

REHVA position paper on the European Commission proposal of the revised ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE COM(2016)0765

General remarks

REHVA supports and appreciates the principles of EPBD aiming both at the improvement of energy performance in new buildings with cost optimal minimum requirements, as well as at the improvement of energy performance in existing buildings with incentives. REHVA welcomes the binding 30% energy efficiency target of the revised EPBD and is confident that the building sector can and should contribute more to achieving it. While staying on track with highly ambitious nZEB targets for new buildings, **the EPBD must put more focus on the energy refurbishment of the existing building stock**, including the **replacement and upgrade of inefficient technical building systems that waste energy and don't deliver good indoor environment quality**. The revised EPBD shall better tackle this challenge and aim at **strengthening the implementation and its enforcement**.

Ensuring high indoor environment quality and energy efficiency at the same time

Health and comfort of consumers should be ensured and improved in all buildings, especially when implementing deep energy retrofit projects. To achieve this, REHVA advocates for indoor environment quality (IEQ) related requirements in the EPBD. REHVA welcomes that Annex I of the legislative proposal mandates Member states to ensure minimum environment quality levels. However, to provide and maintain good and healthy indoor climate, IEQ aspects should be further strengthened in the directive.

1. The revised EPBD should set a clear mandate for Member States to **define indoor environmental quality requirements that are monitored and reported in a harmonised way** in building regulations across Europe.

2. **IEQ criteria shall be part of the inspection** of heating and cooling systems, and continuously monitored alongside the energy performance of the buildings.
3. REHVA recommends developing an indoor environmental quality indicator to be used beside the primary energy indicator. This **IEQ indicator shall be reported in a transparent way in the energy performance certificates**. EPC-s shall provide information about indoor air quality (ventilation rate) and about the indoor thermal environment (summer and winter). This can be implemented based on the prEN 16798-1 standard (or its equivalent the ISO 17772-1), displaying in the EPC-s a reference to the IEQ categories as defined by the standard.
4. The **definition of technical building system** should be changed to: "Technical equipment and systems for heating, cooling, ventilation, humidification, dehumidification, domestic hot water, lighting, building automation and control and electricity production used to control **indoor environmental parameters** in a building," to cover also solar shading and daylight control, and air cleaning.

Ensuring quality, proper maintenance, and performance through mandatory inspection of heating, ventilation, and air-conditioning systems

The EPBD should address the quality of installed technical systems, including their regular maintenance, and support the replacement of the old equipment where appropriate. The inspection of technical building systems is of key importance in this process, because it can ensure quality, compliance with standards and building codes, as well as high energy performance. Therefore, the **EPBD shall maintain and improve Articles 14-15** on the inspection of heating and air-conditioning systems. Furthermore,

it is advisable to extend the scope to **ventilation and air-conditioning systems**, as these are often combined and ventilation has a significant impact on energy and IEQ. The original articles were poorly implemented as it was not clear how the outcomes were to be used or enforced. REHVA welcomes that the Commission aims at improving the current requirements. However, some important aspects are not clear or missing in the proposed new version, and the requirements on the alternative continuous monitoring and BAC are technically and practically too complex to be implemented and enforced. The issues to improve are detailed below.

1. Setting and measuring clearly defined target values in a transparent way

The primary intention of the EPBD is to cost-effectively improve the energy performance of buildings. This primary intention can be achieved by stating performance requirements, but the technical means of implementation should be let open and technology neutral. Then the market can find cost optimal solutions that is important for encouraging innovation and continuous development.

The EPBD shall mandate Member States to set up and enforce a transparent inspection process with clearly defined criteria ensuring the following points:

- The inspection must be based on a set of generally defined system parameter values (system temperatures, flowrates, schedules, specific fan powers, COPS etc.) for individual components and systems (e.g. boilers, air handling units, CHP, chillers, heating circuits etc.). Data for the testing must be provided by the systems (components, BAC, monitoring systems, etc.) for inspection according to minimum standard data criteria (scope, format) that each system has to provide.
- Energy use and power demands shall be reported at the level of the various technical building systems and occupant controlled non-EPB uses (small power, lighting, and process loads).
- The measured values, design specification and product data shall enable a transparent and explicit evaluation for detecting whether a specified performance is met or not. These tests must be carried out in a technical system independent from the BAC (because the BAC data may be wrong) by an independent third party.
- Based on the results of the above evaluation, the inspection should provide guidance on the potential energy savings possible.

2. Continuous monitoring, energy management, and building automation and control (BAC)

REHVA promotes continuous monitoring and the analysis of operational data to operate buildings in a cost-effective way using automated data input. However, the currently proposed requirements (paragraphs 2, points a-c in articles 14-15) mix the different competences and roles of proper operation and of the inspection process testing it. The **requirements as defined now are technically too complex and difficult to implement and to enforce by the regulatory framework**. Problems of the requirements a-c:

- *“(a) continuously monitoring, analysing and adjusting energy usage;”*
BAC can support this function from a central place, but not implement the complete process. The adjustment is usually done by a system operator, who is largely responsible for the building performance (e.g. by setting schedules, set points and manual operation) and has therefore to be part of the inspections scope.
- *“(b) benchmarking the building’s energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;”*
BAC and all the connected services are part of the same system and therefore responsible for the performance of the building. BAC can help in detecting losses, however benchmarking a buildings energy efficiency and identifying improvement opportunities requires understanding of wider context beyond simply the building services. An external service should verify the achieved benchmarked performance, referring to wider world benchmarks and possibilities.

BAC systems are an important means of improving the energy efficiency of buildings, however, the performance of HVAC and BAC systems are highly sensitive to errors in design, construction, and operation. There are numerous examples of BAC systems not working as intended, as they are complex systems whose interaction with the buildings they serve are often not fully understood by their operators.

Therefore, equally important as the systems themselves is the quality management for testing the systems performance. Third party testing through well-defined regular inspections or continuous monitoring shall be a mandatory requirement for buildings. This can ensure the closing of the gap between designed and actual energy performance.

- “(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.”

The requirements on connectivity and interoperability are not linked to the inspection of systems, but go beyond the scope of these articles. It is more appropriate to **move this requirement to article 8. on smart buildings.**

Promoting the harmonized and ambitious application of EPB standards in Europe

REHVA welcomes the approval of the new European standards linked to the EPBD that are of key importance in the compliant implementation of the EPBD. The **EPBD must refer explicitly to the new EPB standards** and promote that national requirements and methodologies are developed in line with European standards. After the approval of all but one EPB standards developed under Mandate 480, **REHVA calls**

for strengthening the role of EN standards, and for their **harmonised** and ambitious **application in the European Member States**. This can drive toward a common European market and generally strengthen European competitiveness.

REHVA supports the effort to **harmonize national calculation methodologies to ensure a minimum quality and reliability of the energy performance assessment**. The proposed description of national methods by using the national annexes of the EN standards is in right direction but before the application in all MS it would be wise to test the method with a set of sample MS. If needed, the format of national annexes could then be further developed, as the application of present annexes might be problematic if the national methods are very different. It is also important to compare the results of national methods to the results of the European standards' method. For that purpose, some new activities such as the development of test cases and a common exercise to compare the results of national calculation methodologies could be foreseen to ensure minimum quality and confidence in figures given by MS. ■



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About REHVA: The Federation of European HVAC Associations, founded 1963, joins European associations in the field of building engineering services representing more than 100.000 HVAC engineers and building professionals in Europe. REHVA is the leading independent professional HVAC organization in Europe, dedicated to the improvement of health, comfort and energy efficiency in all buildings and communities. It encourages the development and application of both energy efficiency and renewable energy technologies.