unrealised energy improvements correspond to the sum of the unrealised improvements of all the buildings exempted. The unrealised energy improvements for a single exempted building can be estimated based on the difference between the current energy performance and the threshold to be reached as described by the equation below. For instance, if an exempted building with a floor area of 500 m² and an energy performance of 350 kWh/(m²y) was expected to comply with the MEPS obligation of a threshold of 280 kWh/(m²y), the unrealised energy improvements would correspond to 35 000 kWh/y. The floor area must be the same floor area that was used to determine the energy performance of the building to ensure consistency in the calculation.

$$Unrealised\ improvements_j = (EPerformance_j * A_j) - (Threshold * A_j)$$

- Unrealised improvements_j: unrealised improvements of building j, in kWh/y
- EPerformance_j: current energy performance of building j, in kWh/(m²y)
- A_j: floor area of building j

The unrealised energy improvements shall be calculated for every single building that is exempted. The total unrealised improvements are then calculated by adding up the unrealised improvements of all exempted buildings:

$$Total\ unrealised\ improvements = \sum Unrealised\ improvements_j$$

The unrealised energy improvements can also be estimated based on the effect of a list of minimum measures that would be necessary to improve the energy performance of the building so it goes below the threshold. The allocation of standard energy savings to these measures will allow for an estimate of their impact on the overall energy performance. The implementation of the measures in the list should improve the building's energy performance in terms of energy use for space heating, space cooling, domestic hot water, ventilation, built-in lighting or other technical building systems as specified within the

common general framework for calculating the energy performance of buildings in Annex I (1). Examples include installing a renewable energy system on site, improving external wall insulation, roofs and other external elements such as windows and doors, replacing the heating system with a more energy-efficient one, installing building automation and control systems to monitor, control and optimise energy performance.

For this approach, default energy savings are allocated to each measure based on common practices, renovation statistics, technical studies, etc. The effect in terms of energy performance improvements of implementing them on the building being exempted is then estimated, i.e. the energy performance of the building before and after the hypothetical implementation is compared and the unrealised energy improvements calculated. The floor area must be the same floor area that was used to determine the energy performance of the building to ensure consistency in the calculation.

$$\begin{aligned} \text{Unrealised improvements}_j &= (E\text{Performance}_j * A_j) - (E\text{Performance}_j * A_j * (1 \\ &- \sum \text{Measure energy savings}_i)) \end{aligned}$$

- Unrealised improvements_j: unrealised improvements of building j, in kWh/y
- EPerformance_j: current energy performance of building j, in kWh/(m²y)
- A_j: floor area of building j
- Measure energy savings_i: energy savings associated with the implementation of the renovation measure I, in %
- i: set of renovation measures in the predefined list

As before, the unrealised energy improvements shall be calculated for every single building that is exempted. The total unrealised improvements are then calculated by adding up the unrealised improvements of all exempted buildings:

$$\text{Total unrealised improvements} = \sum \text{Unrealised improvements}_j$$

2.3.3.4.3.2. Quantifying equivalent energy improvements

The total unrealised energy improvements must be compensated by achieving equivalent energy performance improvements in other parts of the non-residential building stock. Taking the example from the previous section: the unrealised 35 000 kWh/y energy improvements of the exempted building could be obtained by renovating a building with a floor area of 700 m² and energy performance of 250 kWh/m²y if its energy performance is reduced to 200 kWh/(m²y) (calculated as 250 kWh/(m²y) – (35 000 kWh/y/700 m²)). The energy improvements can be calculated using the following equation:

$$\begin{aligned} \text{Energy improvement}_k &= (E\text{Performance before renovation}_k * A_k) \\ &- (E\text{Performance after renovation}_k * A_k) \end{aligned}$$

- Energy improvement_k: energy improvement achieved in an individual building in other part of the non-residential building stock, in kWh/y
- EPerformance: Energy performance in kWh/(m²y)
- A_k: floor area of building k

The unrealised energy improvements can be implemented on a one-by-one basis. This requires monitoring that the unrealised energy improvements of exempted building j are equal to the energy improvements of building k in other parts of the building stock. However, the total equivalent energy improvements of all renovated buildings in other parts of the building stock can also be aggregated and then compared to the total unrealised energy improvements calculated in the previous section. The total equivalent energy improvements can be calculated by adding up the improvements of each single building k:

$$\text{Total equivalent improvements} = \sum \text{Energy improvements}_k$$

The total equivalent energy improvements achieved in all buildings in other parts of the non-residential building stock shall be equal to or higher than the total unrealised energy improvements as calculated in the previous section.

$$\text{Total equivalent improvements} \geq \text{Total unrealised improvements}$$

2.3.3.4.3.3. Ways to achieve equivalent energy improvements

There are different ways to achieve equivalent improvements. One approach is to achieve the unrealised improvements by renovating individual buildings in the better performing part of the non-residential stock, as illustrated in Figure 11. In the example, the red building (see Figure 11(a)) applied for an exemption⁹. Figure 11(b) illustrates how to quantify the unrealised improvements. Equivalent improvements equal to or larger than the unrealised improvements are to be achieved by renovating other buildings out of the MEPS scheme (green buildings). This may require additional renovation schemes that target those buildings. This approach provides flexibility in targeting different buildings, but may require a high monitoring effort to keep track of where the equivalent improvements are being achieved.

⁹ Where the exemption is based on an unfavourable cost-benefit assessment, Member States shall require that, for the exempted building, at least those individual renovation measures with a favourable cost-benefit assessment are implemented.

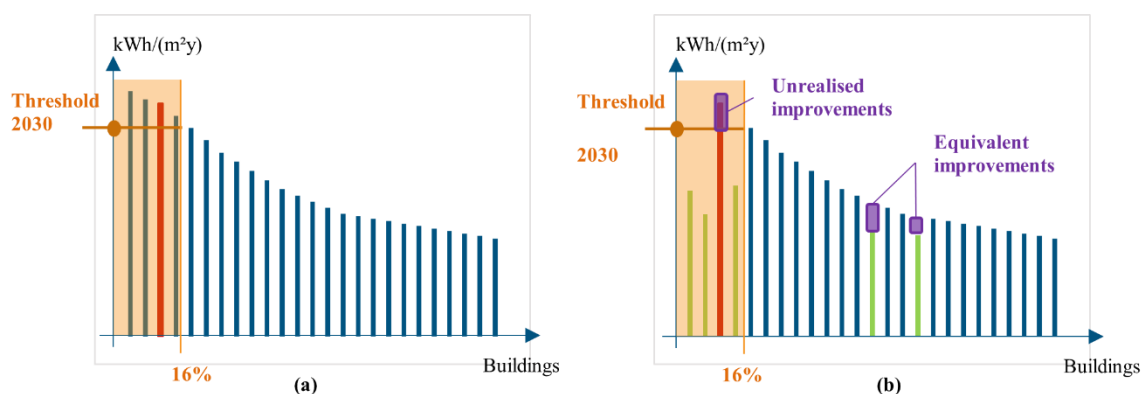


Figure 11. Exemptions: (a) Building exempted; (b) Achieving equivalent improvements in other parts of the non-residential building stock

A second approach aims to achieve additional energy improvements when renovating the buildings that are above the next threshold (see Figure 12). This approach facilitates the monitoring process since the targeted buildings for the equivalent improvements correspond only to the next set of worst-performing buildings instead of the entire portion of buildings out of the MEPS scheme. This approach also accelerates the renovation of the worst-performing buildings, but may require additional support mechanisms to encourage building owners to renovate their buildings earlier than the predefined deadline.

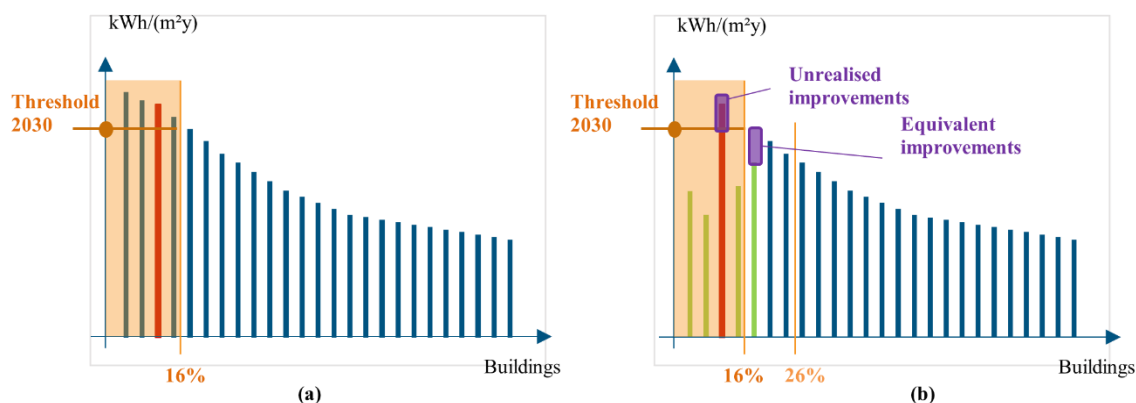


Figure 12. Exemptions: (a) Building exempted; (b) Achieving equivalent improvements in the next worst-performing non-residential buildings

2.3.4. STEP 4: Set up an enabling framework

2.3.4.1. Purpose of the enabling framework and key considerations

In order to support compliance, Member States must set up an enabling policy framework in accordance with Article 9(4) and Articles 17 and 18. While the policy framework in accordance with Article 9(4) has to be fully available, not all measures need to be available for all types of buildings or building owners. The choice for enabling measures partly depends on the national or local context as well as specific MEPS design choices. An analysis of existing practice shows that there are key general supportive measures, including:

- a. Financial support schemes to ease the financial burden put on certain groups.
- b. Technical assistance at several levels:
 - a. Providing (free) advice to building owners throughout the entire renovation journey, from initial advice, in-depth analysis, support in securing financial incentives and finding contractors to quality control, e.g. through one-stop shops.
 - b. Skills in the construction value chain: a skilled workforce is required to realise the renovation boost that will be triggered by MEPS. Investments are needed in training and capacity building, developing staff and structures to make sure there are enough skilled workers to deliver the renovation wave when it arrives, in line with Article 17(12).
 - c. Supporting relevant authorities, e.g. local actors, to be able to implement the scheme.
- c. Incentivising real estate investors and owners who are considering deep renovations through instruments like subsidies, tax incentives, and green bonds to go beyond the minimum requirements in line with the provision in Article 9(4) point c) on ‘designing integrated financing schemes which provide incentives for deep renovations and staged deep renovations’ and under Article 17 and Article 17(16).
- d. Setting up or adapting financing schemes so that they include financial incentives for the issuance of renovation passports, and possibly additional investment incentives for measures recommended in a renovation passport.
- e. Actions to increase public awareness and acceptance for effective implementation of MEPS. Support can be dedicated to carrying out tailored communication campaigns and to creating a network of integrated renovation services, such as one-stop shops as required by Article 18, to make the renovation journey smoother.
- f. Special attention should be given to removing non-economic barriers such as split incentives (Article 9(4) paragraph d)) through the combination of measures, e.g. raising awareness about the increase in building value following energy renovation, technical support and legislation, for example as regards co-ownership rules, or allowing an increase in basic rent to recover the renovation cost in line with energy cost savings for tenants.

2.3.4.1.1. Addressing split incentives

While MEPS implicitly helps to overcome the lack of investments due to split incentives, the cost implications of split incentives remain. The guidance on Article 17 in Annex 2 provides options and examples of existing schemes that address split incentives.

2.3.4.1.2. Incentivising renovation of buildings eligible for individual exemptions

To be eligible for (temporary) exemptions from requirements under Article 9(1), building owners will have to individually prove compliance with the criteria set up at Member State level. This process could be used as a trigger for renovation by automatically linking the exemptions to the (partial) financing of a renovation passport, or an automatic invitation to

a one-stop shop, similar to Article 19(13), where a building owner receives an invitation to a one-stop shop if an EPC label lower than C is issued.

2.3.4.1.3. Incentivising renovation of categories of buildings that Member States may exempt from MEPS requirements

Certain categories of non-residential buildings may be exempted from the requirements of Article 9(1), making use of Article 9(6), and might possibly be overlooked in the national renovation strategies. Having an enabling framework that directs special support to these building categories may lead to substantial additional energy performance improvements in these parts of the building stock.

2.3.4.2. Mechanisms of support

Article 9(4) requires Member States to provide financial measures and integrated finance schemes as well as technical assistance as part of the enabling framework.

2.3.4.2.1. Financial support to encourage deep renovation (Article 9(4)(c))

Building owners and investors should be incentivised to go beyond the maximum energy performance thresholds defined in Article 9(1). This can be achieved through premiums for one-stage deep renovations that directly meet the longer-term requirements. The early determination of the 2040 and 2050 targets for non-residential buildings at Member State level is therefore highly recommended. Financial support can then be staggered according to the performance level achieved. If building owners opt for a stepwise renovation, financing a renovation passport as well as supporting the implementation of the proposed steps before the MEPS enforcement dates is another way to design financial support.

Additional clarifications and examples are provided in The guidance on Article 17 in Annex 2.

2.3.4.2.2. Technical assistance

Building owners who are affected by MEPS should be well informed before it enters into force. Targeted information campaigns, for example distributed through property associations or municipalities, must be easy to grasp when explaining the reasons behind the requirements, as well as when and how to comply, including links to energy experts, one-stop shops or financial support programmes.

One-stop shops are particularly well positioned to distribute information on the requirements for building owners, but also to guide them through the renovation process, including financing (see Article 18 of the recast EPBD, Article 22(3) point (a) of Directive (EU) 2023/1791 and the respective guidance documents).

Revenues from emissions trading or from fines collected through the penalty mechanism to enforce MEPS can be partly used to finance the necessary institutional settings and technical assistance, and partly to finance targeted support to the building owners experiencing serious hardship (see ‘Criteria for exemptions’).

2.3.5. STEP 5: Set up monitoring mechanism and penalty scheme

Article 9(7) states that ‘Member States shall take the measures necessary to ensure the implementation of minimum energy performance standards, including appropriate monitoring mechanisms and penalties in accordance with Article 34.’ In that sense, Article 9(7) can be considered as a reminder of the general obligation of Member States to monitor and enforce EU Directives.

2.3.5.1. Monitoring

The first task is therefore to define a mechanism to identify (non-)compliance by the reference dates 2030, 2033 and later. One way to do this is to establish a registry for non-residential buildings above the maximum energy performance thresholds in accordance with Article 9(1). The registry could be created when identifying these buildings for compliance purposes (see ‘Compliance: identifying buildings/owners to comply with MEPS’) and can be linked to the national database for the energy performance of buildings, which needs to be set up in accordance with Article 22. The registry would be updated once a building owner provides evidence of the necessary energy performance improvements bringing the building below the maximum threshold and therefore complying with the requirements of the MEPS scheme.

To support compliance, relevant authorities could remind building owners on a regular basis, e.g. once a year before the reference date of the upcoming duty to comply (e.g. 2030). On that occasion, building owners should be informed about potential penalties in case of non-compliance as well as available measures to support implementation. Immediately after the reference date (e.g. after 2030), remaining non-compliances would be retrieved from the database, and another last reminder could be sent with a last deadline of a few months to prove compliance. After that deadline, an enforcement procedure would need to be started.

2.3.5.2. Penalty scheme

Member States shall introduce rules and sanctions for breaches of the MEPS obligation. The penalties must be effective, proportionate and dissuasive, as set out in Article 34 of the recast EPBD. Article 9(7) specifies that when laying down the rules on penalties, Member States shall take into account the financial situation and access to adequate financial support of homeowners, in particular for vulnerable households.

Penalties can be defined for different stages of the enforcement process. For instance, if a Member State implements a building owner register or a landlord licensing system and a deadline for the self-registration of building owners and properties, a penalty for not registering the relevant data on time can be implemented. At another stage, a penalty scheme can be set for building owners who stated that their building was already compliant at the moment of the notification of the MEPS obligation and failed to provide the evidence required by the compliance mechanism according to the deadline. Finally, a penalty scheme can be implemented for building owners who fail to comply with the applicable MEPS obligation by the respective deadline.

Examples of penalty mechanisms include public disclosure of non-compliant buildings, fines, restrictions on increasing the rent or selling/renting the property, and others. It is important to consider that the application of a penalty should not remove the obligation to comply. For each penalty mechanism established, it is recommended to define the timeline, the penalty for failing to comply (the first time), and the penalty for a recurrent failure to comply.

One example of a penalty mechanism would be the disclosure of non-compliant buildings in a non-compliant properties database. If building owners fail to comply with the MEPS obligation, the property is listed in the database, which could be accessed by potential renters/buyers, public authorities, key stakeholders, or even the general public. Such a penalty could be combined with other measures to increase effectiveness.

Fines as a penalty mechanism can be defined based on:

- a fixed amount, same value in euro for all non-compliant building owners;
- based on the size of the property, a certain amount of euro per m²;
- the difference between the current energy performance of the building in kWh/(m²y) and the threshold that was not complied with. For instance, if the current energy performance is 350 kWh/(m²y) and the applicable threshold is 250 kWh/(m²y), the fine is defined based on the difference (100 kWh/(m²y)) and a certain amount of euro per kWh/(m²y);
- the time without complying, e.g. a certain amount of euro per month after the deadline without complying with the MEPS obligation;
- a combination of the previous options, e.g. a fixed amount plus an extra amount based on the size of the property.

If fines are deployed as a penalty mechanism, the requirement to take into account the financial situation of building owners is particularly relevant. The fine scheme should consider the principle of proportionality so as not to impose an excessive burden on individual building owners compared to the objective of the MEPS scheme. Special circumstances such as building owners who have gone bankrupt or have another exceptional financial status shall be considered.

3. TRAJECTORY FOR THE PROGRESSIVE RENOVATION OF THE RESIDENTIAL BUILDING STOCK

3.1. Scope of the requirements

The purpose of Article 9(2) is the progressive renovation of the residential building stock to ensure that the residential segment contributes to transforming the national building stock into a zero-emission stock by 2050. It requires Member States to set out a trajectory for the gradual renovation of the residential building stock. The trajectory is expressed as a decrease in the average primary energy use in kWh/(m²y) of the entire residential stock, with binding milestones for 2030, 2035, 2040, 2045, and 2050.

This trajectory has to be in line with the national roadmap and the targets included in the Member State's NBRP and directed towards transforming the national building stock into a zero-emission stock by 2050.

The trajectory aims at improving the overall energy performance of the residential building stock, with a focus on the worst-performing buildings. The trajectory must ensure that at least 55% of the decrease in the average primary energy use for the indicated years is achieved through the renovation of buildings that belong to the 43% worst-performing residential buildings. This means that in designing the trajectory for residential building stock, Member States will identify the number of residential buildings and residential building units or floor area to be renovated annually, including the number or floor area of the 43% worst-performing residential buildings and residential building units.

To achieve the targets in their national trajectory, Member States will apply measures such as minimum energy performance standards, technical assistance and financial support to lower the average primary energy use of the entire residential building stock. While doing this, Member States will not disproportionately exempt rental residential buildings or

building units from the policy measures. Member States are free to decide whether to set minimum energy performance standards at national level and adapted to national conditions.

3.2. Definitions

3.2.1. Definition of residential buildings within the scope of Article 9

A residential building or building unit is defined in Article 2(18) as a ‘room or suite of rooms in a permanent building or a structurally separated part of a building which is designed for all-year habitation by one private household’.

For mixed-used buildings, i.e. buildings that include both residential and non-residential building units (e.g. a residential building with shops on the ground floor), Member States may identify the most appropriate approach and, according to Recital 34, may continue to choose whether to treat them as residential or non-residential buildings, or a mix of the two.

If a mixed-used building is being renovated, double counting of energy performance improvements must be avoided, so improvements must be clearly categorised as either residential or non-residential. All residential buildings come within the scope of Article 9(2), regardless of whether the owner or user is a public or private-sector body. Residential public buildings, including social housing, fall within the scope of Article 9(2).

3.3. Designing a trajectory for renovating the residential building stock

There are several steps involved in designing a trajectory and the measures needed to progressively renovate residential building stock.



Figure 13. Recommended steps for designing a trajectory for the progressive renovation of the residential building stock

To make sure all design elements are covered and a proper framework is set up, the following four steps are proposed:

- identify data sources and classify the residential building stock;
- set up the trajectory and milestones to achieve a progressive decrease in the average primary energy use;
- set the sub-target to achieve at least 55% of the decrease in the average primary energy use through the renovation of the 43% worst-performing buildings;
- adopt policy measures to reduce the average primary energy use.

The sections below provide examples and options for the different features of the Article 9 trajectory following the four steps set out in

Figure 13.

3.3.1. STEP 1: Identify data sources and classify the residential building stock

Under Article 9(2), Member States must express their national trajectory as a decrease in the average primary energy use of the entire residential building stock from 2020 to 2050.

The reference year against which any progress in average primary energy consumption is compared is therefore 2020 (from 1 January 2020 to 31 December 2020). Member States need to identify their residential building stock and its characteristics, i.e. collect and process information describing the building stock according to its main characteristics and to derive its energy performance on that basis.

The aim of this process is to set a reference value for the average primary energy use of the residential building stock in 2020, based on representative data. It should also enable Member States to set an energy performance threshold that distinguishes the 43% of residential buildings with the worst energy performance, based on either the number of buildings or their total floor area. Member States may use data for a more recent year than 2020 along with the relevant assumptions (such as new construction rates and records of renovations or demolitions) to supplement the data and achieve a realistic characterisation of the building stock in 2020.

The recommendations on planning the resources and time needed to classify the stock, on using data from EPCs (Energy Performance Certificates), the link to the database described in Article 22, the reuse and extension of existing databases and data protection that apply to residential building stock are similar to those for the non-residential building stock.

As for the non-residential stock, at least two general approaches can be used to classify the residential stock and identify its characteristics, either individually or in combination. The first approach is to use a) EPC data alongside complementary data sources and the second is b) statistical sampling and ad hoc data collection. These approaches are described in the sub-sections below.

3.3.1.1. Data sources and preliminary classification and building categories

Member States may use EPC data in conjunction with other data sources such as research results, censuses, results from energy audits or aggregated energy metering data to classify the residential building stock. Data on the physical characteristics and other features of the residential building stock such as use, construction date, typology, location, geometric features or data on technical building systems can be collected from sources that include 3D urban models, satellite images, digital building logbooks, cadastral data, building permit registers and interviews with architects or developers. It is recommended that Member States assess the quality, completeness and representativeness of the datasets to ensure that different segments of the residential stock are properly represented.

As for non-residential buildings, it is recommended to have a preliminary overview of the stock in order to classify residential buildings. It is useful to start with the overall size of the residential building stock and then estimate, for instance, the share of single-family houses, apartment blocks and other types of residential buildings.

To classify the residential building stock, it is advisable to divide it into manageable segments by size, type, façade material and building system. Patterns of common local or regional building practices can also be used as criteria for defining categories. Examples of other criteria include date of construction, climate zone and heating system technology. Reference building categories used for the purposes of the comparative methodology framework to identify cost-optimal levels of energy performance requirements could also be used. This helps divide the housing stock into building segments sharing similar characteristics, which makes it easier to develop assumptions for each segment if required, and to improve the results when estimating the energy performance of buildings for which no data is available.

3.3.1.2. Estimating the energy performance of residential buildings based on EPCs and data on the physical characteristics of the buildings

It is important to ensure that the EPCs are sufficiently representative¹⁰ of the residential building stock. Thus, EPC coverage of the residential building stock needs to be specifically assessed, including the extent to which they cover different building types, date of issue and other relevant factors.

The available EPC data can be combined with information on the physical characteristics and other features of the same buildings to create a set of reference residential buildings for each category. Data from EPCs may also be used to approximate the energy performance of buildings in the same category and buildings with very similar physical characteristics in the same area.

If the information on the energy performance of subgroups or segments of the residential sector is not representative, information on the use, construction date, typology, location, geometric characteristics or technical building systems for each individual building can be used as input into energy models to simulate the operation of buildings and estimate their energy performance. Once a set of reference buildings from the residential building stock has been selected, a simplified approach could be used to estimate the energy performance of the reference buildings.

Coupling bottom-up data (buildings' physical characteristics, location, energy performance, etc.) with top-down data (aggregated data for different energy carriers' consumption, final energy consumption, national statistics on building construction practices, etc.) can refine the classification of the residential building stock. The estimates made using bottom-up data can be compared with the available top-down data to calibrate the assumptions and estimates made.

For the purposes of Article 9(2), Member States have to describe the data sources and methodology they use in characterising the residential building stock and its energy performance in their NBRPs.

3.3.1.3. Statistical sampling and ad hoc data collection

Where the data on the energy performance of the residential building stock from EPCs or other data sources is not sufficiently representative, statistical sampling and ad hoc data collection can be used to help classify different building segments. New data can be collected to complement existing data and fill specific gaps, e.g. on building typologies, geographical areas or climate zones. Backward extrapolation techniques can help by using more recent data together with data on new buildings and demolition trends to calculate the primary energy use of a specific building segment over a previous period of time. This approach can be used on its own or alongside existing data to verify the findings and assess their plausibility.

¹⁰ A representative dataset reflects the characteristics of the whole residential building stock, mirroring for instance the relative share of different building categories according to age, size, climate region, etc.

When using statistical sampling, it is recommended to have a preliminary overview of the residential building stock that breaks it down into different categories of buildings with similar characteristics in terms of type, typology, location, date of construction and more. The different categories of buildings should be represented in the final statistical sample.

The collected information can be put into a simulation model to estimate the energy performance of the buildings. The results can then be extrapolated to the entire building stock based on the initial classification. The results can also be cross-checked with available aggregated data on the energy performance of the building stock. In this case, it is important to ensure that the indicators used reflect the energy uses covered by Annex I to the EPBD (e.g. excluding cooking).

3.3.2. STEP 2: Set the trajectory and milestones to achieve a progressive decrease in the average primary energy use

The trajectory is expressed as a decrease in the average primary energy use from 1 January 2020 to 2050. Figure 14 illustrates this concept. The average primary energy use of the residential building stock in 2020 serves as the reference point for milestones in: 2030, 2035, 2040, 2045, and 2050. Article 9(2) sets out the milestones to be achieved by 2030 and 2035, targeting reductions in average primary energy use of 16% and 20-22%, respectively. Under Article 9(2), Member States must set milestones for 2040, 2045, 2050 in line with a progressive decrease in average primary energy use with the aim of transforming the residential building stock into a zero-emission building stock by 2050.

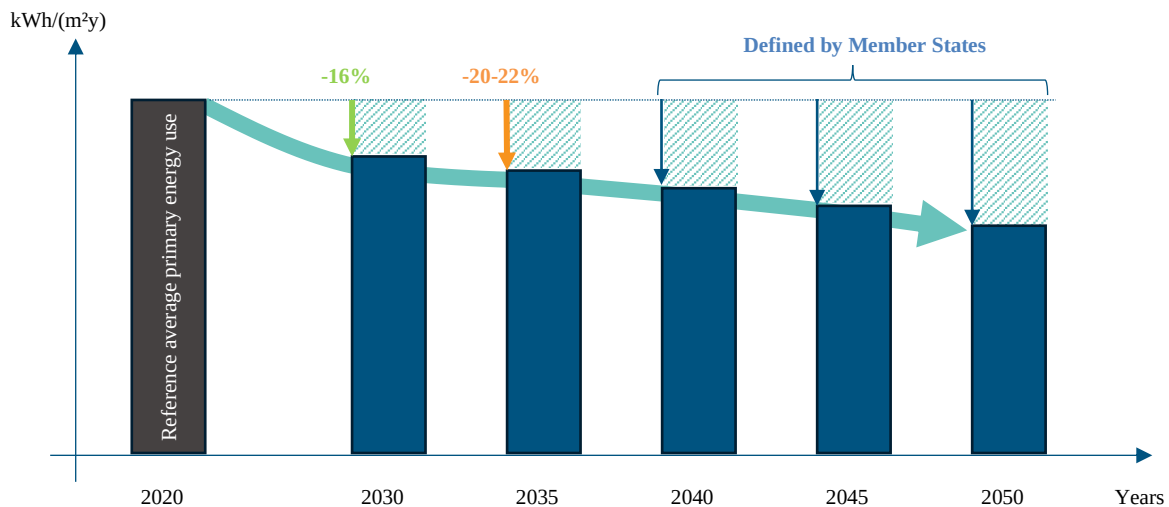


Figure 14. Overview of the trajectory and milestones for the progressive renovation of the residential building stock

In addition to average primary energy use, Member States may draw up additional indicators of non-renewable and renewable primary energy use and of operational greenhouse gas (GHG) emissions produced in kgCO₂eq/(m²y) in accordance with Article 9(3). Using these additional indicators can improve how the decarbonisation of the energy supply for buildings and the greenhouse gas emissions of the residential building stock are monitored, aligning the trajectory with national emissions targets and existing heating and cooling plans. If Member States choose to include these complementary indicators in their approach, milestones for these indicators should be set for the same years as the main trajectory (2030, 2035, 2040, etc.), as illustrated in Figure 15.

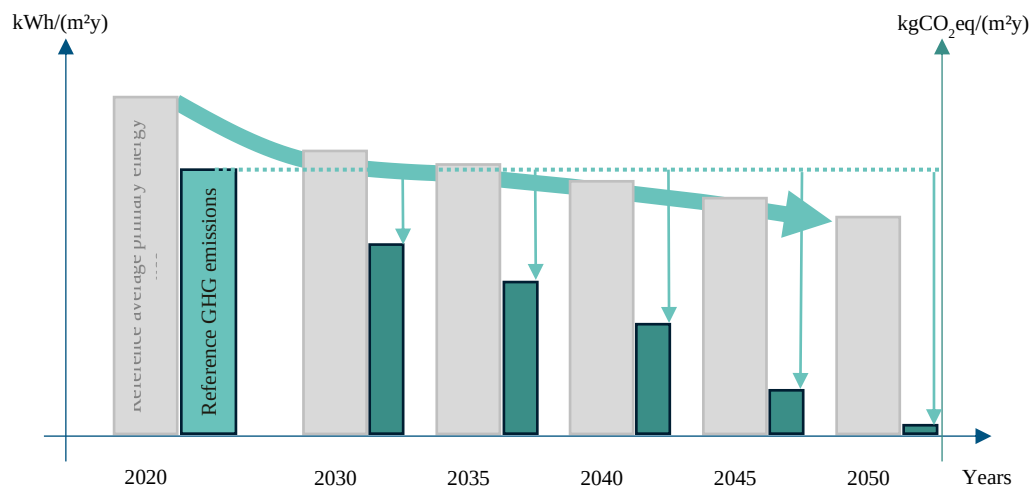


Figure 15. Illustration of complementary indicator of GHG emissions for the residential building stock

3.3.2.1. Average primary energy use in 2020

Under Article 9(2), the average primary energy use of the entire residential building stock is the metric used to set the trajectory for the progressive renovation of the residential building stock. The average primary energy use of the residential stock relates to the primary energy of the building stock in (kWh/y) and its floor area (m²) as described by the equation below. It is important to recall that the exclusion and exemption from the baseline set out under Article 9(6) in relation to non-residential buildings do not apply here. The baseline should therefore include all residential stock buildings.

$$\text{Average PEU} = \frac{\text{Total primary energy}}{\text{Total A}}$$

- Total primary energy: Primary energy use of the residential building stock in kWh/(y)
- Total A: total building floor area of the residential building stock, m²

The required data for calculating the average primary energy use of the residential building stock can be obtained through different approaches. As described in STEP 1 on classifying the building stock, Member States may use a combination of data on individual buildings such as EPCs, censuses, results from energy audits, energy metering data, surveys and ad hoc data collections and aggregated data derived from energy statistics or data collections. The choice of the approach depends greatly on data availability.

A combination of different data sources is recommended to ensure that all buildings segments are represented and all end uses are considered. It is recommended that the method Member States use to calculate average primary energy use is in line with the energy performance of buildings described in Annex I to the EPBD. To this end, when measured data is used, Member States should ensure that these are corrected for climate and behaviour, and aligned with the energy performance described in Annex I (e.g. energy used for cooking should be excluded).

If the characterisation of the building stock enables the individual primary energy use and floor area of each residential building to be determined, the total primary energy use of the residential building stock could be calculated as per the equation below.

$$Total\ primary\ energy = \sum (PEU_i * A_i)$$

- PEU: Primary energy use in kWh/(m²y)
- A: building floor area, m²
- i: from 1 to N (total number of residential buildings)

Another possible approach to calculating the total primary energy use is to use aggregated data on the final energy use of the residential building stock (e.g. from Eurostat) combined with national primary energy factors to obtain the total primary energy of the residential building stock in (kWh/y) as below.

$$Total\ primary\ energy = \sum (E_i * PEF_i)$$

- E: Final energy by energy carrier in (kWh/y)
- PEF: Primary energy factor by energy carrier

Once the total primary energy use of the residential building stock is calculated, the average primary energy use can be obtained by dividing the total primary energy use by the total floor area of the residential building stock or by the number of buildings.

Member States must describe the data sources and methodology they use in their NBRPs . The methodology should be consistent throughout the implementation and reporting periods to ensure that the trajectory and the reporting on the results are consistent. Any adjustment to the methodology applied over time should be described in detail in the plans.

3.3.2.2. Milestones and sub-targets

The provisions under Article 9(2) related to the national trajectory for the progressive renovation of the residential building stock can be divided into two requirements:

- 1) reaching the overall milestones to lower the average primary energy use by the deadlines (e.g. 16% by 2030); and
- 2) reaching the sub-target to achieve at least 55% of this reduction (e.g. 55% of the 16% reduction by 2030) through renovation of the 43% worst-performing buildings, specifying the number of buildings or floor area to be renovated.

While the decrease in the average primary energy use refers to the entire residential building stock, the sub-target to be achieved among the 43% worst-performing buildings needs to be achieved specifically through renovation works.

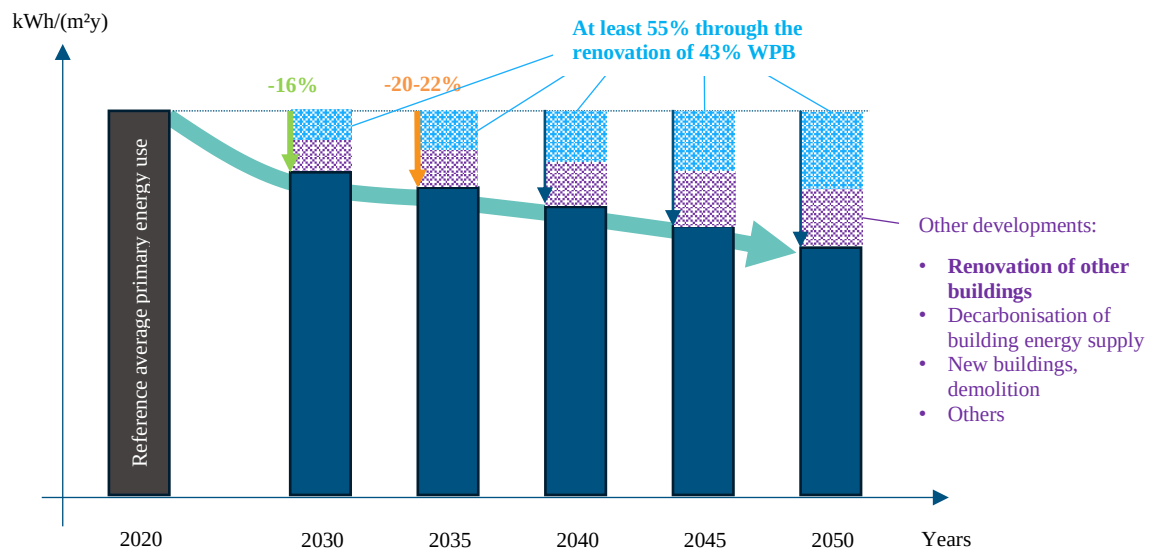


Figure 16. Trajectory to achieve a progressive renovation of the residential building stock

The total floor area of the residential building stock will change due to demolitions and new buildings built after the reference year, 2020. Demolitions after 2020 will remove floor area from the building stock, while new buildings will add new floor area. The building floor area removed and added will reduce and increase the primary energy use in different proportions. These changes in floor area and primary energy use will influence the average primary energy use of the entire residential building stock.

However, the demolition of buildings and the construction of new buildings cannot be considered as renovation measures, while the 55% sub-target must explicitly be ‘achieved through the renovation’ of the 43% worst-performing residential buildings’. Therefore, the effects of demolitions of worst-performing buildings on the average primary energy use cannot be considered in the context of the 55% sub-target.

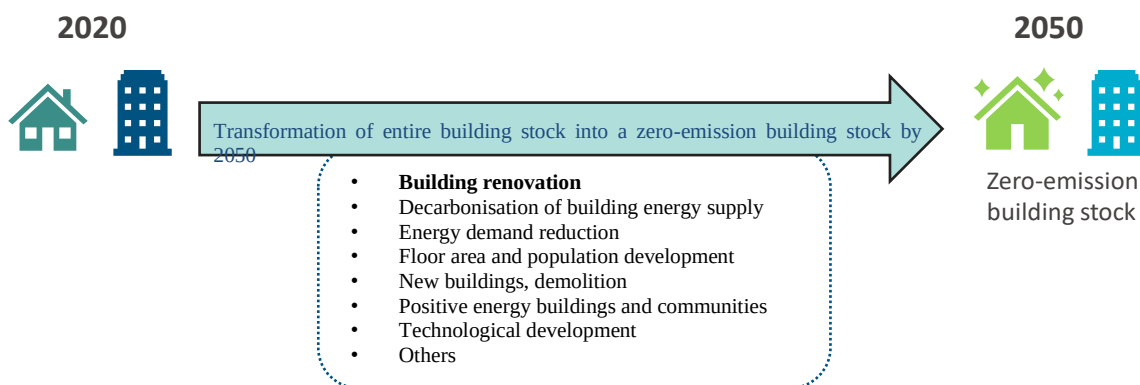


Figure 17. 2050 zero-emission building stock

The major milestones on the path to achieving a zero-emission building stock by 2050 apply to the building stock as a whole; not every single building needs to become a zero-emission building as defined in Article 11. Several factors will contribute to achieving a zero-emission building stock in the long term: the progressive renovation of buildings to enhance their energy performance will be a key factor, but a role will also be played by the overall decarbonisation of the energy supplied to buildings, especially the decarbonisation of heating systems, together with further transformation of energy systems and socio-

demographic dynamics. Member States should take into account all these factors when setting the 2050 milestone.

When setting longer-term milestones, Member States could usefully draw on national projections or the scenarios developed for their national decarbonisation strategies, national energy and climate plans (NECPs), for the achievement of renewable energy and energy efficiency targets, as well as nationally determined contributions. The assumptions for the trajectory for the progressive renovation of the residential building stock should be consistent with the underlying assumptions of the NECP scenarios, especially the assumptions related to the energy mix (e.g. primary energy factors). This would ensure consistency across national strategies.

According to the final paragraph of Article 9(2), Member States may adjust the milestones for 2030 and 2035 if the average fossil share of energy use in residential buildings is lower than 15% to ensure that the average primary energy use of the entire residential building stock by 2030, and every five years thereafter, is equivalent to, or lower than a nationally determined value derived from a linear decrease in the average primary energy use from 2020 to 2050, in line with the transformation of the residential building stock into a zero-emission building stock.

3.3.2.3. Eligible measures for reducing the average primary energy use of the residential building stock

As explained above, the eligible measures will be different for the two sub-targets contributing to the achievement of each milestone. The 45% sub-target can be achieved through building renovation measures and changes in the energy performance of the building stock due to new buildings and demolition. The 55% sub-target can only be achieved through renovation works reducing the average primary energy use of the 43% worst-performing buildings. Behavioural measures do not count towards either sub-target.

An increase in the share of renewable energy in power generation will have an impact on the primary energy use of a building and is therefore to be considered as an improvement of the energy performance of the building stock for the overall targets as per Article 9(2). If adjustments to primary energy factors or weighting factors for energy carriers result in improved calculated energy performance, Member States must explain these changes to the Commission and demonstrate that they accurately reflect a real shift in the energy mix. The choices made and data sources are to be reported using the EN 17423 format or any superseding document. It is also expected that the documented primary energy factors for 2030 will be aligned with those used in the national climate and energy plans.

The measures to achieve the 55% sub-target (reduction of at least 55% in average primary energy use must come from renovating the 43% worst-performing residential buildings) should therefore focus on renovations improving the energy performance in line with the energy performance calculations set out in Annex I of the EPBD (see STEP 3). This includes renovation of the building envelope and changes in technical building systems including the technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site generated renewable energy, or combinations thereof.

Under the fifth subparagraph of Article 9(2), Member States' renovation efforts to achieve the sub-targets must not disproportionately exempt rental residential buildings or building units.

If a reduction in primary energy consumption is achieved through the renovation of buildings affected by natural disasters, these savings can be counted towards the targets involving the 43% worst-performing buildings. Member States are recommended to monitor the number of buildings or the floor area of renovated buildings that were affected by natural disaster, and the reduction in primary energy use due to their renovation and to report on it in their NBRPs (Article 3).

The two previous sections form the starting point for setting the target path and the milestones to be achieved to reduce the average primary energy consumption of the residential building stock in the specified years. Under Article 9(2) and as part of the assessment of the NBRPs , the Commission must monitor the decrease in average primary energy use including the number of buildings and building units or floor area of the 43% worst-performing residential buildings and make recommendations if necessary. Therefore, it is recommended that Member States’ NBRPs report the effect of the various measures implemented to reduce the average primary energy use of the residential building stock.

3.3.2.4. Reporting requirements on the trajectory

Under Articles 3 and 9(2), Member States’ NBRPs must include the methodology as well as the data they use to set the trajectory, estimate the milestone values, determine the 43% worst-performing residential buildings, and also the number of buildings and building units or floor area to be renovated annually.

Figure 6 illustrates the main items to be reported as part of the national trajectories.

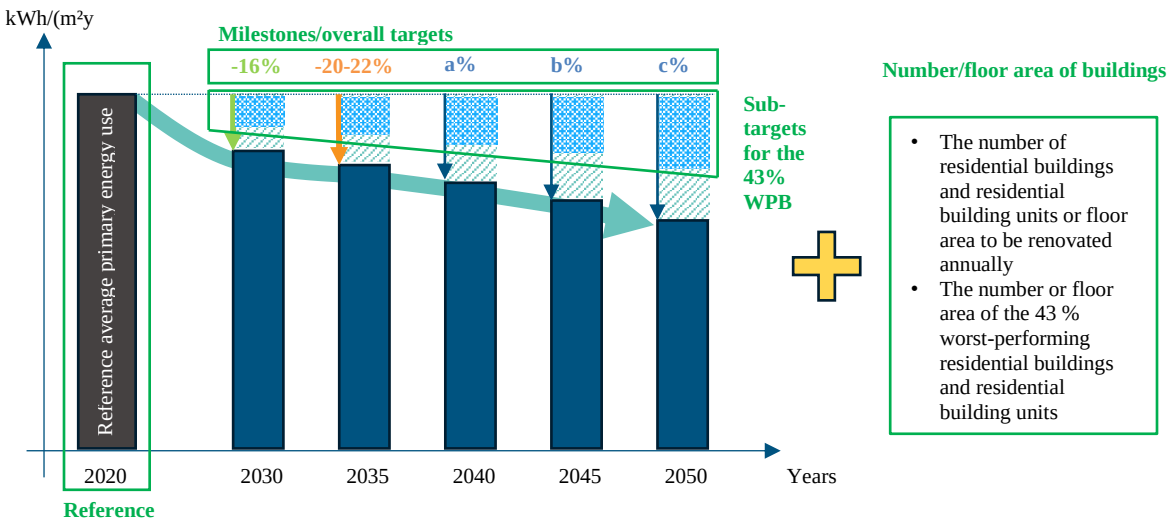


Figure 18. Reporting the trajectory of the progressive renovation of the residential building stock

3.3.2.5. Estimating the number or floor area of buildings to be renovated to achieve the decrease in the average primary energy use

Estimating the number (or floor area) of buildings to be renovated depends on a number of variables such as the physical characteristics of the portions of the building stock targeted, their characteristics (use, ownership, occupancy, etc.), and the policies in place or to be in place for renovating these buildings.

Multiple considerations apply to the number (or floor area) of buildings to be renovated from the 43% worst-performing buildings to achieve the sub-target, as described in STEP 3.

For the number (or floor area) of other buildings to be renovated to contribute to the overall target, Member States should consider what renovation works contribute to the remaining portion of the target. This is closely related to the assumptions made for the trajectory in terms of other factors such as decarbonisation of the building energy supply and the changes in the energy performance of the building stock due to new buildings and demolition, etc. (see Section 2.3.2.2). Member States must, therefore, estimate the number (or floor area) of buildings to be renovated for the remaining portion of the overall milestones in line with the assumptions and estimations made in their analyses for upgrading the building stock into a zero-emission building stock by 2050.

3.3.3. *STEP 3: Setting the sub-target to achieve at least 55% of the decrease in the average primary energy use by renovating the 43% worst-performing buildings*

3.3.3.1. Setting the threshold for the 43% worst-performing buildings

To identify the 43% of worst-performing buildings, it is recommended to rank the residential buildings in the 2020 stock based on their energy performance, measured by primary energy use (kWh/(m²y)). A threshold can then be set to identify the bottom 43% of the residential building stock. This threshold can be calculated using either the number of buildings or the total floor area. The buildings can be ranked either by creating a frequency distribution or by analysing individual data points. For a frequency distribution, the range of primary energy use (e.g. 0-500 kWh/(m²y)) is divided into specific intervals or classes. Each class represents a defined range (e.g. class 1 for 0-19 kWh/(m²y), class 2 for 20-39 kWh/(m²y), etc.). Buildings are then assigned to these classes based on their primary energy use, and the frequency of buildings or floor area within each class is calculated.

If the threshold is calculated by the number of buildings, the worst-performing buildings are counted, starting with the building with the poorest energy performance, until 43% of the total number of buildings is reached, as shown in Figure 19 (fictional residential building stock with 25 buildings). The energy performance in primary energy use (kWh/(m²y)) of the building immediately following the 43% mark sets the threshold of the 43% worst-performing buildings. All residential buildings with an energy performance that is worse than this threshold will be part of the 43% worst-performing buildings.

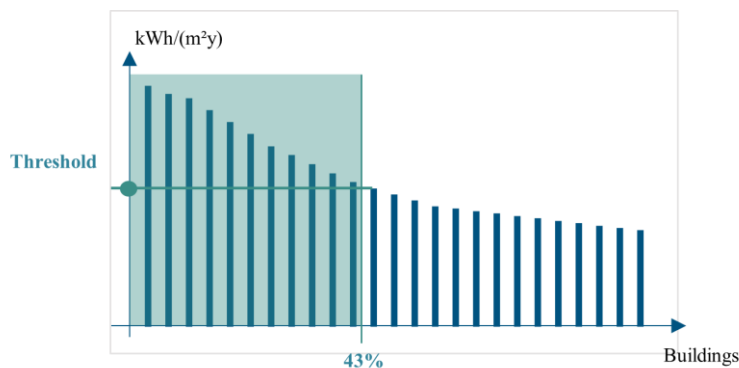


Figure 19. 43% worst-performing buildings from the residential building stock

If the threshold is set based on building floor area, the approach mirrors the method used for the number of buildings. Starting with the worst-performing building, the floor area is ranked until it reaches 43% of the total. The primary energy use of the next building, after surpassing the 43% floor area, defines the threshold in (kWh/(m²y)) for the 43% worst-performing buildings.

Selecting either the number of buildings or the floor area may result in identifying different portions of the residential building stock, either smaller or larger. When using floor area to identify the 43% worst-performing buildings, building size is taken into account, but using the number of buildings may lead to small buildings (which may have a limited potential for renovation) to be overrepresented. Member States are advised to assess data availability and the characteristics of their residential building stock, such as the breakdown by single-family and multi-family buildings (by number or floor area) and the average size of buildings in each group. This information should be used to determine a suitable approach to identifying the set of 43% worst-performing buildings (based on number of buildings or floor area) with the largest potential for energy savings and renovation.

When drafting a new NBRP (after the first plan, which is due in draft by 31 December 2025 and in its final version by 31 December 2026), the composition of buildings in the 43% worst-performing category may change due to improvements in the building stock resulting from renovations triggered by Article 9(2). It is therefore recommended that Member States adjust the ranking to reflect the updated composition of the 43% worst-performing residential buildings.

The following calculation can be used to estimate the contribution to each milestone required from the renovation of the 43% worst-performing buildings:

$$WPB \text{ Sub} - target = 55\% * Milestone \text{ decrease}(\%) * \left(Average \text{ } PEU_{2020} * \sum A_i \right)$$

- WPB Sub-target: decrease in the average primary energy use to be achieved through the renovation of 43% worst-performing residential buildings, in kWh/y
- PEU_{2020} : Primary energy use in kWh/(m²y) in 2020
- A: building floor area in m²
- i: from 1 to N (total number of residential buildings)

3.3.3.2. Estimating the number or floor area of buildings to achieve each sub-target

According to Article 9(2), Member States must identify the number or floor area of residential buildings and residential building units to be renovated annually, including from the 43% worst-performing buildings.

A number of different variables can significantly affect the estimate of this figure. For instance, assumptions about the energy performance of buildings before renovation (e.g. 150 kWh/(m²y) versus 500 kWh/(m²y)), as well as the extent (or depth) of the renovations, can result in widely varying estimates of the number or floor area of buildings that would need to be renovated to meet the sub-target. In a simplified approach, changing the intended depth of renovation from 30% to 60% will halve the estimated number of buildings that need to be renovated.

It is recommended, therefore, that Member States consider multiple factors related to the physical characteristics of buildings, other specific attributes (e.g. occupancy and ownership structures), and the expected impact of the policy measures (and required resources) envisaged to stimulate the renovation of residential buildings.

Additional objectives, such as not disproportionately exempting rental residential buildings or building units in the renovation plan under Article 9(2), or the protection of vulnerable households may also influence the categorisation of buildings. It may be useful, in order to

better target the policy measures, to differentiate vulnerable households within the group of owner-occupied buildings. This reflects the intent of the provisions in Article 17(18), which require, as a priority, that the financial incentives created by Member States target vulnerable households, people affected by energy poverty, and people living in social housing, in accordance with Article 24 of Directive (EU) 2023/1791.

It is recommended that Member States conduct a detailed study of the characteristics of the 43% worst-performing buildings, along with additional specific factors, while concurrently developing policies and measures to encourage the planned renovations. Analysing these aspects and how they are linked can produce a more comprehensive and accurate estimate of the number or floor area of buildings that need to be renovated to achieve the sub-target.

3.3.4. STEP 4: Adopt policy measures to reduce the average primary energy use

Member States have the discretion to select policy instruments to meet the Article 9(2) requirements and to implement renovation measures to achieve the required decrease in average primary energy consumption. Article 9(2) explicitly mentions minimum energy performance standards (MEPS), technical assistance and financial support measures as examples of possible policy instruments and measures. Figure 8 provides an overview of these measures.

Policy measures	MEPS for residential buildings	Financial support	Technical assistance	Other policies
	→ Define share of the target and calculate threshold → Establish architecture, responsible authorities & compliance mechanism → Enabling framework → Monitoring & enforcement	→ Support to renovate worst-performing buildings → Support for vulnerable groups → Performance-based support schemes and deep renovation	→ Target-specific One-stop-shops → Renovation passports	→ Energy efficiency obligation schemes (Art.9 EU/2023/955) → Alternative measures under Art.10 EU/2023/955 → others

Figure 20. Policy measures to achieve the required decrease in average primary energy use

According to Article 9(2), Member States are not to disproportionately exempt rental residential buildings or building units from renovation work. They should therefore ensure the fair distribution of renovation works and benefits between rental and owner-occupied buildings. The policy mix, including measures such as MEPS, financial support, and technical assistance should be designed to meet the specific needs of both segments and provide mechanisms to ensure a fair distribution of benefits. If the main policy measure does not explicitly tackle split-incentives, additional measures should be implemented to overcome any remaining barriers.

The following sections present examples of policy measures that can be implemented by Member States to achieve the required reductions in the average primary energy use of the residential building stock while also ensuring that benefits are distributed fairly.

3.3.4.1. MEPS for residential buildings

Member States may use the MEPS scheme to trigger the renovation of residential buildings and comply with Article 9(2). According to Article 2(4), ‘minimum energy performance standards’ are the rules that require existing buildings to meet an energy performance requirement as part of a broad renovation plan for a building stock or at a trigger point on the market. Trigger points include sale, rent, donation or change of purpose in the cadastre or land registry, set time periods or by a specific date, all points that trigger the renovation

of existing buildings. It is for the Member States to choose the design options and scope of any MEPS scheme for the residential building stock.

Several EU countries have already used the MEPS scheme for the residential building stock as have other non-EU regions, in different contexts and with different characteristics¹¹. If Member States also aim to implement MEPS for residential buildings, they need to set the share of the target they want to achieve through this policy instrument and the subset of the buildings that will be covered by the MEPS scheme (e.g. all worst-performing or only the very worst-performing buildings (EPC class G, or classes F and G)). Member States may also opt to implement MEPS for a specific sub-segment of the residential building stock, such as rented properties or rented multi-family buildings in a particular age category. Separate schemes for structurally weak regions within Member States can be used to improve the fair distribution of renovation work and their benefits. Generally, the suitability of policy instruments for different segments of the residential stock will increase in proportion to the thoroughness with which the building stock and its segments have been analysed in STEP 3. Based on these decisions, Member States can set a threshold within the chosen segment for those worst-performing buildings that must comply with the MEPS requirement by a certain date. A similar approach to the steps for non-residential buildings can be taken to set thresholds and identify the residential buildings to comply with MEPS. Any regulatory measures, such as a MEPS scheme, should be supported by an enabling framework to ensure effective implementation and a fair distribution of the costs and benefits. In principle, the features of an enabling framework for MEPS in non-residential buildings can also be applied to residential buildings, since specific measures are needed to address and protect tenants and vulnerable groups in both building segments.

Financial incentives and technical assistance are central to any enabling framework and are essential for the implementation of provisions related to the residential building stock. These aspects are discussed individually in the following sections.

3.3.4.2. Financial support¹²

Most EU Member States have adopted financial support schemes to encourage building renovations. A wide range of literature highlights the approaches taken, innovative strategies, and best practices in this area¹³.

¹¹ For a detailed summary on previous and existing practices see [Minimum Energy Performance Standards \(MEPS\) in the Residential Sector](#).

¹² Where applicable, financial support must comply with State aid rules. For energy efficiency in buildings, see in particular Article 38a of Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, OJ L 187, 26.6.2014, p. 1, and Section 4.2 of the Communication from the Commission – Guidelines on State aid for climate, environmental protection and energy 2020, OJ C 80, 18.2.2022, p.1.

Please see also guiding template ‘Renovate’ available here: [RRF guiding templates - European Commission](#).

¹³ <https://op.europa.eu/en/publication-detail/-/publication/a3032517-c761-11ec-b6f4-01aa75ed71a1/language-en>; <https://ibroad2epc.eu/portfolio-items/enhancing-incentives-through-ibroad2epc/>; <https://www.bpie.eu/wp->

Financial support should incentivise early action by encouraging building owners to complete renovations ahead of the milestones outlined in the set trajectory.

Given that Article 9(2) requires a sub-target for renovating the worst-performing buildings, and recognising the strong connection between Article 9 and Article 17 of the Directive, the following sections focus on financing strategies aimed at: (a) the worst-performing buildings, (b) vulnerable groups, and (c) performance-based mechanisms.

3.3.4.3. Financial support for renovating worst-performing buildings

Financial support can be granted to support the renovation of worst-performing buildings. The type of public support may vary. For example, it can take the form of low-interest or interest-free loans, a repayment bonus that reduces the amount of interest to be repaid and thus shortens the loan term, or tax relief. The level of support may also vary and may be designed as a bonus on top of existing support programmes or to fully finance the renovation of selected worst-performing buildings owned by energy-poor households.

To qualify for support, building owners should provide evidence that their property is among the 43% worst-performing buildings. The simplest way to verify this is by presenting a valid energy performance certificate (EPC). Member States are free to set other eligibility criteria. Examples include focusing on buildings constructed in certain years or periods, alongside additional factors such as unrenovated building envelopes (or sections of them), the age of fossil-fuel heating systems, or recent metered energy consumption data.

3.3.4.4. Financial support for vulnerable groups to renovate buildings

There is an overlap between the worst-performing buildings and buildings inhabited by vulnerable households, including households in energy poverty. To provide direct financial support to those in need and also renovate the worst-performing buildings, support schemes can be designed especially for this target group.

In practice, those support schemes often cover a high share of the costs. See, for example, Ireland's Better Energy Warmer Homes scheme, Slovenia's ZERO500 programme, the Scottish government's considerable support provided under the Social Housing Net Zero Heat Fund to ensure Scotland's Energy Efficiency Standard for Social Housing was met and the Basque one-stop-shop *Opengela*, providing loans to cover up to 100% of renovation costs. In general, the lower the income level of the vulnerable household, the higher the support should be.

The Social Climate Fund¹⁴, which was set up alongside the Emissions Trading System for fuel combustion in buildings, road transport and additional sectors (ETS 2), provides Member States with a facility to design support measures for the direct benefit of

¹⁴ [content/uploads/2021/03/OurBuildings-Long-term-renovation-strategies-report_final.pdf](https://energy.ec.europa.eu/system/files/2022-12/SWD-Analysis-of-2020-LTRS.PDF);
<https://energy.ec.europa.eu/system/files/2022-12/SWD-Analysis-of-2020-LTRS.PDF>.
https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/social-climate-fund_en#:~:text=Social%20Climate%20Fund.%20Video%20explainer:%20the%20EU%20Emission

vulnerable groups. It is specifically designed to channel investment into the renovation of buildings occupied by these groups, besides other measures and investments in the building and transport sectors. The worst-performing buildings and vulnerable households are often distributed differently across different regions of the Member States. Public authorities at national and regional level should ensure that there is sufficient support available to vulnerable households to renovate their buildings, whether or not related to MEPS. Central authorities should provide higher levels of support to regions with a higher share of worst-performing buildings and vulnerable households. Technical support from central contact points (one-stop shops) can play a crucial role in ensuring a fair distribution of the financial support available.

Further clarification on support to vulnerable households is provided in the guidance on Article 17 (Annex 2).

In addition, a dedicated financing scheme could be created to fund the renovation of worst-performing social housing buildings, whether or not linked to MEPS. This is particularly useful if social housing buildings in the Member State have a lower energy performance compared to other buildings in which vulnerable households live.

3.3.4.5. Performance-based support schemes

Financial support alone does not inherently guarantee that energy performance improvements are carried out. For this reason, Article 17(14) requires Member States to link their financial measures to the targeted or achieved energy performance improvements specified by one or several criteria, listed in the paragraph. This can be achieved by designing schemes that, for example, are tied to the measures laid down in a renovation passport, or schemes that incorporate a plausibility check through metering energy use before and after the works. Additionally, running tenders for energy savings could produce favourable cost-benefit renovation solutions if projects that commit to the highest savings at the lowest cost qualify for extra support. These schemes would require at least minimal post-intervention monitoring.

In line with Article 9(4)(c), priority should be given to deep, performance-driven renovations that offer enhanced support for upgrades resulting in future-proof buildings, such as the upgrades specified in a renovation passport. This approach helps prevent lock-in effects and ensures long-term energy efficiency and sustainability.

To partly tackle the issue of split-incentives, performance-based modernisation fees could balance rent increases from renovations by capping them while ensuring that tenants benefit from the improvements. At the same time, these fees would provide property owners with a stable source of income for refinancing the renovation costs (see e.g. the energy performance allowance known as EPV¹⁵ in the Netherlands). Another way to tackle split-incentives is to allocate CO₂-pricing costs between tenants and landlords based on the energy performance of the building (as in Germany). This approach encourages both parties to invest in energy efficiency improvements.

¹⁵ <https://www.rvo.nl/onderwerpen/energieprestatievergoeding>.

3.3.4.6. Technical assistance

Article 18 requires Member States to create and widely implement one-stop shops to assist building owners in improving the energy performance of their buildings.

The guidance on Articles 21, 22 and 24 of the Energy Efficiency Directive¹⁶ provides clarifications on the set-up and role of these one-stop shops, in particular under Section 5.3. ‘OSS for the provision of technical, administrative, and financial advice for energy efficiency – Article 22(4), (5) and (6)’ and Section 6.5. ‘Foster technical assistance and roll-out of enabling funding and financial tools – Article 24(3)(d)’.

In addition, the Commission will publish guidelines to develop those one-stop shops addressing key policy considerations for public authorities, as per Article 22(6) of the EED and Article 18(1) of the EPBD.

The paragraphs below highlight only some specific aspects relevant to implementation of Article 9(2).

To effectively implement policy measures like MEPS schemes and ensure that financial aid is directed to the buildings occupied by vulnerable groups, one-stop shops should focus on providing targeted support. These centres should offer specialised assistance to meet the unique needs of these specific groups, ensuring equitable access to resources and guidance.

To be effective and ease access for different societal groups, one-stop shops should also be set up as physical advisory centres, rather than solely operating online.

One-stop shops play a key role in supporting policy measures deployed as part of the renovation efforts. For instance, if hard-to-reach segments such as co-owned large apartment blocks are covered by MEPS schemes, building owners will need to accelerate and streamline decisions on renovations. Providing expert advice and appointing a central coordinator would be particularly helpful in assisting such a procedure.

Similarly, one-stop shops could be dedicated to assisting vulnerable households and direct them to financial support for the renovation activities.

Renovation passports are a tailored roadmap for the deep renovation of buildings following a set number of steps. They are another key tool to provide advisory and technical assistance to residential buildings owners. The EPBD brings in a common framework for renovation passports in Article 12 and Annex VIII and further provisions to promote their use. For more details on renovation passports please see the dedicated guidance in Annex 4.

3.3.4.7. Monitoring impact

In accordance with Articles 3(5) and 9(2), the Commission will assess NBRPs, explicitly considering the reduction targets for average primary energy use in 2030, 2035, 2040, 2045 and 2050. The Commission will also evaluate whether the target share has been achieved in

¹⁶ Commission Recommendation (EU) 2024/2481 setting out guidelines for the interpretation of Articles 21, 22 and 24 as regards the consumer-related provisions of Directive (EU) 2023/1791. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202402481.

the 43% of residential buildings with the worst energy performance. The assessment of the first NBRP will feed into the review of the Directive, which the Commission is required to conduct by 31 January 2028 pursuant to Article 28. According to Article 28, if the assessment of the Directive and related legislation indicates that the policies and measures reported in the plans are unlikely to achieve the targets, including those under Article 9(2) for the residential building stock, the Commission will consider proposing mandatory minimum energy performance standards across the entire building stock.

To monitor the impact of policy measures on progress on the trajectory for the progressive renovation of the residential building stock, it is essential to track several additional aspects: the number of buildings renovated and the energy improvement delivered by renovation, the social impacts of implemented MEPS, and other key variables such as renovation rates, the scope and depth of renovations and the building energy supply mix.

Member States must ensure that energy performance improvements in individual buildings are not counted more than once. Improvements should be clearly attributed to a specific policy instrument. If a renovation is driven by multiple policy instruments, the energy performance improvements should be attributed to each instrument proportionally.

Monitoring progress along the trajectory could be aided by drawing on data in national databases for the energy performance of buildings referred to in Article 22. The data aggregated in the database developed by each Member State can help to monitor the overall reduction in average primary energy use across the residential building stock.

A bottom-up approach is recommended, e.g. by using EPC registers or self-reporting systems, to monitor target achievement in the worst-performing-building segment. Regularly updated or new EPCs issued after a major renovation under Article 20 can be an important tool to monitor progress in energy performance in certain segments of the building stock, especially the worst-performing buildings.

To better use policy feedback for future policymaking, annually monitoring the impact of individual measures from the policy mix implemented under Article 9(2) is highly recommended. It can subsequently be used for the purpose of wider reporting obligations, e.g. under Regulation (EU) 2018/1999 (the Governance Regulation) and may be designed to be compliant with Article 10(2) of Directive (EU) 2023/1791.

If MEPS are used as part of the policy mix for the progressive renovation of the residential building stock, Member States must bring in a monitoring mechanism to evaluate the impact of MEPS according to Article 9(7). Apart from monitoring target achievements, Member States must monitor social impacts, in particular on the most vulnerable groups, following Article 9(4e). This can include monitoring the reduction in energy expenses for households, especially low-income households (alongside monitoring the energy poverty rate), the percentage of vulnerable or low-income households benefiting from renovation and conducting social cost-benefit analyses of a set of reference renovation projects.