

REHVA position on the Smart Readiness Indicator (SRI) methodology

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REHVA greatly acknowledges the inclusion of a Smart Readiness Indicator in the revised EPBD and the starting of the development of SRI methodology with the aim to interconnect buildings in an intelligent and effective way to smart grids. There are many positive features in the ongoing preparatory study seen, including the adaptation to the needs of occupant, promotion of health and good indoor environmental quality as well as the ability to match the requirements with the actual grid capability. However, REHVA is strongly concerned that the proposed multi-criteria decision-making method based on 10 domains and impact scoring in 8 categories is not capable to measure the building performance. The proposed methodology is too complex, far from the simplicity requirement of the Directive. Moreover, it is qualitative and therefore too subjective to be transparent and easy to understand by consumers.

A qualitative methodology is subjective, non-transparent and not future-proof

A major problem of the proposed qualitative method is that the scoring is based on the installed technical features, which is not technology neutral and does not necessarily add up to better performance. The proposed summing of sub-services functionality levels may be compared to energy performance assessment being based on qualitative description of energy saving measures - the more measures are applied in the building the better is the achieved energy performance. As it is well-known, such a method does not allow the assessment of the energy performance, as this is measured with the primary energy indicator - a performance-based indicator to calculate or to measure, and it can be assumed that the same will apply to SRI. The list of the included technical features is problematic, because it is not technology neutral and fails to consider that the technical solutions are dependent on specific climate and local building tradition, thus they are not universal across Europe. On the other hand, the methodology must be open for emerging technologies to be future-proof during the years in use. The list of technical features will be quickly outdated, therefore instead of a taxonomy of technologies, the SRI shall be based on measurable performance criteria.

Keep it simple. A complicated, non-transparent SRI bears a risk for consumers and the market

A complicated, not measurement-based SRI bears a high risk that it won't serve the actual improvement of buildings performance, but rather create an industry hype using the so called "smart readiness" as a marketing tool, whilst delivering no productive improvement, thus misleading consumers. This is clearly against the approach of the Clean energy package and the Energy Union, which put the consumer in the focus of the energy transition. The SRI should start with focusing on the things we know that we know and evolve from there as the market gains understanding and confidence.

Adaptation to user needs and adaptation to the grid can't be assessed with the same indicator

Another problem of the proposed SRI methodology is that it has a too broad scope compared to the requirements defined in the recently approved EPBD recast (2016/0381 (COD)) for such an indicator. The Directive is not asking for a new “sustainability” or “global performance” indicator, like LEED, BREEAM, etc., but for “an assessment of the capabilities of a building or building unit to adapt its operation to the needs of the occupant and the grid and to improve its energy efficiency and overall performance. Three key functionalities of SRI are specified in EPBD Annex 1A: “(a) Adaption of energy consumption to more renewable sources; (b) Adaptation in response to user needs; (c) Flexibility of electricity demand in relation to the grid”. In this context, it is important to understand that the adaptation to user needs refers to the need to maintain good indoor air quality and comfort, i.e. demand response cannot lead to the situation where ventilation and other services will be switched off or operated in a way which deteriorates indoor climate during occupancy in the building. Thus, following the indoor climate criteria specification during occupancy, occupant satisfaction is a precondition for demand response and load shifting measures. With these preconditions, the core scope of the SRI should focus on measuring the load matching performance in a simple and meaningful fashion.

Drawing a parallel to the energy performance calculation: the primary energy indicator is limited to primary energy only and doesn't provide information about functionality, indoor air quality and comfort, or the carbon footprint of the building - because these very different aspects can't be combined to a single indicator. However, when calculating the primary energy indicator, indoor air quality and comfort criteria are considered. The same should apply for the SRI calculation. For example, demand-controlled HVAC&BAC systems are not accounted as a score based on the installed technology features, but they improve the primary energy indicator through their actual energy performance impacts. This should be the case for the SRI calculation too. The SRI should be the starting point, like the primary energy indicator, and focus on the load matching. Proposing this limitation of the scope, REHVA stresses that neither the energy performance calculation, nor the SRI assessment methodology should be implemented on the cost of indoor comfort. This issue has been addressed in the revised EPBD but needs to be strengthened and monitored in the implementation phase at MS level.

The SRI core focus shall be to measure how much the building services systems are able to match the occupants needs with the grid needs in the most effective way. Adaptation to occupant needs is measured with indoor air quality and comfort, occupant satisfaction, health, wellbeing and productivity, which are all highly important goals, but shall be measured with completely different parameters than demand response of load shifting. Annex I of the revised EPBD mentions that indoor air quality and comfort levels should be defined by Member States. If it is suspected that SRI can compromise indoor air quality and comfort, an additional indoor climate criteria specification shall be set up - i.e. a set of indoor air quality, ventilation and thermal comfort indicators -to ensure that the SRI measures will serve the purpose.

Scientific studies define already suitable grid load and grid interaction indicators, which can be used for setting up the SRI. These include load match indexes, simple electric peak power (W/m^2) or more complicated flexibility factors measuring how much power and energy maybe shifted from high price electricity to low price electricity situation. For instance, a recent review paper lists 12 of such indicators, a common feature of all of them is that they can be calculated, simulated or measured. REHVA believes that to satisfy the original EPBD recast requirements, this existing knowledge must be used instead of the qualitative and too general approach followed in the current SRI preparatory report.

When defining the SRI, it is essential to conduct a comprehensive study to demonstrate what amount of electric power shifting and for how long smart readiness features can result if applying control, automation, storage, electric cars and other possible measures. Aggregating their potential effects on the building stock level will show the potential impacts on the grid operation. This approach is unfortunately completely missing from the preparatory study. Basically, the proposed SRI does not allow to quantify real impacts to the grid operation.

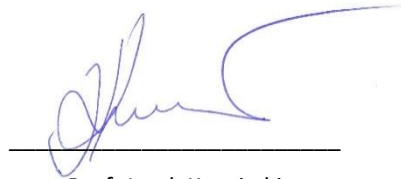
REHVA recommendations for an improved SRI calculation methodology

- To SRI shall be transparent, simple and meaningful. Therefore, REHVA recommends defining performance-based indicators that are technology neutral, future proof, and can be simulated or measured.
- The adaptation to the occupant needs and adaptation to the grid shall not be measured with the same indicator, we need two sets of criteria.
- The SRI shall focus on electric load shifting in high electricity price situations and take into account electricity self-production to enable intelligent and grid friendly design and operation of buildings. REHVA recommends extending the existing energy calculation methods for SRI calculation in a way that they are capable to provide electric power data with enough short time step resolution.
- Developing a meaningful SRI according to the revised EPBD will need more effort in the coming years. REHVA is ready to contribute to future work by setting up Smart Buildings Indicator Task Force.



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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 120.000 HVAC engineers and building professionals in Europe. REHVA is an independent professional umbrella organisation dedicated to the improvement of health, comfort and energy efficiency in all buildings and communities. REHVA encourages the development and application of both energy efficiency and renewable energy technologies.*