Alliance for
Internet of Things
Innovation

A balanced approach for implementing the Smart Readiness Indicator

Position Paper

AIOTI WG13 – Smart Buildings and Architecture

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Executive Summary

The voluntary Smart Readiness Indicator (SRI) under the Energy Performance of Buildings Directive is a welcome development. If implemented in a balanced and holistic manner, the SRI has the ability to raise awareness about the benefits of smart technologies and the uptake of new technology in the building sector. To ensure a balanced and holistic approach to the SRI framework, this paper outlines AIOTI Smart Building and Architecture Working Group's position on the main questions guiding the 2nd phase of the SRI study. Among other recommendations, AIOTI urges the SRI Study Group to consider:

- The inclusion of network readiness as a key impact criterion to address the importance of connectivity for smart systems to function smoothly.
- Ensure the SRI Is compatible with the LEVEL(S) scheme, Energy Performance Certificates, and the Broadband Cost Reduction Directive.
- Ensure the SRI framework is adaptable and accounts for the differences in building contexts, typologies and geographic locations through distinct frameworks for building types.
- For the widest use and adoption of the SRI, the framework must be flexible in assessment by ensuring the format and presentation of information is conveyed in a meaningful manner so it is easily understood.

We use this paper to open a dialog between AIOTI and the SRI Study Group on the topics highlighted in this paper.

Contents

Background

Buildings are the single largest energy consumer in Europe, absorbing 40% of final energy and producing about 36% of all greenhouse emissions[1]. There is an urgent need to tackle this issue, as across Europe, 75% of buildings are considered energy inefficient, and, depending on the Member State, only 0.4-1.2% of the stock is renovated each year.

There is a clear need to accelerate building renovation investments and leverage smart, energy-efficient technologies in the building sector across Europe. New disruptive technologies will play an essential role in helping to achieve greater energy efficiency in buildings, while interacting with the built environment, beyond control, maintenance and facilitating digital infrastructure. The information and control enabled by digitisation, including IoT devices, are helping create intelligent buildings that:

- Minimise the energy consumption and carbon impact to run assets and operations
- Optimise the performance, efficiency, and lifespan of physical assets in a cost effective way.
- Ensure the safety, security, and efficiency of people and processes, while ensuring that the inhabitant remains in ultimate control.
- Aspire to improve the working and wellness conditions of its inhabitants and users.

In the revised Energy Performance of Buildings Directive (EPBD), published on 19 June 2018, one of the focal points was to promote the deployment of smart technologies in the building sector. As such, the revised EPBD required the development of a voluntary European scheme for rating the smart readiness of buildings, the "Smart Readiness Indicator" (SRI). The SRI Is "intended to raise awareness about the benefits of smart technologies and ICT in buildings (from an energy perspective), and support the uptake of technology innovation in the building sector"[2]. The European Commission DG Energy commissioned a study to support the development of the SRI with a final report published in August 2018 titled, *Support for setting up a Smart Readiness Indicator for Buildings and related impact assessment*. The Commission embarked on the second technical support study for the establishment of SRI with a timeline of end of year 2019. The corresponding *Interim Report of the Second Technical Support Study on The Smart Readiness Indicator for Buildings* was published In July 2019.

AIOTI Working Group 13: Smart Building and Architecture welcomes the positive development of the SRI and recognises that it can be an effective tool to support the development of smart buildings, both in new construction and existing buildings. Buildings can benefit from up-to-date technology to deliver better comfort and services while improving usage, experience, sustainability, reducing carbon footprint and energy usage.

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1 European Commission: Energy Performance of Buildings

2 Final Report: Support for setting up a smart readiness indicator for buildings and related impact assessment (26 August 2018)

This paper outlines AIOTI's position on the main questions guiding the 2nd phase of the study as outlined during the stakeholder meeting held on 26 March 2019. The questions highlighted are as follow:

1. Is the consolidated SRI scheme complementary to relevant existing initiatives and schemes?
2. Does the SRI provide a fair and well-balanced representation of smart technologies while remaining technology neutral?
3. Is the SRI framework applicable to different building contexts and typologies?
4. Is the SRI scheme practically applicable in an efficient and cost-effective manner?
5. Is the format of the SRI appropriate?
6. Does the SRI adequately address interoperability, interconnectivity, and cybersecurity?
7. Is the process for consolidating/updating the SRI scores or presentation format adequate?

The position of AIOTI Working Group 13 for each of the questions are outlined below.

1. Is the consolidated SRI scheme complementary to relevant existing initiatives and schemes?

The SRI is positively complimentary to existing European Union building policy initiatives and schemes. Particularly to the mandatory Energy Performance Certificates (EPCs), the trialling of building renovation passports, and the voluntary LEVEL(S) scheme. Moving forward potential synergies between these existing initiatives, including a joint assessment process, must be considered to reduce assessment costs and streamline the process to ensure all initiatives are widely implemented and accepted by users and building owners.

Given the SRI is intended to be a voluntary measure, linking it to the assessment of mandatory measure such as EPCs would ensure it is more widely used and adopted. EPCs are mandated under EPBD to be produced and communicated to prospective purchasers and tenants whenever a building is due to change ownership or tenancy. This intervention moment, the change of ownership and tenancy, would have the greatest potential for uptake of the voluntary SRI and would ensure the score is communicated alongside the EPCs to relay all information on the smart readiness of a building.

Another consideration is the Broadband Cost Reduction Directive[3] (2014/61/EU), which is viewed as a "complementary piece of information to the SRI." Articles 8 & 9 of the Directive ensure high-speed-ready, accessible in-building physical infrastructure in all newly constructed and majorly renovated buildings (31 Dec 2016 onward) and introduce a voluntary broadband ready label at member state level. This creates a gap, as *any* building can be assessed under the SRI, and the Directive utilises a voluntary broadband ready label only for new builds/renovations.

In the 2018 Report on the implementation of the Broadband Cost Reduction Directive[4] , the Commission found that "a majority of stakeholders consider broadband-ready labels a good way of supporting the deployment and take-up of high-speed networks, but such labels have been introduced in only a few Member States so far." Given the limited adoption of the Directive, the SRI methodology cannot rely on it to ensure broadband access is accounted for when assessing buildings. For a building to score highly on the SRI and address the abovementioned gap, it is recommended that 'network readiness' (further defined in the next section) be introduced as a key impact criterion. Introducing networking readiness in the framework will ensure the connectivity needs of a building are assessed and drive the SRI score of a building.

[3] Directive 2014/61/EU of The European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks.
[4] Digital Single Market: Report on the implementation of the Broadband Cost Reduction Directive Published June 2018

2. Does the SRI provide a fair and well-balanced representation of smart technologies while remaining technology neutral?

The current smart services catalogue contains a streamline of 112 services within 10 domains. The services proposed are enabled by smart ready technologies, and are defined in a technology neutral way. The services listed describe the main expected impacts towards building users and the energy grid in a positive manner. The alignment with existing technical standards is extremely positive for the deployment of the SRI.

While the development of this catalogue of smart ready services has been developed with substantial stakeholder feedback, it misses a key criterion: network readiness. The SRI Impact Assessment highlights the importance of 'broadband access' in order for smart systems to function smoothly. However, the current catalogue does not include network readiness as a domain, rather considers it a secondary piece of information, which would not affect the SRI, score of a building. With advances in built world technology showing no signs of slowing, the smart technology requirements are rapidly becoming more complex. In this evolving world, the reliance on fast, reliable, and dependable connectivity is increasing.

By including network readiness as another domain in the service catalogue, it would provide users with transparency and enable the objective benchmarking of how well designed and connected different buildings are in the market. Connectivity is essential for the successful deployment of all smart technologies in buildings. Figure 1 outlines the possible services with functionality levels in the network readiness domain. The proposed services can be linked to most of the Impact Criteria highlighted in the SRI methodology and ultimately influence the score of a building.

Figure 1: Services with Functionality levels for the proposed Network Readiness Domain

Mobile broadband network coverage	Level 0 - No coverage indoor or outside building
	Level 1 - Outdoor coverage
	Level 2 - Shallow indoor, ground floor coverage only
	Level 3 - Deep indoor ground coverage
	Level 4 - Deep indoor floor coverage + basement coverage
Low Power, Wide Area (IoT) Coverage	Level 0 - No coverage indoor or outside building
	Level 1 - Outdoor coverage
	Level 2 - Shallow indoor, ground floor coverage only
	Level 3 - Deep indoor ground coverage
	Level 4 - Deep indoor floor coverage + basement coverage
Mobile broadband throughput & latency capability	Level 0 - No service available
	Level 1 - Data throughput up to 20 kbit/s, latency under 500m
	Level 2 - Data throughput > 20kbit/s up to 1Mbit/s, latency under 200ms
	Level 3 - Data throughput > 1Mbit/s up to 1Gbit/s, latency under 50ms
	Level 4 - Data throughput > 1Gbit/s, latency under 20ms
Fixed Access	Level 0 - No fixed access
	Level 1 - DSL to the builidng
	Level 2 - Fibre to the building
	Level 3 - Fibre to the building + ethernet internal distrubution supporting wireless small cell access
	Level 4 - Fibre to the building + fibre internal distribution supporting wireless small cell access

3. Is the SRI framework applicable to different building contexts and typologies?

The SRI is a valuable tool to support the uptake of technology innovation in the building sector. The building sector in itself is vastly diverse with different types of buildings being used in a variety of different ways. It is important to stress the difference between commercial and residential buildings, and more generally between public and private spaces. Commercial buildings use smart technologies and solutions in different manners from residential buildings, and these differences (e.g. open-sourced) need to be accounted for when determining the SRI of any particular building.

In addition, the SRI will need to pay particular attention to the privacy aspects of using or promoting the wide use of connectivity technologies given the differences between commercial and residential buildings. The current framework needs to address the privacy concerns more readily within the methodology. It is recommended separating the methodology for commercial and residential buildings by having two independent frameworks, which would account for the differences of smart technologies deployed in two distinct building contexts.

The importance of certain SRI domains will be dependent on geographical location. For instance, heating, cooling and controlled ventilation are interlinked. This is especially true for heating and cooling. For example, in Northern Europe heating may be more important than cooling, whereas in Southern Europe cooling may be more important than heating. Therefore, an approach that uses an element of energy balance would be appropriate to weight these domains towards the building type and geographical location. As an example, in member states with colder climates where cooling is infrequently installed, the services outlined under the Cooling domain should not be given equal consideration as the Heating domain.

4. Is the SRI scheme practically applicable in an efficient and cost-effective manner?

Measuring the SRI of both commercial and residential buildings should benefit from a very simple assessment process. This would mean exploring whenever possible having a joint assessment process with other initiatives and schemes to reduce costs as much as possible and making the adoption of SRI efficient and effective. There should be the option to perform self-assessment on certain types of non-complex buildings (i.e. single residential home) to ensure the SRI is widely used and adopted in all member states.

For commercial or complex residential buildings that have a number of considerations to account for, linking with other schemes for joint assessment would be both effective and efficient. By prompting the assessment at an intervention moment, such as the change of ownership and tenancy, would enable the greater uptake of the SRI.

5. Is the format of the SRI appropriate?

AIOTI WG 13 is aligned with SRI Topical Working Group B's (Calculation Methodologies) preference of option three in which the presentation had three aspects. This was in the form of a single figure, three figures corresponding to EPB criteria, and the eight impact criteria scores. This would provide the greatest flexibility in presentation to suit the needs of the reader as well as convey valuable information on the areas of improvement and assessment

6. Does the SRI adequately address interoperability, interconnectivity, and cybersecurity?

The SRI should be technology neutral and this needs to be explicit in the framework developed. However, this needs to be managed through other schemes and regulations and not the SRI methodology. This includes aligning with the EU cybersecurity certification framework[5] under the Cybersecurity Act. This alignment will harness the certification schemes that emerge, many of which are likely to be relevant to digital infrastructure in Smart Buildings.

The protection of privacy rights and the protection from cybersecurity threats must be considered when promoting the uptake of digital solutions in buildings. In order to address these concerns the SRI needs to ensure:

- A holistic approach[6] for appropriate risk-based security measures to secure and assure the ICT infrastructure for smart buildings.
- The application of the "security by design" principle[7] of integrating security conscious architecture and risk-relevant controls from the start when designing new products and services.

[5] The Commission will develop a list of ICT products, ICT services and ICT processes or categories thereof that are capable of benefiting from being included in the scope of a European cybersecurity certification scheme. The first programme shall be ready to be published in June 2020.
[6] Digital solutions should account for all reasonable threats and vulnerabilities throughout the supply chain, the means to mitigate (e.g. monitoring & access controls) and respond (e.g. patching).
[7] Example is the Consumers International Trust by Design Guidelines for consumer IoT launched in 2019.

- Common approaches for the certification of components, products or services (be they devices, connectivity, storage or applications) that provides assurance relevant to the risk and at the same time allows development of innovative solutions. This could be through European guidelines (or norms) and certification approaches that build on common standards.

7. Is the process for consolidating/updating the SRI scores or presentation format adequate?

Aggregating the different scores into an overall impact score without visibility of the individual impact criteria is not recommended. Providing an overall score may lead to a situation in which two separate buildings with different capabilities and technologies have the same score but are not comparable in any sense.

It is more important to understand and communicate how the building performs against the eight impact criteria: energy, flexibility for the grid, self-generation, comfort, convenience, wellbeing & health, maintenance & fault protection, and information to occupants. Expressing the SRI through the impact criteria will drive targeted investment decisions for continuously improving the building through its lifetime. It is encouraged that the final methodology communicates each individual impact criteria score rather than developing an overall score.

The methodology uses several mechanisms leading to the final value of the SRI score such as weighting and triage. However, the circumstances can vary depending on the building type, climate, specificities, etc. Depending on how these mechanisms are implemented, it may introduce subjectivity in the process. As an example, who would be entitled to omit or rescale elements or adapt the weighting? Consequently, the absolute value may vary from one building to another one depending on treatment of these facets during assessment. Similar to the problem of having an aggregated score, the assessed score will be specific to a singular building and linked to the chosen weighting or selection of relevant services, making it difficult to compare two buildings, even in the same area.

It seems likely that due to evolving digital developments in architecture and building, the SRI design and process of realization will need to be adapted to reflect these changes. Since there is limited information on what it means to live in a more hybrid and smart built environment it is advised to be mindful of the role of the SRI within that environment.

About AIOTI

AIOTI is the multi-stakeholder platform for stimulating IoT Innovation in Europe, bringing together small and large companies, start-ups and scale-ups, academia, policy makers and end-users and representatives of society in an end-to-end approach. We work with partners in a global context. We strive to leverage, share and promote best practices in the IoT ecosystems, be a one-stop point of information on all relevant aspects of IoT Innovation to its members while proactively addressing key issues and roadblocks for economic growth, acceptance and adoption of IoT Innovation in society.

AIOTI's contribution goes beyond technology and addresses horizontal elements across application domains, such as matchmaking and stimulating cooperation in IoT ecosystems, creating joint research roadmaps, driving convergence of standards and interoperability and defining policies. We also put them in practice in vertical application domains with societal and economic relevance.

AIOTI is a partner for the European Commission on IoT policies and stimulus programs, helping to identifying and removing obstacles and fast learning, deployment and replication of IoT Innovation in Real Scale Experimentation in Europe from a global perspective.

AIOTI is a member driven organisation with equal rights for all members, striving for a well-balanced representation from all stakeholders in IoT and recognizing the different needs and capabilities. Our members believe that we are the most relevant platform for connecting to the European IoT Innovation ecosystems in general and the best platform to find partners for Real Scale Experimentation.

AIOTI WG13 Smart Buildings and Architecture covers IoT technologies and solutions deployed in buildings and districts of buildings to improve life of the occupants by addressing and optimising elements such as comfort, light, temperature, air quality, water, nourishment, fitness, and energy usage.