



Making the EPBD more effective for deep renovation: EU policy recommendations

QualDeEPC H2020 project

- Summary -

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Accelerating Deep Energy Renovation“

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SUMMARY

The original objectives for introducing Energy Performance Certificates (EPCs) were 1) to make energy performance transparent in the building market, as a measure of energy costs of using a building that a potential buyer or tenant would be interested in; and 2) to encourage energy efficiency renovation. However, the current implementation of EPC schemes in the Member States still shows significant challenges in achieving these two objectives. The recast of the EU Directive on the Overall Energy Performance of Buildings (EPBD) provides a chance to enhance both the usefulness and quality of EPCs and the EPC schemes overall.

This document aims to inform the debate on the recast of the EPBD. It summarizes the **policy recommendations of the Horizon 2020 QualDeEPC project for making the EPBD more effective for deep renovation**. The policy recommendations particularly target the link between EPCs and deep (energy) renovation¹, while increasing the levels of ambition and convergence across the EU in terms of building renovation. The policy recommendations are agreed upon between the QualDeEPC partners and have been discussed with stakeholders, i.a., in national workshops and the project’s final conference.

Combined with supporting tools developed by the QualDeEPC consortium, the policy recommendations are formulated to take into account the European Commission’s proposal for a recast of the EPBD of 15 December 2021, COM (2021) 802 final; they look particularly at the articles relevant to EPCs.

Of the following 10 policy recommendations, the first, third, and fourth may be the most important to improve the user-friendliness of EPCs and their link to deep (energy) renovation. No. 1 is based on an enhanced EPC form template developed by QualDeEPC. The next four are closely related to deep (energy) renovation – no. 3 is also one of seven development priorities of QualDeEPC, the others concern 3 general topics linked to deep renovation –, while policy recommendations 6 to 10 are based on the other five priorities of QualDeEPC for the development of enhanced EPC schemes.

For each of these 10 policy recommendations, we offer a **concrete suggestion on how the content of the recast of the EPBD could be further improved**.

- 1 [Ensure high user-friendliness of the EPC template and data](#)
- 2 [Implement a clear and ambitious definition of ‘Deep \(Energy\) Renovation’](#)
- 3 [Enhance the renovation recommendations on EPCs toward deep \(energy\) renovation](#)
- 4 [Increase the coverage of the building stock with EPCs based on an energy audit or Renovation Passports](#)
- 5 [Develop a better specification of energy data and classes on EPCs by the EPBD](#)
- 6 [Provide an online tool on deep renovation options for building owners in each Member State](#)
- 7 [Create Deep Renovation Network Platforms](#)
- 8 [Require regular mandatory EPC assessor training or examination](#)
- 9 [Provide voluntary/mandatory advertising guidelines for EPCs](#)
- 10 [Improve compliance with the mandatory use of EPCs in real estate advertisements](#)

¹ In our work, we decided to speak of ‘deep *energy* renovation’, although the official documents always use the term ‘deep renovation’. It must be noted, however, that there are countries, in which ‘deep renovations’ are also defined based on the extent of renovation *overall*, i.e., the quantity and quality of work undertaken for the renovation of a building’s interior and exterior, not only for energy efficiency. In order not to create confusion, we mostly use ‘deep (*energy*) renovation’ in this text, except for concrete proposals to change the legal text in the draft EPBD recast, where we use ‘deep renovation’.



TEN POLICY RECOMMENDATIONS FROM THE QUALDEEPC PROJECT

1 Ensure high user-friendliness of the EPC template and data

EPC forms are implemented to meet the information requirements set by the EPBD. On one hand, the EPCs have to include all technical aspects to show the energy performance of a building. On the other hand, the “user” of the EPC, i.e. building owners or representatives, potential buyers and tenants, need to understand the information given on the EPC forms. Moreover, third parties such as financial advisors or real estate agents may also require specific information on the energy efficiency of a building. Hence, the EPC forms need to be highly user-friendly to successfully convey the given information to all users.

However, the level of details provided in EPCs varies between the Member States. The usefulness of the presentation of the data varies too.

In order to improve the usefulness of the EPCs, in particular for providing the information needed to stimulate deep (energy) renovation, QualDeEPC developed an **enhanced EPC form template**, with 4 pages plus optional annexes, which is shown in Annex 1. Comparing the information needs to be reflected in this form template and the proposed EPBD recast (see list of proposed indicators displayed in Annex 2), the additional information suggested in Policy Recommendation 1 will need to be included.

Policy Recommendation 1

In Art. 16, require

- **additional content** on the EPC document, **including** the content of the **proposal** on an enhanced EPC form template developed by QualDeEPC (see Annex 1 of this document) and the **list** of mandatory indicators and content for Annex V of the EPBD recommended here below,
- that the renovation recommendations be consistent with deep energy renovation in their selection and energy efficiency levels (see Policy Recommendation 3), and
- that possibilities for a stepwise implementation are indicated (enabling staged deep renovation, see Policy Recommendation 4).

Particularly, add to **Annex V** the **following mandatory indicators and content**:

- Improved classification(s), using the same scale as for the current energy class, and improved energy performance value(s) after implementing a recommended combination of renovation actions ('main option') on p. 1
- Potential energy savings (in kWh/yr) after implementing the 'main option' on p.1
- Details on building envelope and building HVAC system, illustrated by a traffic light system
- Detailed renovation recommendations by component, consistent with deep energy renovation, illustrated by the same traffic light system
- Useful combination of renovations and stepwise implementation – indicating possibilities for staged deep renovation
- Link to an official online platform for further information, such as a Deep Renovation Network Platform (see Policy Recommendation 7).



2 Implement a clear and ambitious definition of ‘Deep (Energy) Renovation’

The Commission’s proposal for the Recast of the EPBD – COM (2021) 802 final – includes the following definition in Art. 2:

“19. ‘deep renovation’ means a renovation which transforms a building or building unit

(a) before 1 January 2030, into a nearly zero-energy building;

(b) as of 1 January 2030, into a zero-emission building; “

The QualDeEPC team welcomes the fact that the European Commission has included a proposal for ‘deep renovation’ in its Directive proposal. We are pleased to see that, as the approach for a definition recommended by our project (see below), it is based on the nearly zero-energy building and that it goes further in ambition to the zero-emission building in 2030. In comparison to our approach, this is simpler; this may be justified, if all EU Member States have defined nZEBs at sufficiently ambitious levels, be they for new build or renovation. Otherwise, our approach may be more appropriate.

The Commission’s proposal also includes a definition of ‘staged deep renovation’, which is based on the ‘renovation passport’ that is also defined in the draft Directive. However, the renovation passport is only proposed as a voluntary tool, and will not be operational before 2025. Therefore, we still see the need for ensuring that partial or staged renovations are in line with deep renovation and also for buildings that do not have a renovation passport. This could be done by including our approach to energy standards for deep renovation in the definition of ‘staged renovation’:

Policy Recommendation 2:

Add – here *underlined in italics* – to the definition of ‘staged deep renovation’ in **Art. 2 (20)**: ‘staged deep renovation’ means a deep renovation carried out in several steps *that each achieve energy standards for building elements equal to at least those that are usually required to achieve deep renovation, for example,* following the steps set out in a renovation passport in accordance with Article 10;

QualDeEPC’s proposed approach to defining deep renovation in detail:

Based on the analysis of existing proposals for defining ‘deep (energy) renovation’, QualDeEPC proposes a modified nZEB-based approach for **defining deep (energy) renovation**, following four staged criteria:

1. For those Member States that have defined their objective or legal nZEB definitions/ standards for existing buildings: ‘renovation achieving component energy standards equal to at least those that are usually required to meet nZEB requirements for existing buildings’.
2. For Member States that only have nZEB definitions for new build but not existing buildings, and in which the nZEB requirements for new build are not so ambitious and would be achievable through renovation: ‘renovation achieving component energy standards equal or close to those that are usually required to meet nZEB requirements for new buildings’.
3. In Member States that only have nZEB definitions for new build but not existing buildings, and in which the nZEB requirements for new build are too ambitious to reach through renovation: ‘renovation achieving component energy standards close to those that are usually required to meet nZEB requirements for new buildings, as much as is technically and economically feasible’.

4. In Member States without current availability of such improved component energy standards or with very lax nZEB definitions: adopt best practices and component improvements in deep energy renovation from the other Member States with similar climates, and where such standards exist.

3 Enhance the renovation recommendations on EPCs towards deep (energy) renovation

Currently, the renovation recommendations in EPCs in most Member States are oriented toward the minimum legal requirements and are often low-cost options. EPC assessors may often not include all energy renovation actions that may be only cost-effective in the long run, with financial incentives, or in connection to renovation works that were scheduled anyway. Based on their understanding of “cost-effective”, they may only recommend a limited set of low-cost options.

Therefore, the EPBD and the national transposition should include much clearer requirements for EPC assessors to formulate their renovation recommendations in a way consistent with deep energy renovation, as suggested in Policy Recommendation 3 here below. QualDeEPC developed a list of enhanced renovation recommendations with appropriate energy efficiency levels.

Policy Recommendation 3

In Article 16 (4) or a new paragraph in Art. 16:

Require Member States 1) to adapt the definition for ‘deep renovation’ and 2) to specify the renovation recommendations that must be provided on EPCs in the following way:

- **Specify that the energy efficiency levels to be recommended** for different types of actions must be consistent with deep renovation leading to nZEB or ZEB standards for existing buildings, including when implemented step by step in a staged deep renovation, e.g. **using the proposal for enhanced renovation recommendations and traffic light system (on the enhanced EPC template presented below) provided by QualDeEPC**
- **Clarify that in the EPC itself,**
 - 1) the EPC assessor should include all potential recommendations** needed to achieve nZEB or ZEB standards for existing buildings (i.e., deep renovation according to the proposal for the EPBD recast),
 - and 2) that the EPC assessor should clarify**
 - i) whether the recommendations are cost-effective on their own or only** with financial incentives existing at the time of issuance of the EPC, and
 - ii) whether the measures and their costs are independent of, or carried out in connection to, a major renovation of the building envelope or technical building system or systems that is scheduled anyway¹** (meaning that cost-effectiveness of renovation will always be based on *energy-related costs* only, as it is already specified in the EPBD)

3) Require Member States to develop a set of methods and data to assess co-benefits² of building renovation and require their use in assessment and in the presentation of cost-effectiveness or as direct co-benefits data (if not possible to monetise) on the EPC.

4) In Art. 22 on independent experts: Require Member States to include all of the former into the training or examination of EPC assessors³.

¹ **Note:** The EPBD in its current form and the draft recast mentions that “the recommendations shall cover” measures and their costs that are either independent of, or carried out in connection to, a major



renovation of the building envelope or technical building system or systems, but not that the recommendations should explicitly state this fact.

² **Co-Benefits** may include improved thermal comfort; health and productiveness due to less dampness, mould and other effects of renovation; alleviation of energy poverty; smart readiness; creation of jobs; improved energy security; and increased GDP. See, e.g., combi-project.eu and micat-project.eu.

³ Such training or examination should be regular and mandatory (see Policy Recommendation 8).

4 Increase the coverage of the building stock with EPCs based on an energy audit or Renovation Passports

Only buildings that get sold or rented out are currently in need to show an EPC. In addition, the EPC does not have to be based on an energy audit that will enable a comprehensive roadmap towards deep (energy) renovation.

The Commission's draft proposal for the recast of the EPBD includes a new article 10 on renovation passports. These are defined in Art. 2:

"18. 'renovation passport' means a document that provides a tailored roadmap for the renovation of a specific building in several steps that will significantly improve its energy performance;"

Article 10 then specifies and regulates the renovation passport in more detail, particularly its "objective to transform the building into a zero-emission building by 2050 at the latest". However, the renovation passport is only proposed as a voluntary tool, and will not be operational before 2025.

Both tools, EPCs and renovation passports, would therefore not cover all buildings in need of energy efficiency renovation. We, therefore, suggest the following additions to the EPBD:

Policy Recommendation 4

Add a new **Art. 10 (4)** to require Member States to ensure that all buildings, which were built before a national building energy code came into force that required at least low-energy buildings, and which are not renovated to close to an nZEB level, **have an EPC based on an energy audit or a Building Renovation Passport**, whatever is more appropriate in a Member State, **the latest by 2030**. For the worst-performing half of the building stock, this shall be achieved **by 2027**.

In Art. 10, also require the Member States to develop a set of methods and data to include co-benefits of building renovation into the cost-effectiveness calculation or presentation (if not possible to monetise) **and require their use** in assessment and on the Renovation Passport.

Furthermore, require **disclosure** of an existing renovation passport to potential buyers or tenants (Art. 10 or 19).

Add to **Art. 16 (4, 5)** that the Member States shall ensure that the EPCs shall **indicate** whether the **renovation recommendations on the EPCs** can be implemented **in staged deep renovation**, e.g., consistent with a renovation passport.

5 Develop a better specification of energy data and classes on EPCs by the EPBD

Energy data presented on EPCs vary between the Member States. They can be final, primary, non-renewable primary energy, CO₂ emissions, and sometimes the share of renewable energies. For deep energy renovation, non-renewable primary energy or CO₂ emissions are informative, but they do not distinguish between (1) the energy performance of the building envelope and the heat/cold distribution system and (2) the energy performance and emissions of the heat/cold supply systems. Total primary energy, which is the indicator proposed by the European Commission for defining the energy class, would be more appropriate to cover the energy performance of the building envelope, as long as the primary factor of electricity is not approaching 1.0 due to the increasing share of renewable energies. Once this happens, an additional indicator to measure the energy performance of the building envelope will therefore still be needed. On the supply side, it will ultimately be the operational greenhouse gas emissions that matter.

Policy Recommendation 5

Require the European Commission in the recast EPBD to **study if** EPCs should be changed in the following way:

- 1) Change the energy performance calculation from primary energy to two indicators: an indicator (1) for the energy performance of the building envelope and the heat/cold distribution system (e.g., heat/cold input demand (kWh/m²/yr) for space heating and cooling and water heating, combined with electricity demand for lighting (non-residential) and ventilation), and an indicator (2) on operational greenhouse gas emissions (kg CO₂/(m² year)), and
- 2) consequently, split the energy performance class into a new energy efficiency class based on indicator (1) and a climate class or greenhouse gas emission class based on indicator (2).

The study would include a full comparison of pros and cons using these two indicators for the energy and climate performance instead of primary energy based on weighing factors, and an assessment of how these new indicators can ensure a low building energy use in the Member States.

6 Provide an online tool on deep renovation options for building owners in each Member State

Some Member States already have tools that allow building owners or tenants to see which energy renovation actions may be useful for their building and what would be savings achievable, and often an indication of costs. These recommendations could be compared to those of an EPC, or be used to prepare a discussion with an energy consultant or EPC issuer. However, such tools are not yet available in all EU Member States, and their quality may differ. In particular, the renovation recommendations provided may not always be consistent with deep (energy) renovation. Therefore, project partners think such tools are useful but should be made consistent with deep (energy) renovation.

Policy Recommendation 6

In **Art. 26 (2)**, recommend to the Member States to **provide a high-quality energy calculation and recommendations tool for self-use**, and to ensure that it is kept updated and that **the renovation recommendations provided are consistent with deep renovation**.



Note: the Swedish stakeholders connected to the QualDeEPC project do not support this Policy Recommendation.

In the framework of the QualDeEPC project, such tools are under development/developed in participating countries. The experiences with these pilot tools should be taken into account when deciding on the development and continuation of such tools.

7 Create Deep Renovation Network Platforms

Not all Member States already provide easy access to all the information relevant for energy efficiency renovation, and practical support for implementation, and often not in one central place (one-stop-shop, online and/or in a physical office). In addition, there is the need for more active marketing of deep energy renovation and coordination of supply-side actors, including for regular training of energy consultants.

Concepts and tools provided by QualDeEPC:

Deep Renovation Network Platforms would serve as a tool for building owners and all actors in the market for deep energy renovation. They include the emerging concepts of one-stop-shops (OSS) for deep energy renovation, the task of which is to relieve the customer of research, design, or bureaucratic processes. In addition to OSS, the Deep Renovation Network Platforms would coordinate supply-side actors and support their marketing, training, and quality.

Policy Recommendation 7

Add to **Art 15 (6)** the following provision in a slightly adapted form:

“These technical assistance facilities, including one-stop-shops, shall be established in the forms of **both an online platform at the national level and a network of local or regional physical hubs**, and be endowed with **sufficient resources** to actively reach out to at least 5 % of building owners each year.”

In the framework of the QualDeEPC project, online platforms providing all necessary information are under development/developed in participating countries and may be examples for other countries.

8 Require regular mandatory EPC assessor training or examination

High-quality energy assessment and certification requires regular training of energy consultants and EPC assessors. Requirements defined by the Member States for qualifications, training, and examinations to be certified or accredited and registered as an EPC assessor differ significantly.

QualDeEPC’s research and stakeholder discussion support the conclusion that *either* there should be initial and **regular training** of EPC assessors on calculation methods, avoiding errors, dealing with new technologies and changes in legislation, issuing EPCs, explaining the functions and content of the EPC and renovation to their clients, and particularly on the deep energy renovation recommendations; *or* there should be a **regular examination** (combined with voluntary training) on these types of content.

Policy Recommendation 8

In **Art 22**, Require the Member States to **require either** an initial and **regular training or** an initial and **regular examination of EPC assessors** as the precondition to be certified or accredited and registered as an EPC assessor. Renovation recommendations consistent with deep energy renovation should be a special focus.

9 Provide voluntary/mandatory advertising guidelines for EPCs

In all EU member states, it should by now be mandatory to display the energy class of the EPC and/or the energy performance included in the EPC in selling or renting advertisements, since this is required in the EPBD. However, the compliance in the markets varies.

A potential way to improve compliance is to provide sellers, landlords and letting agencies with concrete and voluntary or even mandatory guidelines for the use and presentation of EPCs and the legally required data in advertisements for sales and rentals of buildings. This will make it easier for these target groups to comply with the advertisement requirements. Such guidelines issued by energy agencies/public authorities are already available in some Member States, e.g. Ireland and Sweden.

Policy Recommendation 9

In **Art 17 (4)**, **require the Member States to create** easy-to-use advertising guidelines, **communicate** the existence and usefulness of the guidelines widely and actively, and **consider making their use mandatory**.

10 Improve compliance with the mandatory use of EPCs in real estate advertisements

Advertising guidelines may not be sufficient to enhance compliance with the mandatory display of EPC energy data/class in real estate advertisements to high levels (close to 100%). The level of compliance with this requirement is varying between the Member States, and data available to us are inconclusive to ascertain how many countries are actively controlling and enforcing this legal requirement. The European Commission's proposal for the EPBD recast includes a new provision that the Member States shall carry out sample checks or other controls to ensure compliance with these advertisement requirements. However, we suggest that further action may be needed and should be included in the EPBD.

Policy Recommendation 10

In **Art 17 (4)**, require the Member States to

- explicitly **appoint a nodal authority** with sufficient resources and the mandate to perform the random checking and the following measure:
- **raise awareness** of the duty to display EPC energy data/class in real estate advertisements, and of the advertisement guidelines;
- define **staged penalties** for non-compliance.


Annex 1: QualDeEPC's enhanced EPC form template



EPC form *for residential buildings* in accordance with *Building Energy ACT XYZ*

Registry no.: 123456789	Valid until: DD/MM/YYYY# <small>*EPC is valid 10 years from the date of issuance</small>	EPC type: e.g. asset rating
other requirement(s), e.g. nZEB standard, calculation method		

Building data	
Type of building	e.g. multi-family home,
Address	
Additional specification of building	e.g. nine apartments;
Year of construction	
Area	
Additional value	



1

minValue [kWh/m ² yr]	maxValue [kWh/m ² yr]	Energy class	1 st value, e.g. Primary energy [kWh/m ² yr]	2 nd value, e.g. final energy [kWh/m ² yr]	"improved value" for Main Option* [kWh/m ² yr]
		A+			
		A			
		B			234
		C			
		D			
		E			
		F	987		
		G			
		H			
CO ₂ -/GHG-emissions [kg CO ₂ /(m ² yr)]:					

* The underlying renovation recommendations and implementation scheme for the Main option are given on p. 3 & 4.

Potential final energy savings for renovation according to the Main Option:	XYZ kWh/yr
Potential savings of CO ₂ -/ GHG-emissions according to the Main Option:	ABC kg CO ₂ / yr

Issuer e.g. address, telephone no., registry no.	Date Signature
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EPC form *for residential buildings*

in accordance with *Building Energy ACT XZY*

Details on the current energy performance of the building

Energy consumption**		measured:			modelled***:		
No.	Period of measurement (from – to)	Energy source	Energy consumption for space-heating and domestic hot water (DHW) [kWh/yr]			Electricity [kWh/yr]	Other: _____
			Total	Heating	DHW		
1							
2							
3							

2




**measured energy consumption depends on the use of heating, cooling, ventilation system (inkl. windows) and domestic hot water system of building occupants, as well as the number of occupants. Also, the weather conditions during the period of measurement;
 ***modelled energy consumption may differ from actual use

Assessment of building envelope and technical system

Building envelope	Area [m ²]	Description or Avg. U-value [W/m ² K]	Energy rating ^{##}
Roof or ceiling to attic			
External walls			
Windows			
Doors/Gates			
Ground floor or floor to unheated basement			

Technical systems	Year of construction/ installation	Energy source, provided power, EU energy label	Energy rating ^{##}
Heating system			
Domestic hot water			
Ventilation system			
Cooling system			
Renewable energies			
Lighting			

^{##} Meaning of energy rating:

-  Exceeds significantly the minimum standards of Building Energy Act (e.g. as suggested by funding programs)
-  Reaches or minimally exceeds the minimum standards of Building Energy Act (e.g. current regulations/ laws)
-  Lower than standards of Building Energy Act




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EPC form *for residential buildings*

in accordance with *Building Energy ACT XYZ*

Renovation recommendations – component evaluation

Building envelope	Recommendation	"new" avg. U-value [W/m ² K]	New Energy rating [#]	Cost effectiveness (e.g. pay-back time)	Included in Main option?
Roof or attic					<input type="checkbox"/>
External walls					<input type="checkbox"/>
Windows					<input type="checkbox"/>
Doors/Gates					<input type="checkbox"/>
Ground floor or floor to unheated basement					<input type="checkbox"/>

3

Technical systems	Recommendation	Energy source, provided power, EU energy label	New Energy rating [#]	Cost effectiveness (e.g. pay-back time)	Included in Main option?
Heating system					<input type="checkbox"/>
Domestic hot water					<input type="checkbox"/>
Ventilation system					<input type="checkbox"/>
Cooling system					<input type="checkbox"/>
Renewable energies (outside of other systems)					<input type="checkbox"/>
<i>Other: e.g. Lighting</i>					<input type="checkbox"/>

Potential final energy savings for renovation according to the Main Option: XYZ kWh/yr

Potential savings of CO₂-/ GHG-emissions according to the Main Option: ABC kg CO₂/ yr



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EPC form *for residential buildings*

in accordance with *Building Energy ACT XZY*

Renovation recommendations – renovation concepts

Description of useful combination of renovations and stepwise implementation for the Main option:

4

Economic result (e.g. payback time, *optional*):

Main option meets requirements for:

<i>Nearly zero energy buildings in case of renovation:</i>	<input type="checkbox"/>
<i>Air tightness:</i>	<input type="checkbox"/>
<i>Reduced thermal bridging:</i>	<input type="checkbox"/>
<i>Min. 50% RES or equivalent measures:</i>	<input type="checkbox"/>

Description of useful combination of renovations and stepwise implementation for further renovation options not included in the Main option:

Further information

The following link(s) provide further information on energy performance certification, use of EPCs and renovations to improve energy performance including financial assistance programmes:

- *Website A*
- *Website B*
- *Website C*



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Annex 2: Content for p.1 of the EPC template proposed by the European Commission (for comparison with the enhanced template proposed by QualDeEPC)

In **Annex V** to the EPBD, the European Commission has proposed a template for the EPCs, which the Member States should follow from 2026 at the latest (**Art. 16 (2)**). Annex V holds that:

1. On its front page, the energy performance certificate shall display at least the following elements:

- a) the energy performance class;
- b) the calculated annual primary energy use in kWh/(m² year);
- c) the calculated annual primary energy consumption in kWh or MWh;
- d) the calculated annual final energy use in kWh/(m² year);
- e) the calculated annual final energy consumption in kWh or MWh;
- f) renewable energy production in kWh or MWh;
- g) renewable energy in % of energy use;
- h) operational greenhouse gas emissions (kg CO₂/(m² year));
- i) the greenhouse gas emission class (if applicable).