

Ecodesign Requirements for Non-Residential Ventilation Units - What might come?

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AGENDA

- **Something about EVIA**
- **Ecodesign Directive**
- **Definition**
- **Ecodesign Requirements for NRVU**
- **Current Discussion**
- **Timetable**

MISSION STATEMENT OF EVIA

EVIA aims to promote highly energy efficient ventilation applications across Europe, with high consideration for health and comfort aspects. Fresh and good indoor air quality is a critical element of comfort and contributes to keeping people healthy in buildings.

EVIA takes the view that the ventilation sector can contribute to the energy efficiency targets set by the EU. Heat recovery in ventilation systems for instance can result in avoiding large heat losses in buildings and therefore contribute to the overall energy performance of a building.

EVIA Working Groups

- EVIA Residential Working Group
- EVIA Non-Residential Working Group
- EVIA Fans Working Group
- EVIA Ventilation 2020



WHAT EVIA STANDS FOR

- Promote high indoor air quality and energy recovery through quality solutions (products and installation) at European and national levels;
- Promote the idea that recovered energy is at least as environment-friendly as renewable energies and that recovered energy deserves equivalent consideration in EU policies;
- Secure that regulations will take the quality aspect of ventilation systems including their installation into account;
- Spread best practices regarding design, installation and maintenance;
- Support suitable training curriculum and quality insurance for installations throughout Europe;
- Support a harmonisation of local product approval processes towards common European standards.

ECODESIGN DIRECTIVE

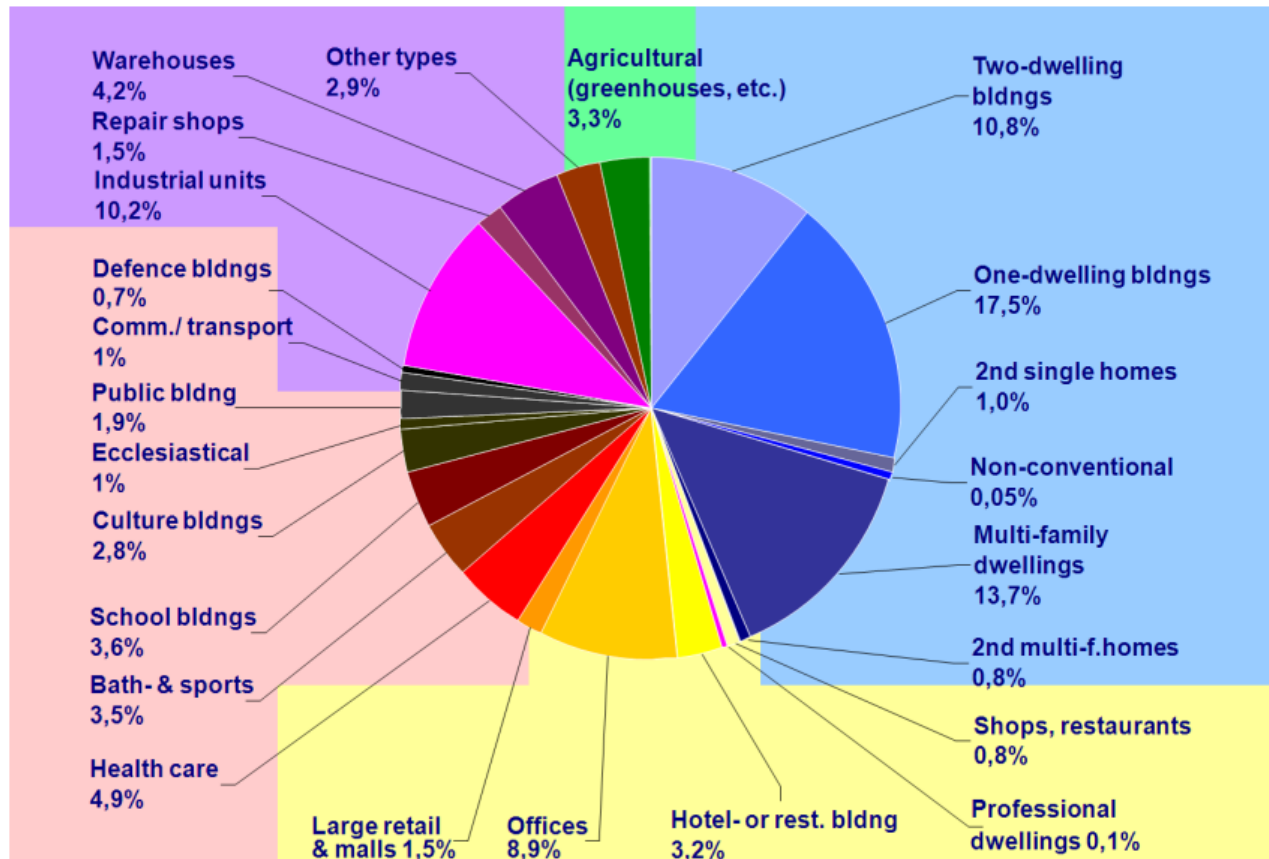
- The European Commission has decided to lay down minimum energy requirements for air handling units within the Ecodesign Directive (ErP-Energy Related Products).
- Devices that do not meet the defined minimum requirements may in the EU no longer be marketed.
- Since the 1st of January 2013 such requests already for fans (EU 327/2011) and for room air conditioners (EU 206/2012) are effective.
- Since October 2012 there is a first draft of a regulation for ventilation systems. This was on the 6th of November 2012 discussed in Brussels in a consultation forum with the associations and government representatives.
- It is expected from these measures energy savings of 1,300 PJ (1 PJ = 10¹⁵ Joule) of primary energy.



ECODESIGN DIRECTIVE

EU27 Building volume: ca. 100-110 bln. m³

*Fresh air introduced in heated buildings: ca. **100 bln. m³/h*** (92 heated)*



**= sum of ventilated heated space and unheated, mechanically ventilated space;
naturally ventilated unheated buildings not occupied by humans (stables, warehouses) not taking into account.*

DEFINITION

- “Ventilation unit (VU)” means an appliance equipped with at least a fan, motor and casing intended to replace utilized air by fresh air in a building or part of a building

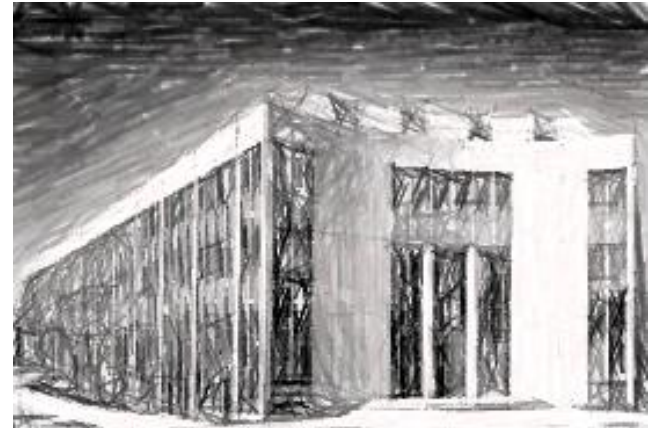
- What does this mean if the AHU or fan unit is used to:
 - Cool a room ?
 - Cool a machine or switch board?

- The manufacturer of the unit does not know the application!



DEFINITION RVU AND NRVU

- Less 125 W is Residential ventilation (RVU)
- Over 250 W is Non-Residential Ventilation (NRVU)
- Between 125 and 250 W and lower the 100 Pa pressure drop the manufacturer has to declare
- These definitions do not reflect the market



ECODESIGN REQUIREMENTS FOR NRVU

In the regulation minimum requirements for ventilation equipment in the non-residential sector are required ($\sim > 125$ W per fan). The main parameters are:

- Efficiency of air flow (fan is built-in)
- Heat recovery
- Air velocity in the unit (pressure drop)
- Acoustics

The Regulation applies to:

- Supply and exhaust air devices (bidirectional devices)
- Supply air and exhaust air units (unidirectional devices) with slipstream.

ECODESIGN REQUIREMENTS FOR NRVU

According to the draft dated October 2012 for AHUs are essentially the following minimum requirements proposed:

- Heat recovery is required for bidirectional devices. At least:
 - Energy efficiency $\eta_e \geq 64\%$ in Tier 1 (Class H2 according to EN 13053)
 - Energy efficiency $\eta_e \geq 71\%$ in Tier 2 (Class H1 according to EN 13053)
- For the efficiency of fans two different criteria are proposed:
 - The limits for backward curved fans of the Directive at a discount to the installation conditions
 - P_m classes to EN 13053. Class 2 in Tier 1 and class 1 in Tier 2
- The maximum air velocity in the device cross-section according to EN13053
 - Maximum of 1.8 m/s in Tier 1
 - Maximum of 1.6 m/s in Tier 2
- Filter must have a low pressure drop

PRODUCT INFORMATION REQUIREMENTS ON NRVU

Following aspects should to be added:

- The intended use of the unit.
- Specific Fan Power of the unit according EN 13779
- Casing air leakage class according EN 1886
- Thermal insulation class EN 1886
- Thermal bridging factor class EN 1886
- Filter classes according EN 779 of the unit and recommended filter classes according EN 13779
- Filter bypass leakage in % of nominal air volume flow
- Heat recover leakage according EN 308 at the nominal operating point as selected
- The grade of enthalpy or humidity recovery
- Sound power level of Noise emitted at the casing and at the duct connections

CURRENT DISCUSSION

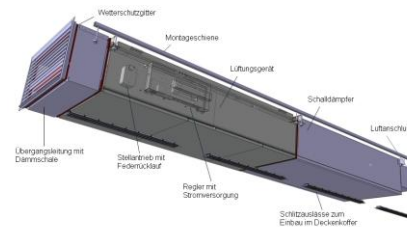
- Residential Ventilation units are tested at 100 Pa but typically they can reach higher values.
- There is a wide range of Non-Residential ventilation units lower than 125 W
 - Box and Roof Fans
 - Decentralized Air Handling Terminals
 - School Ventilation units serving 300 – 900 m³/h , 15m³/(hm²)
 - Central Heating Ventilation Units (CHRV)



20..35 W max. 100W



30..125 W



65 W



< 100 W

CURRENT DISCUSSION

The industry has the urgent request to

- Delete all the electrical power limits
- Use the „Declaration of Intended Use“

Split between the product groups

- Residential Ventilation Unit
- Non-Residential Ventilation Unit
- Box and Roof Fan considering the EU 327/2011 „Fan Regulation“



Proposal for a compromising Definition

- More than 1,000 m³/h nominal air volume flow is NRVU
- Less than 1,000 m³/h nominal air volume flow the manufacturer declares the intended use
- Depending on what the manufacturer declares, he must comply with the relevant requirements of the Regulation

CURRENT DISCUSSION

RVU/NRVU

The proposal to differentiate between RVU and NRVU of EVIA was from Confutation Forum received and has a good chance to be absorbed in the working document.

SFP

The SFP value for the assessment of NRVU unsuitable. The specific fan power value according to DIN EN 13779 allows only a rudimentary assessment of the entire air-conditioning system. The efficiency of the air handling unit is taken into account only indirectly. For the SFP value is largely determined by the external pressure drop. That is not influenced by the manufacturer, nor on the quality of the device.

In the Consultation Forum, the subject of efficiency of fans was hotly debated. Further discussions will show how a compromise can be found here.

Maximum air velocity

The proposed maximum air velocity and heat recovery will lead to much larger devices. The implementation could cause problems in the renovation, if the building does not have enough space.

TIMETABLE

The following timetable for the implementation of the Ecodesign Directive provides:

- Completion of a stable version of the working document in May 2013
- Transfer of the Inter-Service Consultation into the Commission
- After the summer break, the vote shall be taken by the regulatory board
- After the vote, the adopted version goes to the parliament for approval
- In the year 2013/14 the regulation is in effect
- From 2015/16 the products meet the requirements of Tier 1
- From 2017/18, the products meet the requirements of Tier 2



**Thank you for your attention
and**

EVIA wish you a constructive time at the ISH 2013