First evidence from the Smart Readiness Indicator test phase in Italy for non-residential buildings

Abstract

The Smart Readiness Indicator (SRI), introduced under the Energy Performance of Buildings Directive (EPBD) III, assesses a building's capability to use smart technologies by evaluating three key functionalities: optimising energy efficiency and operational performance, adapting to occupants' needs, and interacting with the electricity grid to enable energy flexibility. Article 8 of Commission Implementing Regulation (EU) 2020/2156 allows Member States to conduct a voluntary national testing phase of the SRI. In Italy, the Ministry of the Environment and Energy Security (MASE), with technical support from ENEA, launched a 12-month national test phase in March 2025. This study reports the first results from selected case studies evaluated within this new technical framework developed by European Commission.

The assessments applied the official European SRI calculation sheet (version 4.5), using Method B for a full evaluation of 54 smart services across nine technical domains: Heating, Cooling, Domestic Hot Water, Ventilation, Lighting, Dynamic Building Envelope, Electricity, Electric Vehicle Charging, and Monitoring and Control. Seven impact criteria were considered, including energy efficiency, comfort, occupant information, and energy flexibility and storage. All domains were treated as mandatory to ensure comparability with other Member States' test phases. Case studies focused on non-residential buildings (offices, educational, and healthcare facilities) with nominal thermal power above 290 kW, equipped with medium- to high-level Building Management Systems (BMS).

Results show average SRI values of around 40% for office and educational buildings, with maximum values near 45%. Performance is mainly limited by the "Grid" key functionality, which remains low due to the absence of active grid-related services despite the technical readiness of BMSs. High scores were observed in lighting and mechanical ventilation, particularly when occupancy-based controls were used. More recent buildings, constructed after 2010, achieved higher SRI scores, highlighting the positive effect of regulatory requirements for advanced building automation and control systems. These findings suggest that future improvements will rely primarily on regulatory and market developments enabling building–grid interaction.

Introduction

The Smart Readiness Indicator (SRI), introduced under the Energy Performance of Buildings Directive (EPBD) III, measures a building's ability to use smart technologies based on three key functionalities: optimising energy efficiency and overall in-use performance, adapting their operation to the needs of the occupant, and responding to signals from the grid, such as enabling energy flexibility. Article 8 of the European Commission Implementing Regulation 2020/2156 establishes that Member States may launch a non-binding national testing phase of the SRI. Sixteen Member States have joined this phase. Based on the results of the testing phase, the European Commission will draft a report by 2026, paving the way for the adoption of new regulations on the SRI. The Ministry of the Environment and Energy Security, with technical support from ENEA's Energy Efficiency Unit Department, launched the trial of the new indicator in Italy by starting a 12-month testing phase in March 2025. In this work, the first results carried out by the assessments of SRI from selected case studies within the test phase are reported.

Methodology

In the framework of the SRI test phase in Italy, the official European calculation sheet (v.4.5) has been applied to selected case studies. In particular, Method B has been chosen for a full evaluation of the case studies: it evaluates 54 smart services across nine technical domains (Heating, Cooling, Domestic Hot Water, Ventilation, Lighting, Dynamic Building Envelope, Electricity, Electric Vehicle Charging, Monitoring and Control) against seven impact criteria (Energy Efficiency, Maintenance and Fault Prediction, Comfort, Convenience, Health, Well-being and Accessibility, Information to Occupants, Energy Flexibility, and Storage). All the technical domains have been considered mandatory, even if absent, to ensure comparability with the test phase conducted in other Member States. The SRI assessments have been conducted by ENEA experts through a review of the buildings' technical documents, on-site inspections, and consultations with the maintenance staff and technical system operators. The selection of case studies was mainly directed toward the non-residential sector (office, educational, healthcare,…) with nominal thermal power greater than 290 kW, in view of the first SRI application obligations for this segment, as provided for by EPBD IV starting in 2027. The analysis also focused on buildings equipped with medium-to-high level Building Management Systems (BMS) in order to investigate the upper limit of the SRI value.

Discussion

Focusing on non-residential buildings equipped with medium- to high-level Building Management Systems, the first results show average SRI values of around 40% for office buildings and educational buildings (i.e., university departments and schools). This percentage is mainly limited by the key functionality "Grid", which stands at around 15%. Indeed, although BMSs and their associated components are currently capable of receiving, processing, and transmitting signals from the grid, current national regulations do not yet provide for the activation, on the distributor side, of related services, such as generation flexibility and building load management based on grid inputs (e.g., Demand Side Management).

The maximum SRI achievable in these sectors is around 45%. In these cases, among the smartest technical domains, lighting shows high percentages (over 80%), as does mechanical ventilation, particularly when combined with occupancy sensors. Dynamic building envelopes and Electrical Vehicle charging infrastructure are underdeveloped. As expected, more recent buildings (constructed after 2010) yield higher scores, likely due to the influence of the 2015 "Minimum Requirements" Decree, which introduced the mandatory implementation of at least Class B Building Automation & Control Systems (BACS) for non-residential buildings. It has been noted that "standard" buildings in the original states reports SRI scores in the range 5-15%, indicating minimal smart functionalities and limited adoption of advanced energy management.

Conclusions

The Italian SRI test phase provides an initial but meaningful assessment of smart readiness in non-residential buildings equipped with medium- to high-level Building Management Systems (BMS). Results indicate that, even in technically advanced buildings, average SRI values remain moderate (~40%), with maximum values around 45%. The main limitation is the "Grid" key functionality, which remains low (~15%) due to the absence of active grid-related services, despite the technical readiness of BMSs. High scores in lighting and mechanical ventilation, particularly when integrated with occupancy-based controls, highlight the effectiveness of automation strategies already implemented. In contrast, dynamic building envelopes and electric vehicle charging infrastructure remain underdeveloped, representing potential areas for improvement. More recent buildings show higher SRI scores, reflecting the positive impact of regulatory measures such as

the 2015 “Minimum Requirements” Decree, which mandated at least Class B BACS for non-residential buildings. Overall, these findings suggest that future improvements in SRI performance will rely less on technological limitations and more on regulatory and market frameworks enabling building-grid interaction and wider deployment of smart services. The outcomes of this pilot phase provide a valuable reference for guiding the implementation of SRI regulations across Europe.