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
- Study Objectives, Scope and Schedule
- Items for Review, concerning:
  - Residential Ventilation Units
  - Non-residential Ventilation Units
  - Further Items to be Analysed
- Comments & Feedback
- AOB

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

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 **aim** 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.

*These requirements of the Phase 1.1 Technical Analysis from the EC are included as questions / prompts in the proceeding slides.

Schedule

✓Drafting of Phase 1.1 Technical Analysis

✓Stakeholder consultation meeting

❑Receipt of stakeholder comments (29th July) and updating Phase 1.1 as appropriate

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

❑Kick-off of Phase 2.1 Impact Assessment (*indicatively* September)

Study ends *indicatively* June 2025

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

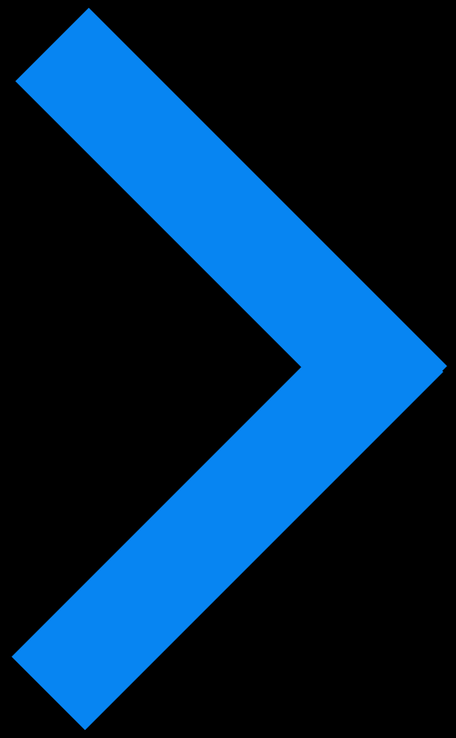
Product Label vs. System Label

- **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?**
- **In case of unfairness, can it be solved with different SEC formulations?**

- Feasible, potentially relevant
- Dependent on stakeholder input
- Same fundamental ventilation functions of BVUs and UVUSs
- 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
- Unfairness:
  - Solve by including a total energy recovery ratio constant to the SEC formula of 50%
  - Due to 50% of air moving through a UVU being ‘new air’

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.
- Only a portion – 50% - of the air moving through the UVU is 'new air' to be counted in the conditioned air cost calculation.

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

Recommendation

- No split
- Allow for single comparative label because BVUs and UVUs are not always interchangeable
- SEC – Addition of a total recovery ratio constant of 50% for n_e for UVUs to address the issue of infiltration offset

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.

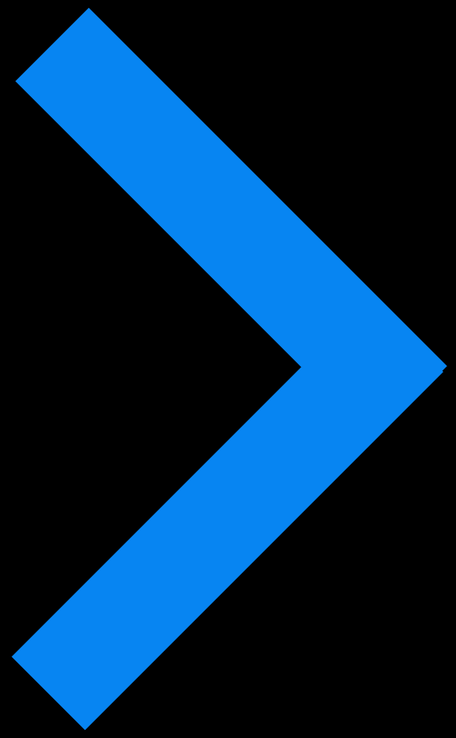
Recommendation

- 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

Calculation of the Ventilation Performance Index

- **Which would be the parameters to take into account for the calc of this index?**
- **How close is the value of the proposed index to "real life" conditions?**

- CTRL factor the only approach for improving the VPI in the draft proposal
- Calculations of VPI generally follow trends that are true in 'real life' conditions:
  - BVUs achieve a higher VPI than UVUs
  - More control means a higher VPI
  - More precise control means a higher VPI
- Assuming products are properly installed, the VPI accurately depicts trends and benefits of the various products and control strategies
- Stakeholder views:
  - VPI factor not 'mature' enough to be used
  - Cannot be accurately used to reflect installed performance
  - Unnecessarily complicates the SEC calculation



Recommendation

- VPI not to be included on the label
- Remove all references to the VPI metric in the draft proposed regulation

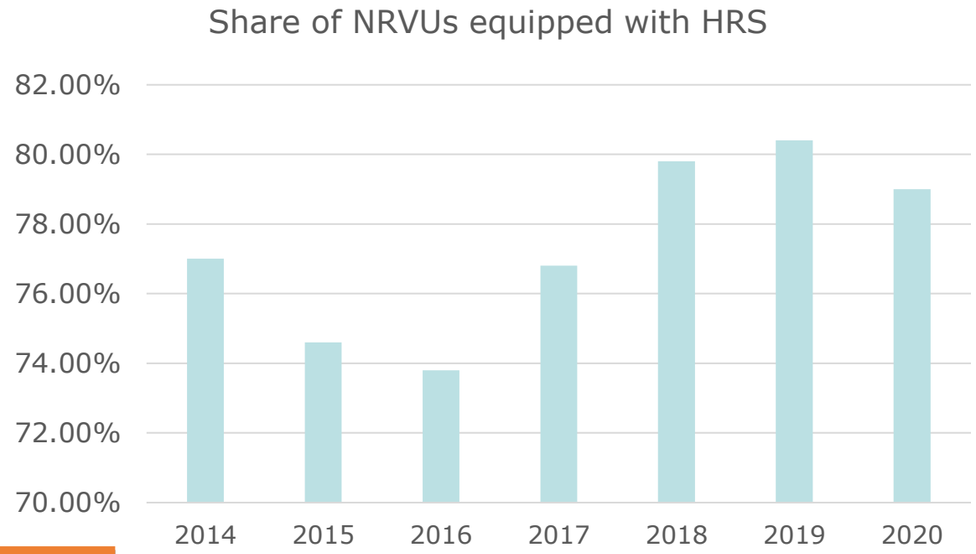
Concerning non-residential ventilation units

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%

‘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.~~

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

FEEDBACK NEEDED ON FEASIBILITY OF MARKET SURVEILLANCE!!

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)

The base BVU energy recovery efficiency $\eta_{e,base}$ 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 $\eta_{e,nrvu}$ requirements for different HRS types are:

For BVU with run-around HRS the temperature efficiency $\eta_{e,nrvu}$ is:

$\eta_{e,base}$ - 5 % points

For BVU with moisture HRS the calculated energy efficiency $\eta_{e,nrvu}$ is:

$\eta_{e,base}$ + 2 % points

For BVU with other HRS the temperature efficiency $\eta_{e,nrvu}$ is:

$\eta_{e,base}$ %

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)

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

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

For BVU with run-around HRS:

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

A x C x (560 + 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

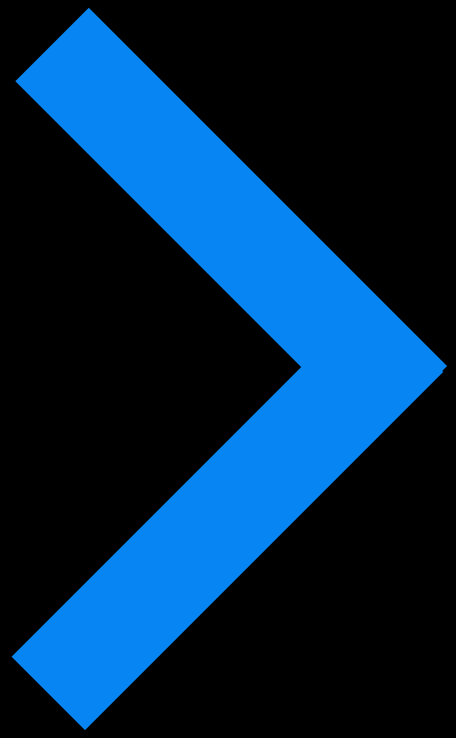
Where:

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

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

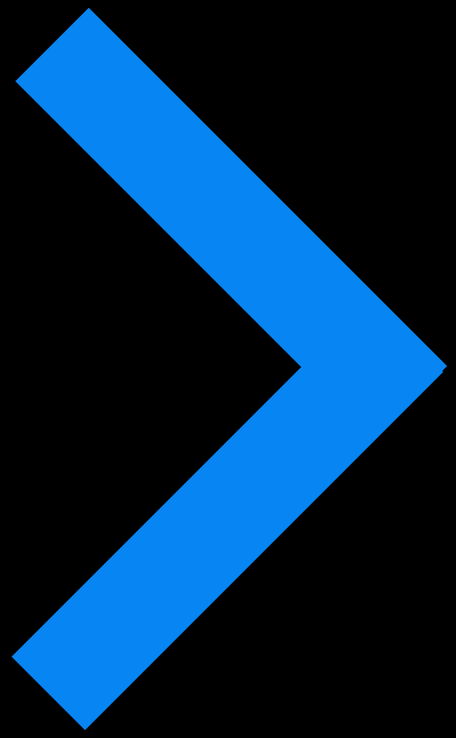
- Replace the ‘Reference Test Method / Title’ of ‘Eurovent Industry Recommendation 4/21 – 2019’ with ‘Eurovent Industry Recommendation 4/25 – 2023’
- Authorities to support manufacturers with testing resources needed

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

Energy Performance of Buildings Directive

- **Interplay / synergy with the revision of the Directive on the Energy Performance of Buildings**

- Revised EPBD adopted in April 2024
- Ventilation systems added to list of measures that national Member State inspectors should cover
- Aimed at addressing the quality of indoor air
- Compare sizing of the ventilation system to requirements of the building
- Optimise its performance
- 2030 – mandatory to equip new/renovated residential buildings with monitoring/control functionalities – exempt from inspections
- Supports high indoor environmental standards

Recommendation

- EPBD to be used as an inspection tool to verify the Ecodesign Regulation, especially for NRVUs
- EPBD to consider NRVU requirements and include in their inspection schemes
- Pertaining to the EPBD, no changes needed to the regulation

Comments & Feedback

Responses are due by:

Friday 29th July to:
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Thank you

for your participation

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