Stakeholder Consultation Meeting – Follow-up Study on the Review of 1253 (Ecodesign) & 1254 (Energy Label) for Residential / Non-Residential Ventilation Units

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Agenda

- Introductions & Housekeeping
  - Slides will be published on the study website
- Scene setting from DG GROW
- Background to the Study
- Phase 1.2 – Updating of the Draft Regulations
  - Residential Ventilation Units
  - Non-residential Ventilation Units
- Phase 2.1 – Impact Assessment
- Comments, Feedback & Next Steps

European Commission

Housekeeping rules of the meeting

- During each sub-session of presentation, virtual participants will be able to pose written questions or to ask for the floor (type [name organization] + ‘floor please’ [+topic]). Please write them in the chat when invited to do so by the Chair, starting with the name of your organisation (questions without the organisation name will not be considered).
- The questions will be answered at the end of each sub-session. In case of time constraints, priority in replying to the questions will be given, based on the order in the chat. Everyone remains muted (unless speaking when invited by the Chair)
- **Concise** intervention or question

NB: The chats will not be kept/copied. Please do **not** make comments in the chat area unless invited by the Chair.

Scene setting from DG GROW

Background to the Study

Aims & Objectives

Supporting the Commission with technical expertise for the assessment of the items listed in phase 1.1.

Update the two draft revised Regulations presented at the Consultation Forum meeting of March 2021, based on the analysis and elaborations of objective 1.

Provide input to the preparation/update of the impact assessment report by the Commission services in line with objectives 1 and 2.

The main <u>**aim**</u> across the three objectives is to support the Commission in the development of regulatory solutions that fulfil the following criteria:

- The policy solution is in line with the environmental objectives of the ED/EL Regulatory Frameworks
- The policy benefits from the widest support from stakeholders
- The policy solution is legally feasible and verifiable within the ED/EL Regulatory Frameworks

Scope

Phase 1

Phase 1.1 – Technical analysis
This involves supporting the Commission with technical expertise for the detailed assessment of all the comments received at the Consultation Forum meeting of March 2021 and presented as items a-i in the ToR.

Phase 1.2 – Update of the draft Regulations
Based on the findings and conclusions from Phase 1.1, update the two draft revised Regulations presented at the Consultation Forum of March 2021.

Phase 2

Phase 2.1 – Impact Assessment
Starting from the draft impact assessment report and based on the findings from Phase 1, deliver an impact assessment study, assessing the impacts of ventilation units and modelling different scenarios of alternative ED and EL policies.

Schedule

Completed:

✓ Phase 1.1 Technical Analysis

✓ 1st Stakeholder consultation meeting (July 2024)

In progress:

❑ Follow-up stakeholder consultation & processing of feedback

❑ Drafting of Phase 1.2 Updating the Draft Regulations in line with Phase 1.1

❑ Phase 2.1 Impact Assessment

Study ends July 2025

https://eco-ventilation-review.eu/

Phase 1.2 – Updating of the Draft Regulations

Concerning residential ventilation units

Product Label vs. System Label

- **What are the pros and cons?**

- Product label:
  - Pros - allows for general distribution of mass-produced products. Product description allows product to be installed in any application that requires its performance characteristics
  - Cons - does not define the installed energy performance, and relies on assumptions
- System label:
  - Pros – more accurate installed performance, takes into account external factors. Can be designer and installer friendly
  - Cons – confines prescribed parameters/installation specifications. Requires knowledgeable design and specific application knowledge potentially narrowing product distribution. Risk of incorrect grading

Product Label vs. System Label

- **Stakeholder views:**
  - Eurovent – Labelling requirements "should only consider product related features and performance"
  - AMCA - less support for a system label, particularly for RVUs, due to them typically being mass-produced at the product level
  - Customers are buying a unit, not a system
  - Difficulty in comparing different units with the system label
  - Labelling scaling – not effective for the decision-making process
  - Labelling must be kept simple and clear for the end-users
  - Climate zone scaling – necessary
  - SEC/CTRL factors unclarity - may lead to misrepresentation of product performance

Product Label vs. System Label

- **Can the system label realistically be implemented and verifiable?**

- Verifying a ‘system’ label – must confirm that all of the elements of the system are included.
- Challenges:
  - Implementing/verifying on a broad basis
  - Barrier for accurate consumer product acceptance
  - Difficult to enforce

Recommendation

- Standardised product performance ratings can be compared by end users and system designers.
- The specificities of particular changes to the SEC formula are expanded upon in the following two sub-sections.

Split label between UVU and BVU

- **Is this split distinction feasible, needed, relevant?**
- **What is the “unfair” (if any) treatment of UVUs in the current SEC formula?**

- Feasible, potentially relevant
- Dependent on stakeholder input
- Same fundamental ventilation functions of BVUs and UVUs
- Split needed if grading of UVUs too poor, discouraging efficiency R&D
- SEC – lower CTRL factor increases energy efficiency class
- BVUs inherently more efficient – improved efficiency necessary in their grading

Split label between UVU and BVU

- **What is presently not reflected by the SEC calculation is the UVUs impact on a building's natural infiltration and exfiltration.**

- Ideally installed BVUs are balanced and have no impact on the pressure on the building envelope and therefore no impact on the natural infiltration rate.
- For BVUs, conditioned air cost includes the natural infiltration rate plus the differential in sensible recovered energy.
- An exhaust UVU puts the building under negative pressure by design.
- Total amount of 'new air' is accounted for in the increased infiltration.

Split label between UVU and BVU

- **What are pros & cons of having/ not having split label?**
- **What were the stakeholder views regarding two approaches?**

- Pros - UVUs can achieve a higher grade with split scaling; manufacturer incentivisation for efficiency R&D
- Cons – Split scaling discourages comparison between UVUs & BVUs
- Stakeholder views
  - No split, as their function is the same
  - UVUs are much simpler, so should be split
  - CTRL factor must reflect their technical differences

Changes to the SEC formula

- **Updated p_{ef}**
- **A new η_h-value (average space heating efficiency)**
- η_e **for the different climate zones (total energy recovery)**

- Primary energy factor value change to 2,1 instead of 2,5
- Balancing the SEC values for UVUs and BVUs for the changed energy-shares (energy sources oil, gas, elect, renew, etc.) for residential heating in the European market.
- The ηh change to 0,92 from 0,75
- Heat recovery BVUs condense moisture on the exchanger core and use a variety of approaches to defrost the core in freezing weather.
- Enthalpy BVUs transfer moisture from the moister air stream to the drier air stream with no interruption for defrosting.
- The ηe has been adjusted to reflect the performance variation in different climates.

Changes to the SEC formula

- **Separate MISC factor**

- To balance single room units with central units
  - Non-ducted 1,0 and ducted 0,73
- Ducts bring benefits in terms of ventilation efficiency. Values distributed around unity with the aim of not altering the average outcome of the energy saving parameter.

Recommendation

- No split
- Allow for single comparative label because BVUs and UVUs are not always interchangeable

Product vs. System effects of the revised CTRL factors for EL calculation

- **What are the savings assoc. to factoring in system parameters?**
- **What are the challenges for the assessment of CTRL factors?**
- **Is it viable to exclude / simplify the system parameters that are not verifiable?**

- Operational savings – derived from managing the conditioned air cost after installation
- Conditioned air cost and electricity consumption minimised if a ventilation unit operates only when needed
- Challenges:
  - Relies on the operator's decision
  - Human sensitivity – operator may not notice IAQ issues such as CO_2, CO or particulates
  - Occupant understanding/sensing of olfactory invisible contaminants
  - Viable to verify if all product components (including control/defrosting elements) are packaged with the product

Product vs. System effects of the revised CTRL factors for EL calculation

- **In case it is viable, what are the pros & cons of an exclusion / simplification of the parameters?**
- **What were the stakeholder views regarding the use of parameters?**

- Pros – improve replicable, comparative accuracy, e.g., product either has heat recovery or not
- Cons – reduces the granularity of the result
- Stakeholder views:
  - Eurovent – risk of loopholes/selective calculations, trading off energy efficiency in return for including controls
  - Recommend EVIA's 'EVIA Comments on Residential Ventilation Units Control Aspects' – simplified table of control factors.
  - If controls must be labelled, then manufacturer should be responsible for the product label, and installer for the system label
  - EVIA – currently proposed control factors not feasible. Recommends Ventilation Performance Assessment (VPA) calculation tool
  - Advocate to not implement an additional indicator for ventilation performance on the label

Product vs. System effects of the revised CTRL factors for EL calculation

Table 1.3 EVIA CTRL Factors for Residential Ventilation[8]

CTRL	Control			
	Current 1253	Central	Zonal Min 2 Zones	Local
Manual	1,0	1,0	0,95[(a)]	0,90[(a)]
Clock	0,95	0,95	0,85	0,80[(a)]
Central	0,85	0,85	NA	NA
Zonal	0,65	0,75	0,65	NA
Local	0,65 (0,5)	0,65	0,55	0,45

[(a)] Further consideration needed to avoid too much detail and too many options.

- Operation of the ventilation unit has moved well beyond on/off operation.
- Flow rate control has advanced with motor technology
- Sophisticated or smart control allows ventilation response to immediate conditions.
- The granularity of the CTRL values in the formula have been generalized to make application simpler and more logical and more consistent.

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Updated Q_{defr} values: proposal from CEN/TC 156/WG 2: Project Group EN 13142:2021

(calculated for:

- Average space heating efficiency ηh = ***0.92***
- Primary energy factor for electric power generation pef = ***1.9*** *)*

Q_{defr} for heat exchangers with a humidity transfer of less than 60% for average climate and less than 80% for cold climate.

Depending on the frost protection strategy used in the residential BVU the following default values for Q_{defr} shall be used.

Frost protection strategy	Explanation	Q_{defr} in kWh/m2/a		
		Cold	Average	Warm
E1	Electric preheating; 1 stage, controlled by outdoor temperature inlet in ventilation unit	27.6	5.0	0.0
E2	Electric preheating; 2 stage, controlled by outdoor temperature inlet in ventilation unit	15.9	2.4	0.0
E3	Electric preheating; variable, controlled by outdoor temperature inlet in ventilation unit	7.2	0.7	0.0
E4	Electric preheating; Stepless variable, controlled by outdoor temperature inlet in ventilation unit and additional temperature or pressure sensor in exhaust air	6.5	0.7	0.0
E5	Electric preheating; variable, controlled by air inlet conditions in ventilation unit and additional sensor for pressure difference or air flow rate. No bigger disbalance than 10%.	(6.5) [1)]	(0.7) [1)]	0.0
L1	Lowering supply air flow rate; ventilator shut off	18.5	3.4	0.0
L2	Lowering supply air flow rate; stepless variable, controlled by outdoor temperature inlet in ventilation unit	8.7	0.9	0.0
L3	Lowering supply air flow rate; stepless variable, controlled by outdoor temperature inlet in ventilation unit controlled by outdoor temperature inlet in ventilation unit and additional temperature or pressure sensor in exhaust air	7.8	0.8	0.0
B1	Bypass for defrosting; Bypass full open	31.6	5.7	0.0
B2	Bypass for defrosting; stepless variable, controlled by outdoor temperature inlet in ventilation unit	14.0	1.3	0.0
B3	Bypass for defrosting; stepless variable, controlled by outdoor temperature inlet in ventilation unit controlled by outdoor temperature inlet in ventilation unit and additional temperature or pressure sensor in exhaust air	12.6	1.2	0.0
B4	Bypass for defrosting; variable controlled by air inlet conditions in ventilation unit and additional sensor for pressure difference or air flow rate. No bigger disbalance than 10%.	(12.6) [1)]	(1.2) [1)]	0.0

The Energy Label Rescaled

- **The Energy label rescaled**
- The Energy Label would be rescaled removing A+, A++, A+++, and setting 'A' as the top efficiency class, thereby ensuring clearer efficiency classifications and leaving the highest class empty to drive innovation.
- These classifications would be as a result of the changes to the SEC formulation.

Table 1
Energy efficiency classes of ducted and non-ducted RVUs

SEC in kWh/a.m²			
Energy Efficiency Class	**Warm climate**	**Average climate**	**Cold climate**
A	SEC<-13,2	SEC < -40,2	SEC < -72
B	-13,2 ≤ SEC < 10,8	-40,2≤ SEC < -34,1	-72,0 ≤ SEC < -62,7
C	-10.8 ≤ SEC < -8,5	-34,1 ≤ SEC < -27,9	-62,7 ≤ SEC <-53,4
D	-8,5 ≤ SEC < -6.2	-27,9 ≤ SEC < -21,7	-53.4 ≤ SEC < -44,1
E	-6,2 ≤ SEC < -3,9	-21,7 ≤ SEC < -15,5	-44,1 ≤SEC < -34,8
F	-3,9 ≤ SEC < -1,5	-15,5 ≤ SEC < -9,3	-34,8 ≤ SEC < -25,5
G	SEC ≥ -1,5	SEC ≥ -9,3	SEC ≥ -25,5

New label design – UVUs

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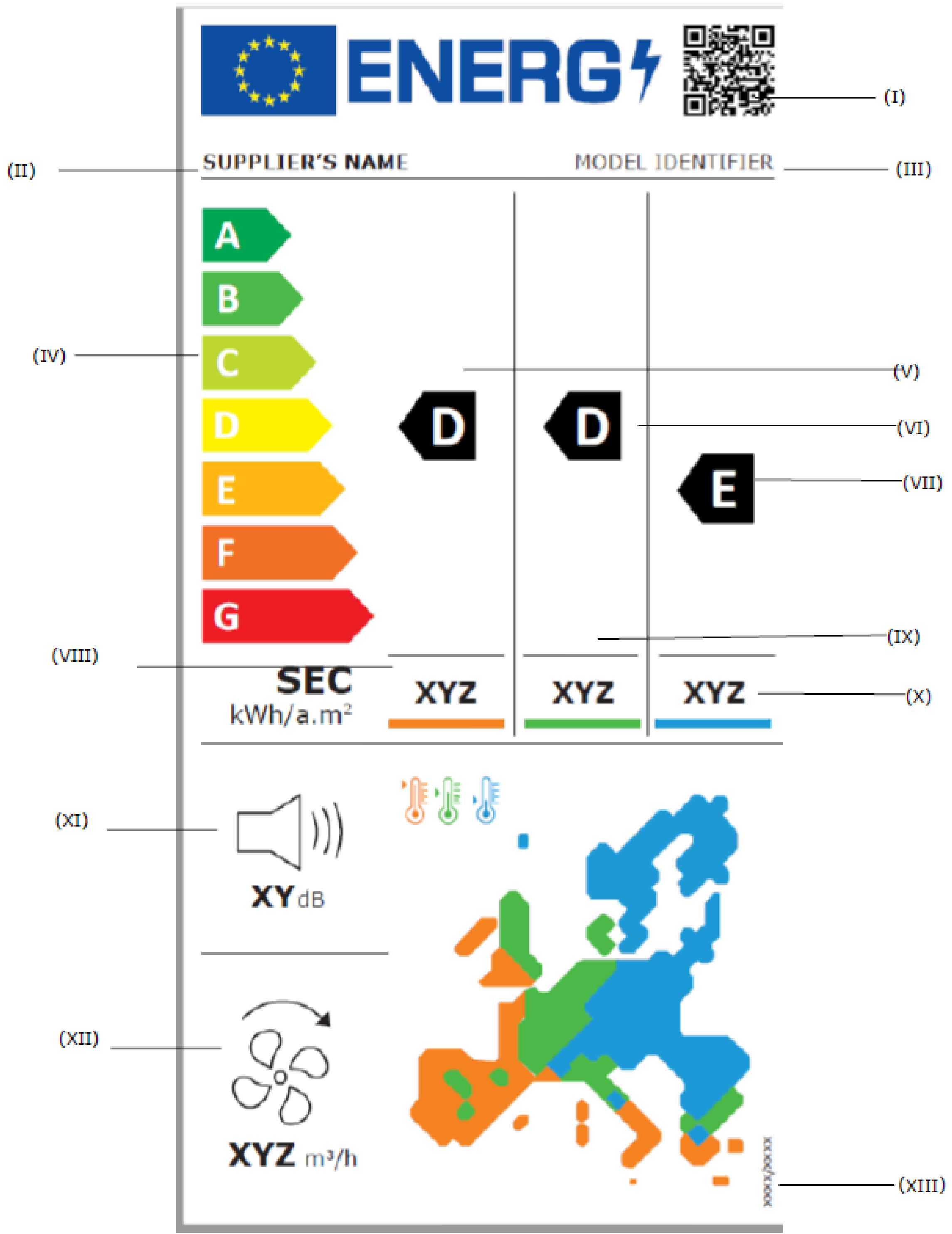
I. QR code;
II. supplier's name or trade mark;
III. supplier's model identifier;
IV. the scale of energy efficiency classes from A to G; 15
V. the energy efficiency class for warm climate determined in accordance with Annex II;
VI. the energy efficiency class for average climate determined accordance with Annex II;
VII. the energy efficiency class for cold climate determined in accordance with Annex II;
VIII. SEC for warm climate expressed in kWh/a per square meter of heated space;
IX. SEC for average climate expressed in kWh/a per square meter of heated space;
X. SEC for cold climate expressed in kWh/a per square meter heated space;
XI. sound power level (LWA) in dB at the reference flowrate rounded to the nearest integer;
XII. maximum flow rate in m³/h rounded



New label design – BVUs

I. QR code;
II. supplier's name or trade mark;
III. supplier's model identifier;
IV. the scale of energy efficiency classes from A to G; 15
V. the energy efficiency class for warm climate determined in accordance with Annex II;
VI. the energy efficiency class for average climate determined ir accordance with Annex II;
VII. the energy efficiency class for cold climate determined in accordance with Annex II;
VIII. SEC for warm climate expressed in kWh/a per square meter of heated space;
IX. SEC for average climate expressed in kWh/a per square meter of heated space;
X. SEC for cold climate expressed in kWh/a per square meter o heated space;
XI. sound power level (LWA) in dB at the reference flowrate rounded to the nearest integer;
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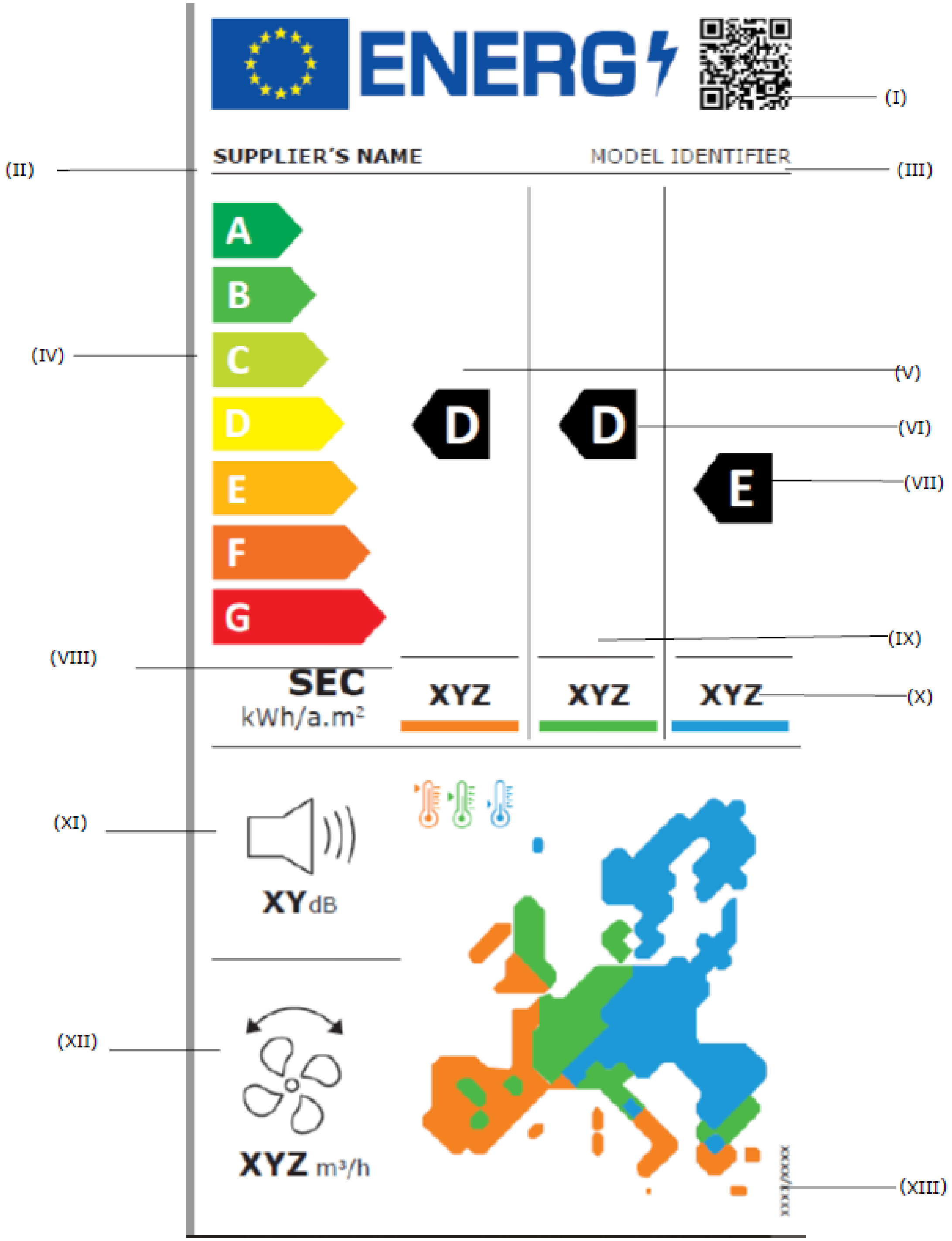


Recommendation

- Proposed changes to the CTRL factor provide subtle changes in the granularity of product efficiency selection
- Risk of unnecessary complexity
- A common calculation tool, similar to the EVIA VPA tool, is recommended to implement

Concerning non-residential ventilation units

NRVUs Thermal efficiency → Temperature ratio

- two approaches:
  - **‘standard’ requirements, independent from the place of installation**
  - **Requirements for NRVUs for which the place of installation is known (‘Option B’)**

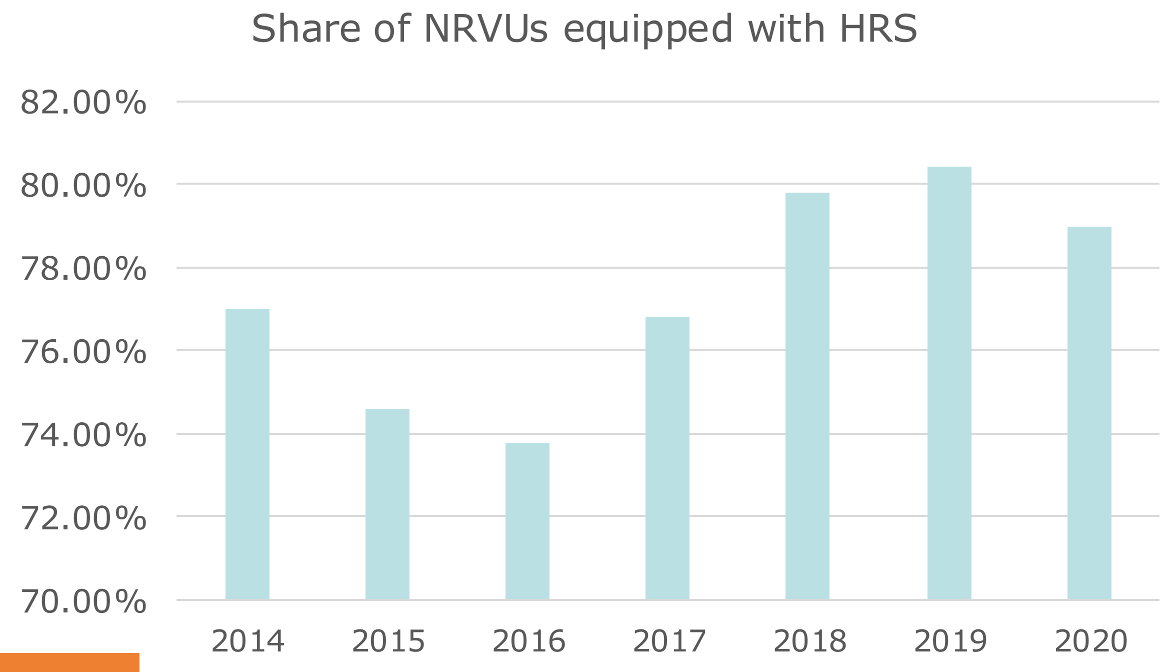
‘Option B’ - rationale

- strong influence of the various EU climatic zones on the cost-effectiveness of the requirement on the minimum thermal efficiency (ηt_nrvu) of the heat recovery system (HRS) of NRVUs

- several stakeholders have been highlighting the fact that in areas with warm climates (i.e. typically Southern Europe), the stringency of the requirement on ηt_nrvu implies the need of installation of a HRS which would result as ‘oversized’ for the average climatic conditions

- (anecdotal evidence): this would result in circumvention/non compliance/lack of HRS

- (attempt to) quantification of the problem→



- Eurovent Data on NRVUs
- Indicative EU market coverage: 60%

European Commission

'Option B' – method(*)

- a mathematical model based on a nonlinear multi-regression analysis was developed, in order to be able to find an economic optimum of the heat recovery in individual cases on the basis of various framework conditions.

- parameters considered in the model:

- - the outdoor air temperature in winter, which represents the respective geographical location,
- - the exhaust air temperature, which represents the respective application of the HRS,
- - the operating time,
- - the balance limit and
- - the load cases (full and partial load) of the HRS.

- As a result, the optimal temperature efficiency of the heat recovery, as well as the therefore required optimal air velocity, the corresponding optimal pressure drop and the represented SFP-Value were calculated.

- In terms of geographic relevance, it is noteworthy to mention that multidimensional optimization was carried out on 46 different locations around Europe, ranging from Paphos (Cyprus) to Turku (Finland).

(*) 'The optimum of heat recovery - Determination of the optimal heat recovery based on a multiple non-linear regression model' (Kaup, 2020)

'Option B' – CF proposal

- ηt_nrvu which not a fixed value, as in Re. 1253/2014, but a value depending on:

- ~~indoor/exhaust temperature of the building,~~
- outdoor winter design temperature and
- ~~hours or operation per year.~~

$$\eta_{e\_nrvu\text{-}min} = -1{,}02302 * ODA - 0{,}05813 * ODA^2 - 0{,}00134\ ODA^3 + \eta_{e\_nrvu\text{-}base}$$

The proposed “new approach” (known & unknown place of installation)

- **What are the benefits of this new approach compared to the existing regulation?**
- **What are the drawbacks (if any)?**

- Benefits:
  - Split would force manufacturers to either account for the most conservative (unknown) minimum outdoor temperature, or to confine their product to the regions with a known temperature where they know they can meet the regulation.
  - Would increase the energy efficiency of products compared to the current regulation
  - Strong scientific basis, backed by research
- Drawbacks:
  - Increased complexity of split requirements may confuse manufacturers
  - Increased market surveillance challenges – enforcing different limits in different countries

The proposed "new approach" (known & unknown place of installation)

- **What were the stakeholder views to the proposed new method?**

- Eurovent:
  - Certain there would be no confusion for either end-users or for manufacturers
  - Essential for a fair comparison - would result in better installations, and thus energy savings
  - Formulas for known vs. unknown were not consistent, suggest changes to formulas to align with each other
  - Proposed a single formula for $\eta_{e\_nrvu\_min}$ and SFP_{int}
  - Resolves the discrepancy error in the draft proposal's formula between the requirement at the lowest outdoor temperature (-14°C) and the requirement for unknown place of installation

The proposed "new approach" (known & unknown place of installation)

- **Subsequent changes to the proposed method (response to EVIA comments):**

- HRS with run-around coil
  - Initially: excessive "double bonus" for both η_{e_base} and $SFP_{int-limit}$
  - Change: bonus removed for η_{e_base}
- Efficiency Bonus E
  - Initially: formula goes to infinity as η_{e_ref} goes to 1
  - Change: formula revised per comments by Prof. Dr. Heinrich Huber
- Minimum Requirements on $SFP_{int-limit}$ if $q_{nom} \geq 2$ m³/s for BVUs with run-around HRS
  - Initially: coefficients too large, result in atypical $SFP_{int-limit}$ for such BVUs
  - Change: coefficients revised per comments by Prof. Dr. Christoph Kaup

ICF

The proposed “new approach” (known & unknown place of installation)

The base BVU energy recovery efficiency η_{e_base} requirements are:

For outdoor design temperatures t_{ODA} below and up to -14 °C:

73 %

For outdoor design temperatures t_{ODA} between -14 and 2.5 °C:

$-1.02 * t_{ODA} - 0.058 * t_{ODA}^2 - 0.00134 * t_{ODA}^3 + 66.44$ %

For outdoor design temperatures t_{ODA} from and above 2.5 °C:

63.5 %

Minimum η_{e_nrvu} requirements for different HRS types are:

~~For BVU with run-around HRS the temperature efficiency η_{e_nrvu} is:~~

~~η_{e_base} – 5 % points~~

For BVU with moisture HRS the calculated energy efficiency η_{e_nrvu} is:

η_{e_base} + 2 % points

For BVU with other HRS the temperature efficiency η_{e_nrvu} is:

η_{e_base} %

The basic specific fan power of an HRS (SFP_{HRS_base}) is:

For outdoor design temperatures t_{ODA} below and up to -14 °C:

388

For outdoor design temperatures t_{ODA} between -14 and 2.5 °C:

$-15.42 * t_{ODA} - 0.907 * t_{ODA}^2 - 0.0323 * t_{ODA}^3 + 261$

For outdoor design temperatures t_{ODA} from and above 2.5 °C:

216

The required value for the BVU consists of SFP_{HRS_base}, a bonus factor based on the required efficiency (E), and an additional fixed value which is proposed to be altered for different tiers and the additional amounts for the filters.

Requirements for different HRS types in the calculation of the correction factor (E) are:

~~For BVU with run-around HRS the reference efficiency ne_ref is:~~

~~ne_base – 5 % points~~

~~For BVU with BVU moisture and other HRS~~ the reference efficiency ne_ref is:

ne_base %

~~E = ne_act /(1 - ne_act) * 1/ ne_ref * (1 – ne_ref)~~ $E = 1 + 3\ (\eta_{e\_act} - \eta_{e\_ref}) / \eta_{e\_ref}$

ne_act is the energy efficiency that is built in the specific ventilation unit.

Requirements for $SFP_{int\text{-}limit}$ (W/(m³/s)):

For BVU with run-around HRS:

A x C x (~~840~~ 495 – 140 * qnom + E * SFPHRS_base + Fsup + Fexh) if qnom < 2 m³/s

A x C x (~~560~~ 215 + E * SFPHRS_base + Fsup + Fexh) if qnom ≥ 2 m³/s

For BVU with other HRS the additional value $SFP_{int,\ HRS,\ add}$ is:

A x C x (375 – 140 * qnom + E * SFPHRS_base + Fsup + Fexh) if qnom < 2 m³/s

A x C x (95 + E * SFPHRS_base + Fsup + Fexh) if qnom ≥ 2 m³/s

Where:

A - is an adjustment factor equal to 0.83 to ensure that for a unit equipped with all smart control options (C = 1.15 x 1.1) the SPFint-limit value is approximately the same as the current ErP2018 limit. For units without smart controls (C = 1), the SPFint-limit is approximately 25% lower compared to ErP2018 requirements.

C - is the control bonus

F_{sup} - is the sum of F factors for all filtration stages (if applicable) in the supply air stream according to table 5 of Annex VII

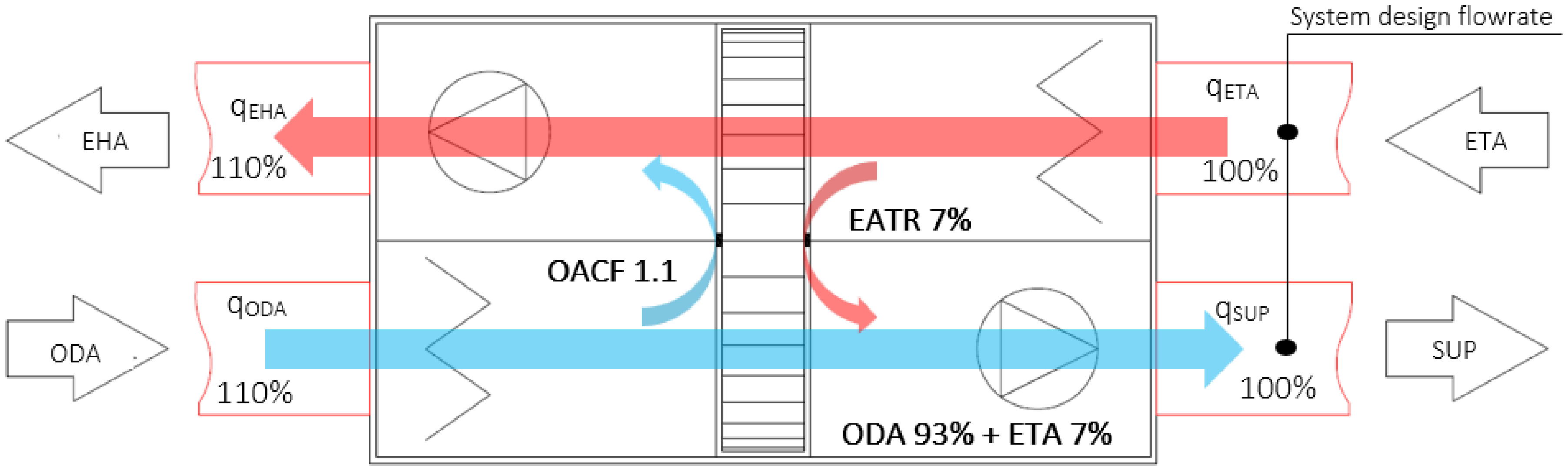
F_{exh} - is the sum of F factors for all filtration stages (if applicable) in the exhaust air stream according to table 5 of Annex VII”

Recommendation

- Accept the new approach in the draft proposal
- Accept Eurovent's suggested changes to the draft proposal's formulas
- Accept EVIA's suggested changes to the above

Updated Eurovent proposal for requirements to limit internal leakage in non-residential ventilation units

- OACF (outdoor air to exhaust air leakage) and EATR (extract air to supply air leakage) currently do not impact SFP_{int} calculation, even though in reality they can have a significant impact
- PP – 2024-12-10: include effect of OACF on SFP_{int} calculation



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Eurovent proposal for including the effect of OACF on SFP_{int}

- **What are the benefits of this new approach compared to the existing regulation?**
- **What are the drawbacks (if any)?**

- Benefits:
  - Proposal would discourage internal leakages within NRVUs and thus potentially eliminate or discourage less efficient products
- Drawbacks:
  - Currently there is no CEN standard for testing SFP_{int} with OACF leakage, but Eurovent is about to launch new work item on the subject
    - Before this can be included as a revision to the VU regulation, this work should be completed
  - Some of the proposal's specifications, such as the flowrate which would correspond to rotor diameters below 1 meter, still have to be defined; this would also need to be completed before the proposal can be considered

Recommendation

- No changes, as proposal's testing methods and specifications still need further clarification and definition

Eurovent proposal for a method on the Energy Consump. Eval of Air Filters

- **What are the savings associated with the evaluation of Energy Consumption of air-filters?**
- **Is this proposal feasible, needed and relevant?**

- Manufacturer incentivisation to design filters with lower pressure drops - lower energy consumption across their lifetime
- Changes in the filter loading over time - impacts both the energy consumed by the fan motor and the reduction in clean air delivered to the space
- Appears feasible, needed and relevant:
  - Specified in detail
  - Energy saving potential
  - Provides more precise, realistic data

Eurovent proposal for a method on the Energy Consump. Eval of Air Filters

- **What are the drawbacks (if any) of the proposed evaluation?**

- Drawbacks:
  - Stakeholder claim that manufacturers lack testing equipment
  - Risk that time-based method would not be chosen if optional
- However:
  - Proposal already in use by Eurovent clients of filter manufacturers
  - Represent majority of the EU market
  - Making the time-based approach mandatory would solve the market surveillance issue

Recommendation

- Replace the ‘Reference Test Method / Title’ of ‘Eurovent Industry Recommendation 4/21 – 2019’ with ‘Eurovent Industry Recommendation 4/25 – 2023’
- Authorities to support manufacturers with testing resources needed

MATERIAL EFFICIENCY REQUIREMENTS

Circular economy requirements proposed at the 2021 consultation Forum.

(a) Availability of spare parts: Manufacturers, importers or authorised representatives of NRVUs shall make available to the customer a list of spare parts and the procedure for ordering them, for a minimum period of 7 years after placing the unit on the market

(b) Access to repair and maintenance information

(c) Maximum delivery time of spare parts

Disassembly requirements – Regulation 2023/1670 on smartphones and tablets

(a) battery replacement (……..UNLESS DURABLE):

- Fasteners and connectors: Reusable (Class A)
- Tools: Feasible with the use of no tool, or a tool or set of tools that is supplied with the product or spare part, or basic tools as listed in Table A.3 of EN 45554 (Class A)
- Working environment: Use environment (Class A)
- Skill level: Layman (Class A)

(b) display assembly criteria:

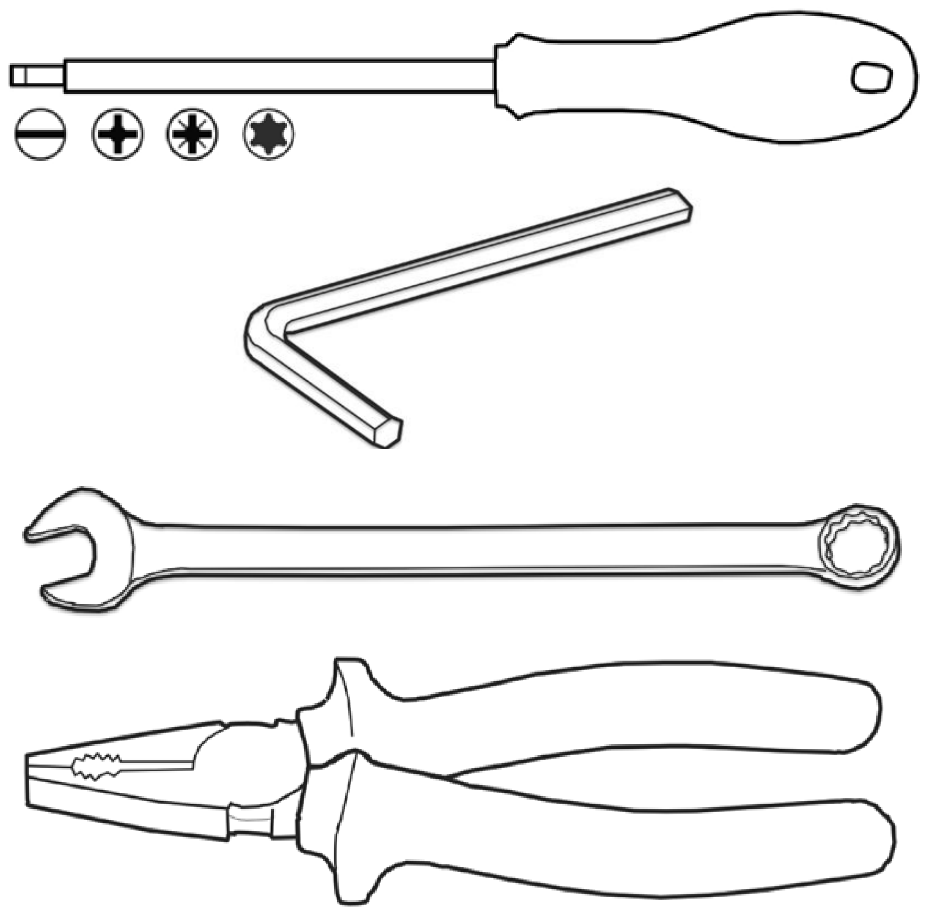
- Fasteners and connectors: Removable (Class B)
- Tools: Feasible with commercially available tools (Class C)
- Working environment: Workshop environment (Class B)
- Skill level: Generalist (Class B)

Disassembly requirements

Basic tools

Category Description	Class
Feasible with: — the use of no tool, or — a tool or set of tools that is supplied with the product or spare part, or — basic tools as listed in Table A.3	A
Feasible with product group specific tools	B
Feasible with other commercially available tools	C
Feasible with proprietary tools	D
Not feasible with any existing tool	E

> basic tools as listed in Table A.3 of EN 45554, examples:



Disassembly requirements

Working environment

> Classification according to EN 45554:

- **Use environment (Class A):** If a repair, reuse or upgrade process can be carried out in the environment where the product is in use without any working environment requirements
- **Workshop environment (Class B):** If a repair, reuse or upgrade process cannot be carried out in the environment where the product is in use (class A) but does not require a production-equivalent environment
- **Production-equivalent environment (Class C):** If a repair, reuse or upgrade process can only be carried out in an environment that is comparable with the environment in which the product was manufactured

Disassembly requirements

Skill level

> Classification according to EN 45554:

- **Layman (Class A)**: person without any specific repair, reuse or upgrade experience or related qualifications
- **Generalist (Class B):** repair, reuse or upgrade process cannot be carried out by layman (class A) but can be carried out by a person with a general knowledge of basic repair, reuse or upgrade techniques and safety precautions
- **Expert (Class C):** person with specific training and/or experience related to the product category concerned

Disassembly requirements

Fasteners

- '**fastener**' means a hardware device or substance that mechanically, magnetically or by other means connects or fixes two or more objects, parts or pieces. A hardware device which in addition serves an electrical function shall also be considered a fastener;
- '**removable fastener**' means a fastener that is not a reusable fastener, but whose removal does not damage the product, or leave residue, which precludes reassembly;
- '**resupplied fastener**' means a removable fastener that is supplied at no additional cost with the spare part which it is intended to connect or fix; adhesives shall be considered resupplied fasteners if they are supplied with the spare part in a quantity that is sufficient for the reassembly, at no additional cost;
- '**reusable fastener**' means a fastener that can be completely reused in the reassembly for the same purpose and that does no damage either to the product or to the fastener itself during the disassembly or reassembly process in a way that makes their multiple reuse impossible;

Mat. Eff. proposal

Using a similar (but tailed) approach of the smartphones Regulation, for this review, for some spare parts, when they are proprietary and specificaly designed components :

- **Filters (for RVUs and NRVUs);**
- **Sensors (for RVUs);**
- **Ventilation controls (for RVUs);**
- **Info on technical characteristics of motors (NRVUs)**

Disassemblability requirements:

- by a class B generalist,

- use environment

- using tools from A or B nomenclature (except for filters of RVUs, also C possible)

- removable/resupplied/reusable fasteners

European Commission

Overview of the proposed requirements for repair and reuse

- Availability of spare parts for a minimum time (8 years as of end of placement on the market)
- Access to repair and maintenance information
- Maximum delivery time of spare parts
- Information on the price of spare parts

Further Items to be Analysed

Industrial Fans

- **Interplay / synergy with the review of the Ecodesign Regulation 327/2011 on Industrial Fans**

- EU327 vs. EU1253:
  - Clarification needed as to whether box and rooftop fans are considered ‘axial or centrifugal fans only equipped with a housing’, or ‘ventilation units’
- AMCA feedback:
  - Roof and box fans already regulated by EU327, hence would be double-regulated
  - If such were considered ‘axial or centrifugal fans only equipped with housing,’ they would be exempt from EU1253
- EVIA feedback:
  - Favour the shift of box and roof fans to EU327
  - ‘Clear and unequivocal’ exclusion from EU1253
  - Clarify by including definitions proposed in EU327’s guidance document for calculating fan energy efficiency

Recommendation

- No changes to the regulation – the scopes of the two regulations are distinct and therefore not redundant

Phase 2.1 – Impact Assessment

Evaluation Phase

Evaluation Phase

- The evaluation phase assesses how the existing Ecodesign (Reg. 1253/2014) and Energy Labelling (Reg. 1254/2014) Regulations have performed since they entered into force in 2014.
- It involves examining what has worked well, what has not worked as intended, and the underlying reasons why.
- The evaluation is centred around five EU Better Regulation evaluation criteria:
  - Effectiveness
  - Efficiency
  - Relevance
  - Coherence
  - EU added value

Evaluation Phase – Discussion

Effectiveness

- How effective have the Ecodesign and Energy Labelling Regulations been in achieving or progressing towards their specific objectives?
- Have they encouraged manufacturers to improve the energy efficiency of their products?
- Have they helped end-users identify products with a better energy efficiency rating and resulted in more energy efficient products being purchased and installed?
- Were any requirements particularly difficult to comply with?

Efficiency

- How costly were the two Regulations to implement, considering both one-off and ongoing costs?
- Which provisions or parts of the Regulations were most costly to implement and why?
- Did costs fall disproportionately on any specific groups (e.g. SMEs)?
- Have the Regulations had any benefits for your members?

Evaluation Phase – Discussion

Relevance

- Do the problems addressed by the Ecodesign and Energy Labelling Regulations still require intervention at an EU level?
- Is the market ready for tighter requirements?
- Have any developments rendered any parts of the Regulations out-of-date or obsolete?

Coherence

- Do any provisions or parts of the two Regulations lack coherence (e.g. overlaps, inconsistencies, gaps)?
- Are the Regulations coherent with other EU policy and legislation with similar objectives?

Impact Assessment Phase

Impact Assessment Phase

- The impact assessment (IA) phase is exploring how the Ecodesign and Energy Labelling Regulations could be improved through a possible future revision.
- It is considering the impacts of four scenarios, possibly across a 40-year time horizon (2025-2065).

Business as usual	• No further EU action. Current ventilation regulations remain in force.
ECO 1	• Ventilation regulations are revised in a way (very) close to the formulation and stringency level of the requirements explained earlier
ECO 2	• Ventilation regulations are revised with a stringency level significantly higher than the requirements under ECO1
ECO 3	• Ventilation regulation are revised in a way (very) close to the formulation and stringency level of the requirements presented at the Consultation Forum Meeting of March 2021.

IA – Impact categories

- The following impact categories will be explored through the impact assessment:

- **Environmental impacts:**
  - Energy consumption (direct energy consumption and space heating energy demand)
  - Abiotic resource depletion (manufacturing and maintenance/repair)
  - Waste production and recycling (end-of-life)
- **Social impacts:**
  - Employment
  - Consumer choice and prices
  - Health (indoor air quality)
  - Social cost of GHG emissions
- **Economic impacts:**
  - One-off and on-going costs for industry (administrative burden, compliance cost, etc.)
- **Other impacts:**
  - Innovation, competitiveness (e.g., of SMEs), trade

Environmental Impacts

IA – Energy Consumption

- How would each scenario impact the energy consumption of RVUs and NRVUs?

BAU Scenario - MWh electricity consumed per unit (direct consumption only)

	2025	2030	2035	2040	2045	2050
R-UVU ≤ 100 m3/h for Extract Spaces						
R-UVU ≤ 100 m3/h for Habitable Spaces						
R-BVU ≤ 100 m3/h for Habitable Spaces	0.07	0.07	0.07	0.07	0.07	0.07
R-UVU 100-250 m3/h	0.11	0.10	0.10	0.10	0.10	0.10
R-BVU 100-250 m3/h	0.18	0.20	0.20	0.20	0.17	0.19
R-UVU 250-1000 m3/h	0.57	0.51	0.48	0.47	0.47	0.47
R-BVU 250-1000 m3/h	1.09	1.04	1.03	1.03	1.01	1.01
R-UVU > 1000 m3/h	1.42	0.70	0.69	0.70	0.71	0.74
R-BVU 1000-2500 m3/h	2.94	3.70	3.16	2.78	3.28	2.94
RVU, Total residential	0.29	0.25	0.23	0.23	0.22	0.21
NR-UVU 250-1000 m3/h	0.58	0.50	0.47	0.47	0.48	0.46
NR-BVU 250-1000 m3/h	1.13	1.07	1.02	1.02	1.02	0.99
NR-UVU > 1000 m3/h	0.54	0.45	0.46	0.45	0.46	0.40
NR-BVU 1000-2500 m3/h	1.75	1.74	1.61	1.60	1.60	1.59
NR-AHU-S 2500-5500 m3/h	4.20	4.01	3.86	3.88	3.83	3.80
NR-AHU-M 5500-14500 m3/h	13.52	12.95	12.63	12.51	12.46	12.38
NR-AHU-L > 14500 m3/h	43.55	40.77	39.71	40.14	39.60	38.96
NRVU, Total non-residential	3.82	3.64	3.50	3.47	3.47	3.48

Data based on DG ENER Ecodesign Impact Accounting, Status Report 2023

Electricity consumption per unit = Total electricity consumption for EU-27 VU stock / Total VU stock

IA – Energy Consumption

Assumed change in electricity demand in each scenario (direct consumption)

	ECO1	ECO2	ECO3
R-UVU ≤ 100 m3/h for Extract Spaces	2%-5%	5%-15%	10%-20%
R-UVU ≤ 100 m3/h for Habitable Spaces	2%-5%	5%-15%	10%-20%
R-BVU ≤ 100 m3/h for Habitable Spaces	2%-5%	5%-15%	10%-20%
R-UVU 100-250 m3/h	2%-5%	5%-15%	10%-20%
R-BVU 100-250 m3/h	2%-5%	5%-15%	10%-20%
R-UVU 250-1000 m3/h	2%-5%	5%-15%	10%-20%
R-BVU 250-1000 m3/h	2%-5%	5%-15%	10%-20%
R-UVU > 1000 m3/h	2%-5%	5%-15%	10%-20%
R-BVU 1000-2500 m3/h	2%-5%	5%-15%	10%-20%
RVU, Total residential			
NR-UVU 250-1000 m3/h	5%-10%	5%-15%	10%-20%
NR-BVU 250-1000 m3/h	5%-10%	5%-15%	10%-20%
NR-UVU > 1000 m3/h	5%-10%	5%-15%	10%-20%
NR-BVU 1000-2500 m3/h	5%-10%	5%-15%	10%-20%
NR-AHU-S 2500-5500 m3/h	5%-10%	5%-15%	10%-20%
NR-AHU-M 5500-14500 m3/h	5%-10%	5%-15%	10%-20%
NR-AHU-L > 14500 m3/h	5%-10%	5%-15%	10%-20%
NRVU, Total non-residential			

We assume the scenarios would not impact space heating energy demand (indirect consumption)

- 5–10% assumption for ECO1 NRVUs based on ~5% increase to NRVU thermal efficiency requirements (less for RVUs)
- ECO2 range assumes a 5% increase in maximum potential energy savings over ECO1 due to more stringent requirements
- ECO3 range assumes a further 5% increase over ECO2 due to stringency of Consultation Forum Meeting proposals

IA – Abiotic resource depletion

- How would material consumption change in each scenario?

BAU – Material consumption per unit manufactured [g/unit]

		Bulk plastic		Tec plastic	Ferro metals		Non-ferro metals			Electronics
		PP	ABS	Epoxy	St sheet galv	Ferrite	Al diecast	CU winding wire	CuZn38 cast	Controller board
Residential ventilation units	R-UVU ≤ 100 m3/h for Extract Spaces	10	316	177	454	0	0	20	0	10
	R-UVU ≤ 100 m3/h for Habitable Spaces	10	316	177	454	0	0	20	0	10
	R-BVU ≤ 100 m3/h for Habitable Spaces	0	1792	104	1305	70	35	139	35	0
	R-UVU 100-250 m3/h	371	1160	278	1346	0	1114	278	0	93
	R-BVU 100-250 m3/h	612	1072	459	3062	0	1837	459	0	153
	R-UVU 250-1000 m3/h	310	0	0	16411	1548	10218	1858	0	619
	R-BVU 250-1000 m3/h	615	0	0	30145	3076	22147	4306	0	1230
	R-UVU > 1000 m3/h	491	7432	1321	7036	908	661	1652	0	500
	R-BVU 1000-2500 m3/h	3677	31505	6691	132154	4461	11710	5019	0	784
Non-residential ventilation units	NR-UVU 250-1000 m3/h	310	0	0	16411	1548	10218	1858	0	619
	NR-BVU 250-1000 m3/h	615	0	0	30145	3076	22147	4306	0	1230
	NR-UVU > 1000 m3/h	491	7432	1321	7036	908	661	1652	0	500
	NR-BVU 1000-2500 m3/h	3677	31505	6691	132154	4461	11710	5019	0	784
	NR-AHU-S 2500-5500 m3/h	10039	9324	1702	593184	0	63936	58460	2368	987
	NR-AHU-M 5500-14500 m3/h	22033	19883	3629	1264925	0	136339	124662	5050	1479
	NR-AHU-L > 14500 m3/h	74391	64575	11788	4108200	0	442800	404875	16400	1971

Data source: DG ENER Ecodesign Impact Accounting, Material Content and Environmental Impacts Report (2023)

ICF

IA – Service life, maintenance and repair

- How would the scenarios impact the service life, maintenance and repair of VUs?

We assume that:
- The average product life of a VU is 17 years.
- 2% of the material used for manufacturing a VU is used for each repair
- The number of years between each repair is as follows:

	Years between visits
UVU/100/ES	10
UVU/100/HS	10
BVU/100/HS	9
UVU/250	5
BVU/250	5
UVU/1000	3
BVU/1000	3
UVU/>1000	2
BVU/2500	2
AHU-S	1
AHU-M	1
AHU-L	1

IA - Material Prices

- What are the average market prices of these materials and how might these change in the years to come?
- Please confirm if estimations below reflect market prices

Assumed market prices (EUR)	Bulk plastic				Tec plastic		Ferro metals				Non-ferro metals						Electronics	
	PP		ABS		Epoxy		St sheet galv		Ferrite		Al diecast		CU winding wire		CuZn38 cast		Controller board	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Price per tonne (EUR)	1300	1500	2200	2400	17000	25000	720	910	1000	1500	2.3	2.6	5.65	6.15	4.35	4.37	80	20
Price per kg (EUR)	1.30	1.50	2.20	2.40	17	25	0.72	0.91	1.00	1.50	2300	2,600	5650	6150	4350	4370	80000	2,000

Social Impacts

IA – Industry revenue and employment

- Total employment in the sector can be estimated based on the total sector revenue and average sector revenue per employee.
- DG ENER's (2023) Ecodesign Impact Accounting Status Report provides 'business as usual' data on sector revenue, average revenue per employee, and total employment:

Sector revenue (€m)

	2020	2030
Industry	7,260	8,293
Wholesale	1,043	1,380
Retail	1,057	1,415
Installation	9,626	10,164
Maintenance	2,267	3,136
Total revenue	**21,253**	**24,388**

Revenue per employee (€m)

	2020
Industry	0.057
Wholesale	0.286
Retail	0.069
Installation	0.114
Maintenance	0.114

Total employment

	2020	2030
Industry	127,368	145,491
Wholesale	3,647	4,825
Retail	15,319	20,507
Installation	84,439	89,158
Maintenance	19,886	27,509
Total employment	**250,659**	**287,490**

- How would total sector revenue and employment change in each scenario?
- How might the scenarios impact the share of employment in SMEs?

IA – End-user prices

- How would each of the scenarios impact the unit prices of RVUs/NRVUs, and to what extent would any costs be passed through to end-users?

Unit purchase prices, including VAT but excluding installation (€ 2020)							
	2020	2025	2030	2035	2040	2045	2050
RVU, residential ventilation units							
R-UVU ≤ 100 m3/h for Extract Spaces	234	224	214	204	196	187	179
R-UVU ≤ 100 m3/h for Habitable Spaces	234	225	217	208	200	193	186
R-BVU ≤ 100 m3/h for Habitable Spaces	594	570	546	537	537	537	537
R-UVU 100-250 m3/h	617	605	593	581	569	557	546
R-BVU 100-250 m3/h	1,757	1,706	1,657	1,624	1,624	1,624	1,624
R-UVU 250-1000 m3/h	469	466	463	469	474	479	483
R-BVU 250-1000 m3/h	2,166	2,108	2,108	2,108	2,108	2,108	2,108
R-UVU > 1000 m3/h	885	878	872	875	878	881	883
R-BVU 1000-2500 m3/h	5,905	5,799	5,788	5,788	5,788	5,788	5,788
NRVU, non-residential ventilation units							
NR-UVU 250-1000 m3/h	391	388	386	391	395	399	403
NR-BVU 250-1000 m3/h	1,805	1,757	1,757	1,757	1,757	1,757	1,757
NR-UVU > 1000 m3/h	738	732	726	729	732	734	736
NR-BVU 1000-2500 m3/h	4,921	4,833	4,824	4,824	4,824	4,824	4,824
NR-AHU-S 2500-5500 m3/h	11,497	11,298	11,102	10,921	10,743	10,567	10,394
NR-AHU-M 5500-14500 m3/h	15,931	15,659	15,392	15,150	14,911	14,676	14,444
NR-AHU-L > 14500 m3/h	31,216	30,668	30,130	29,627	29,133	28,646	28,168

DG ENER (2023) Ecodesign Impact Accounting Status Report

Economic Impacts

IA – Implementation costs and other impacts

- How much would each of the scenarios cost an 'average' business to implement, considering both one-off and on-going costs (e.g. cost of inputs, capital, labour, reporting, production, distribution, etc)?
- Which types of businesses would face higher/lower costs and why?
- Would the scenarios impact businesses' ability to innovate and conduct R&D?
- Would they impact the competitiveness of business (e.g. SMEs) or intra/extra EU trade?

Comments, Feedback & Next Steps

Thank you

for your participation

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