Remarks on the European Commission's Proposal for a Recast of the Energy Performance of Buildings Directive (EPBD)

The Air Infiltration and Ventilation Centre AIVC, welcomes the proposed recast of the EPBD as presented by the European Commission on December 15th, 2021, and hereunder proposes amendments for improvement.

Remark 1: About setting minimum energy performance requirements (Article 5)

The proposal addresses the importance of taking general indoor climate conditions into account when setting minimum energy requirements (Article 5, paragraph 1). Considering indoor environmental quality, it is important to avoid negative effects of measures to meet energy performance requirements in buildings, for instance poor ventilation, inadequate (day)lighting, etc…

Proposal for amendments:

- In general: AIVC proposes to emphasize the importance of indoor environmental quality in relation to setting minimum energy performance requirements. Many people regard climate to only include thermal comfort and IAQ, while it also includes acoustic and visual comfort. Indoor environmental quality is a more precise term for this.
- In Article 5, paragraph 1, AIVC proposes the modification as follows (in bold): *"Those requirements shall take account of ~~general indoor climate conditions~~* ***minimum standards for indoor environmental quality****, in order to avoid…"*

Remark 2: About existing buildings (Article 8)

It is important to use renovation works of existing buildings as an opportunity to improve the existing buildings' energy performance and indoor environmental quality. This is expressed in Article 8 on existing buildings. However, by limiting the necessary measures that Member States need to take to 'major renovations', opportunities for improving building performances, also in relation to creating healthy indoor environments, might be missed.

Proposal for amendments:

- In general: AIVC proposes to broaden the scope of Article 8, paragraph 3, which addresses the issues of healthy indoor climate conditions in existing buildings, to all renovation works.
- In Article 8, paragraph 3, AIVC proposes the modification as follows (in strikethrough): *"… Member States shall address, in relation to buildings undergoing ~~major~~ renovation, the issues of healthy indoor climate conditions, …"*

Remark 3: About inspections (Article 20)

AIVC is very pleased with the proposal to impose mandatory inspection of ventilation systems. The recently published EPBD 19a feasibility study found installed ventilation systems in the EU often non-compliant and of insufficient quality of operation. Ventilation systems not functioning as expected result in poor indoor air quality, indoor climate problems and/or increased energy consumption. The proposed article 20 specifies that member states shall lay down the necessary measures to establish regular inspection of ventilation systems.

Various studies (i.e. SAVE-DUCT project etc.) and practice have shown, that the air-tightness of many air distribution systems is poor to very poor, resulting in less good indoor air quality and/or a higher energy consumption. The measurement of the ductwork air-tightness is a relatively easy measurement allowing a straightforward assessment. Measurement techniques are covered in EN 12237:2003, EN 13403:2003, EN 14239:2004, EN 1507:2006, EN 15727:2010, EN 12599:2012, EN

17192:2018. Ductwork air-tightness testing is already standard practice in several countries (e.g., Belgium, Finland, France, Norway, Portugal, Sweden, UK)(1).

Proposal for amendments:

- In general: AIVC proposes to list a number of minimum requirements regarding the necessary measures to be laid down by the member states, including ductwork air-tightness assessment.
- In Article 20/ paragraph 4: AIVC proposes the modification (in bold) which follows: *"The inspection shall include the assessment of the generator or generators, circulation pumps,* ***ventilation systems*** *and control system. Member States may decide to include in the inspection schemes any additional building systems identified under ANNEX I"*
- In ANNEX I/ paragraph 4: AIVC proposes the modification (in bold) which follows: *"(d) natural and mechanical ventilation* ~~*which may include*~~ ***including ductwork*** *air-tightness;"*

Remark 4: About inspections (Article 20)

The present specification in Article 20/ paragraph 1, is that inspection is mandatory for systems above 70 kW. This limit is not so relevant for ventilation. Our proposal is to impose inspections for all ventilation systems which are larger than typical residential ventilation systems. Therefore, we propose to impose inspections for all ventilation systems with a nominal air flow rate above 1000 m^3/h, an upper limit for residential ventilation systems in relation to eco-design requirements for ventilation units.

Proposal for amendments:

- In ANNEX I/ paragraph 1: AIVC proposes the modification (in bold) which follows: *"Member States shall lay down the necessary measures to establish regular inspections of heating, ventilation and air conditioning systems, with an effective rated output of over 70 kW* ***or a nominal air flow rate above 1000 m^3/h****. The effective rating of the system shall be based on the sum of the rated output of the heating and air-conditioning generators."*

Remark 5: About inspections (Article 20)

In article 20, paragraph 4, a new sentence is added in the proposal to specify the minimum elements to be included in the inspection scheme for ventilation systems. In the proposed specification the assessment of the sizing of the ventilation system is the main element, which mainly relates to the design of the ventilation systems. However, as explained before, the recently published EPBD 19a feasibility study found installed ventilation systems in the EU non-compliant and of insufficient quality of operation, not only as a result of design flaws, but also as a result of installation and workmanship errors, lack of commissioning and maintenance problems. In order to address these problems, inspection schemes should address not only the sizing of the system, but the overall operation of the system.

Proposal for amendments:

- In general: AIVC proposes to broaden the scope of Article 20, paragraph 4, which addresses the inspection scheme for ventilation systems.
- In Article 20, paragraph 4, AIVC proposes the modification as follows (in bold): *"The inspections scheme shall include the assessment of the sizing* ***and operation*** *of the ventilation system compared with the requirements of the building and…"*

Remark 6: About COMMON GENERAL FRAMEWORK FOR THE CALCULATION OF ENERGY PERFORMANCE OF BUILDINGS (ANNEX I)

Research and practice show that many buildings have a poor to very poor building air-tightness level which has a significant impact on energy use, indoor air quality and the functioning of ventilation systems, among others (2,3,4,5,6). On average, in many existing buildings, air infiltration losses correspond to 10% or more of the total energy losses (7).

Proposal for amendments:

- In general: AIVC proposes to include building air-tightness related aspects (mandatory assessment, measures to improve, etc.) as a minimum requirement for ANNEX I.
- In ANNEX I/ paragraph 4: AIVC proposes the modification (in bold) which follows: *"The methodology shall be laid down taking into consideration at least the following aspects:*
  (a) the following actual thermal characteristics of the building including its internal partitions:
  (i) thermal capacity;
  (ii) insulation;
  (iii) passive heating;
  (iv) cooling elements; ~~and~~
  (v) thermal bridges;
  ***(vi) building air-tightness;**"*

Remark 7: About the installation of measuring and control devices for the monitoring and regulation of indoor air quality (Art. 11)

AIVC is pleased with the recognition of good indoor air quality in the proposal to ensure healthy buildings. Article 11, paragraph 3, introduces the requirement to install measuring and control devices for the monitoring and regulation of indoor air quality in new buildings and existing buildings undergoing major renovations. This requirement will for sure raise awareness and gradually improve indoor air quality in the building stock of the member states. Although the term 'control devices' can be interpreted in different ways, AIVC understands that this is on purpose to allow for a wide variety of control strategies to ensure acceptable indoor air quality, including natural, mechanical or hybrid ventilation systems, smart ventilation, air cleaning, etc.

Who we are:

The AIVC (Air infiltration and Ventilation Centre) is the International Energy Agency's information centre on energy efficient ventilation.

In recognition of the significant impact of ventilation on energy use, combined with concerns over indoor air quality, the International Energy Agency (IEA) inaugurated the Air Infiltration and Ventilation Centre in 1979 (To be more precise, the AIVC is one of the annexes running under the Energy in Buildings and Communities (EBC) Programme which is one of the Implementing Agreements of the IEA). With the support of its member countries as well as key experts and associations, the AIVC offers industry and research organisations technical support aimed at better understanding the ventilation challenges and optimizing ventilation technology. The Centre offers a range of services and facilities, including comprehensive database on literature standards, and ventilation data.

AIVC also produces a series of guides, technical notes and ventilation information papers (among others). The Centre holds annual conferences, workshops and webinars.