SRI-ENACT

Co-creating Tools and Services
for Smart Readiness Indicator Uptake

Module 1: SRI Fundamentals

The LIFE21-CET-SMARTREADY-SRI-ENACT project has received funding from the European Union's LIFE Programme under grant agreement N°101077201

In a nutshell

What?	**Assessment of a building's capacity to accommodate smart ready services**
Why?	Raise awareness about the **added value of building smartness**, stimulate investment, support technology uptake
Who?	EU Member States (currently **optional, mandatory from 2026** for some building types)
How?	Structured methodology from the EC, **customisable** to the local context
So far?	The SRI is currently being officially tested in 13 EU countries: Austria, Belgium (Flanders), Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Poland, Slovenia and Spain.

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SRI in the EU policy landscape

- The EU introduced the SRI as part of its efforts to promote energy efficiency and sustainability in buildings, key principles of the European Green Deal and the Renovation Wave;
- A first technical study issued by the EC in 2017, where a definition of the SRI was attempted and a draft methodology for its calculation was developed, introduced the concept of SRI;
- The 2018 revision of the EPBD Directive formally introduced the concept of a "**Smart Readiness Indicator" (SRI): a common EU framework for rating the smart readiness of buildings**;
- September 2020: the EC officially released the results of the second technical study on SRI accompanied by two Excel sheet-format annexes, namely Annex C (a simplified service catalogue) and Annex D (a detailed service catalogue);
- December 2020 – the SRI legal acts are published:
  - ✓ The SRI delegated act establishes an optional common Union scheme for assessing the smart readiness of buildings.
  - ✓ The SRI implementing act provides detailed technical guidelines for the effective implementation of this scheme.

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SRI definition

- Commission Delegated Regulation 2020/2155:
  - "an indicator that informs on the rating of smart readiness of a building or building unit in line with Article 8(10) of Directive 2010/31/EU" (article that refers to technical building systems).

- In other words:
  - the SRI is a metric designed to gauge the level of digitalization and technological integration within a building, indicating its preparedness to harness and optimize smart technologies for adapting the operation of buildings to the needs of the occupants and the grid and for improving the energy efficiency of the building and the energy chain (supply and demand optimisation) (Zirngibl et all, 2020).

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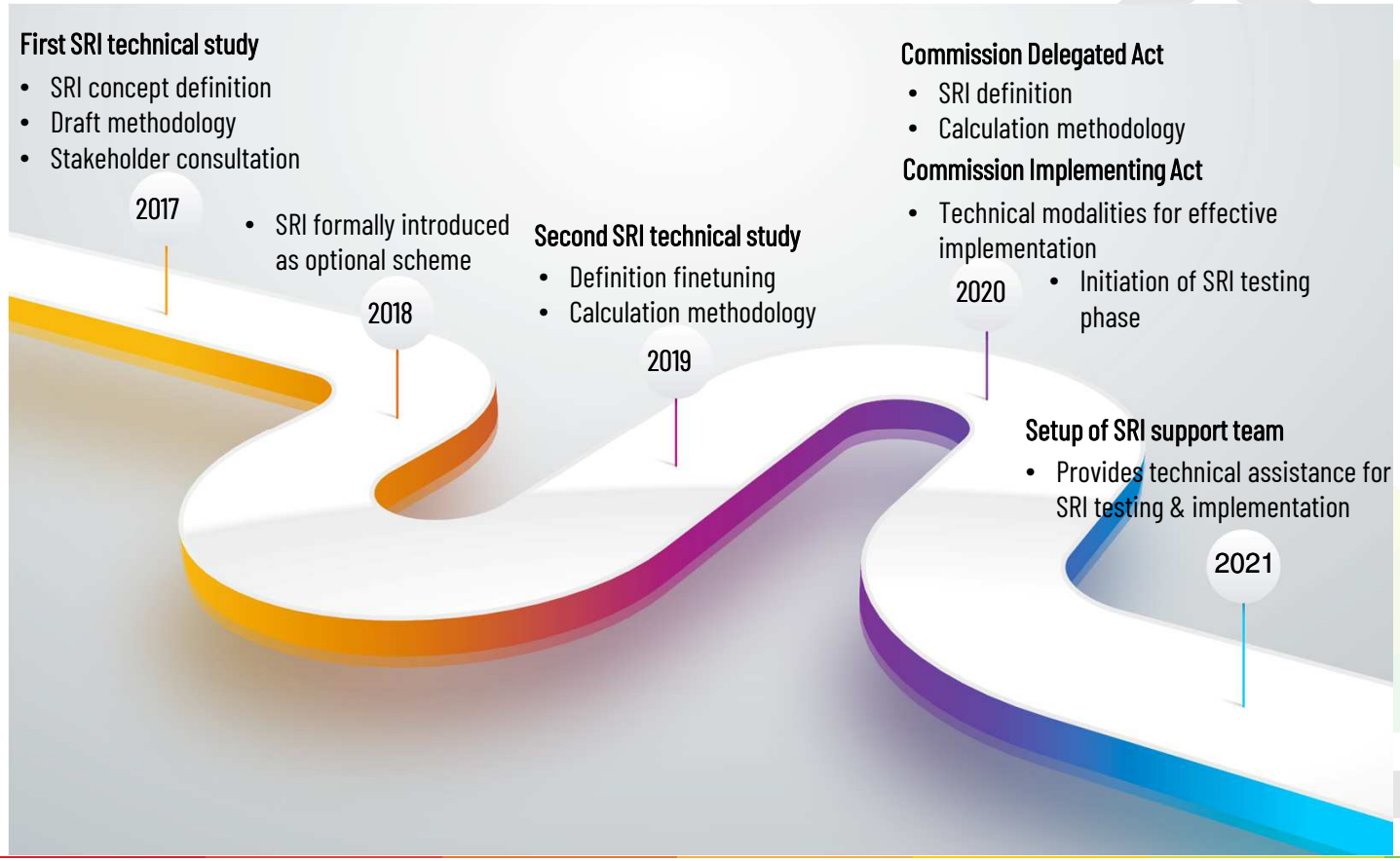
History of the SRI



- Member States are now officially invited to voluntarily implement the SRI (with optionally, a preliminary test phase)

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SRI test phase

The decision to lauch an SRI assessment test phase (and implementation thereafter) lies within the EU Member States

No formal SRI certifications issued **WITHOUT** Member State agreement

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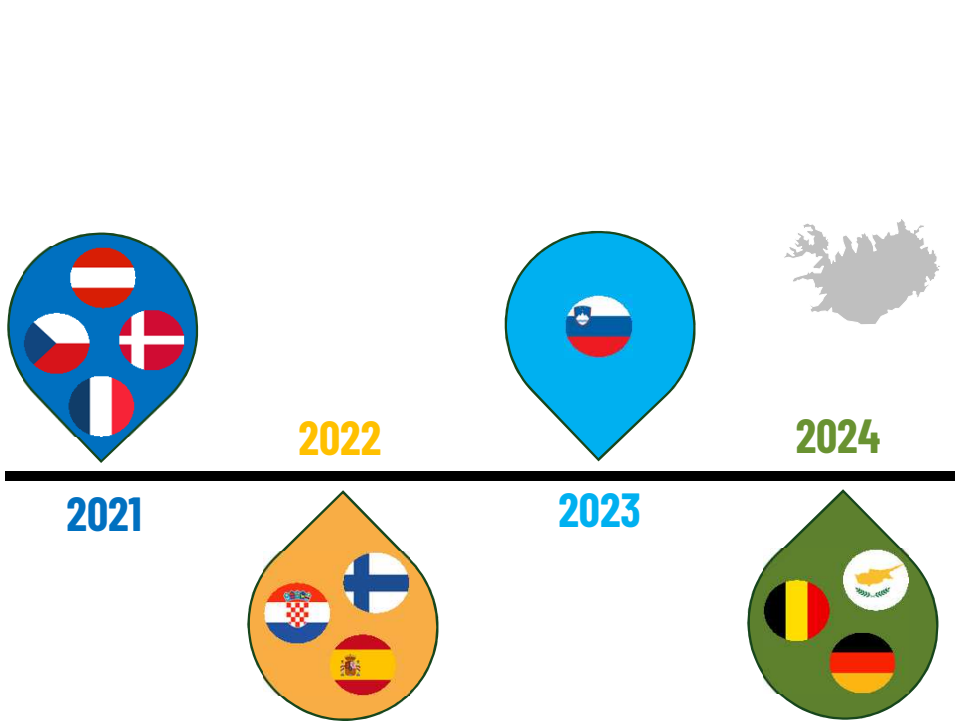

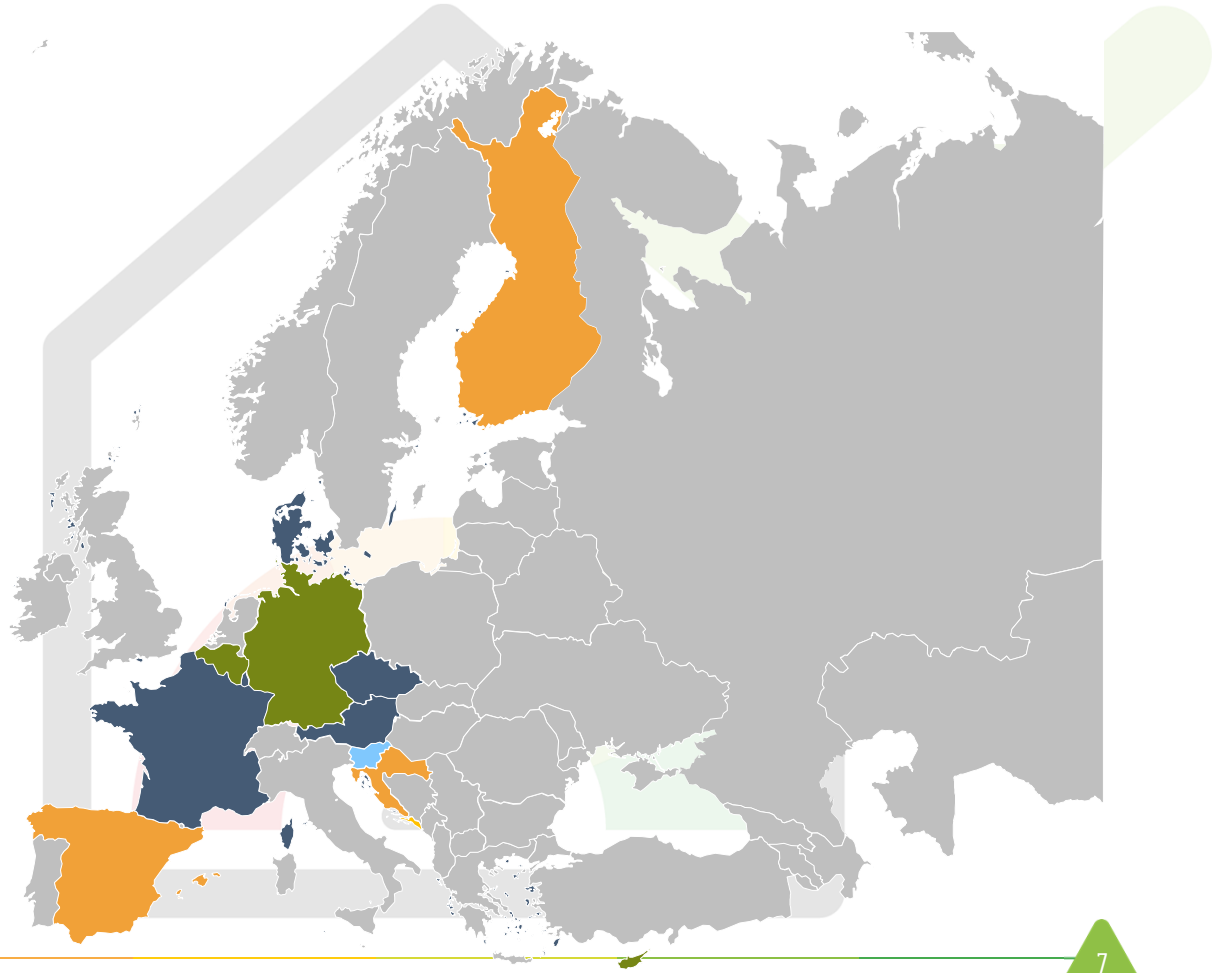

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Implementation pathways

- Linkage of the SRI to the EPC so that an SRI assessment is triggered each time an EPC is about to be issued
- Linkage of the SRI to the construction of new buildings and major renovations
- Market-based voluntary scheme based on self-assessment and supported by on-line tools and 3rd party certified bodies for those willing to pay
- Market-based voluntary scheme based on self-assessment and supported by on-line tools and 3rd party certified bodies subsidised by the state/utilities in the context of promoting flexibility, energy efficiency, self-generation, etc.
- Linkage to the Building Automation and Control Systems (BACS) and Technical Building Systems (TBS) deployment, drawing from Articles 8, 14 and 15 of the EPBD
  - Article 8 provisions the installation, upgrade, and replacement of TBS and measures to encourage the deployment of automatic temperature regulation and zoning
  - Articles 14 (heating inspections) and 15 (cooling inspections) require all **non-residential buildings** with equivalent rated capacity for heating/cooling > 290 kW to have BACS by 2025
- Linkage to the roll-out of smart meters
- Mix of the above based on subsidies, financial instruments, etc.

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Main challenges

- Limited availability of open data (e.g., EPC inspections, etc.)
- Potential low credibility of the results, as inspectors may falsely fill the inspection sheet in order to improve the EPC class of a building (for instance, by indicating that there is a BACS in a building when it is actually absent or not working)
- Inadequate training of the inspectors
- Lack of financial motives and programmes to support a wide uptake of smart technologies
- Personal data to be handled - GDPR and cybersecurity issues raised

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SWOT Analysis

Options	Strengths	Weaknesses	Opportunities	Threats
Linkage to EPC	Rapid deployment, use existing EPC framework	Increased EPC assessment time, cost, and complexity	Rapid SRI-related regulatory adjustments, funding	Backlash among building owners
Linkage to new buildings and major renovations	Motivation for the construction sector	Few new buildings and major renovations	Collaboration between different industries	Higher prices for new buildings
Market-based scheme (self-assessment, 3rd party inspections)	Almost no regulatory costs, promotion to citizens through the tool	Lowest coverage compared to the other options	Market is engaged	Inspectors and building owners may not commit to this plan
Subsidised market-based scheme	Same as Option 4, increased engagement	Higher engagement as Option 4 (but still lower than EPC-linked)	Same as Option 4	Same as Option 4
Linkage to BACS and TBS deployment	Influences design and procurement of BACS	Additional regulatory cost imposed on BACS installation	Additional certification of the HVAC systems through SRI	Lack of adequate certified SRI assessors will slow down the BACS deployment as well
Linkage to smart meter deployment	Widespread deployment	Additional regulatory cost on smart meters' roll-out	Engage utilities in the SRI scheme	Resentment against smart meters will affect SRI as well

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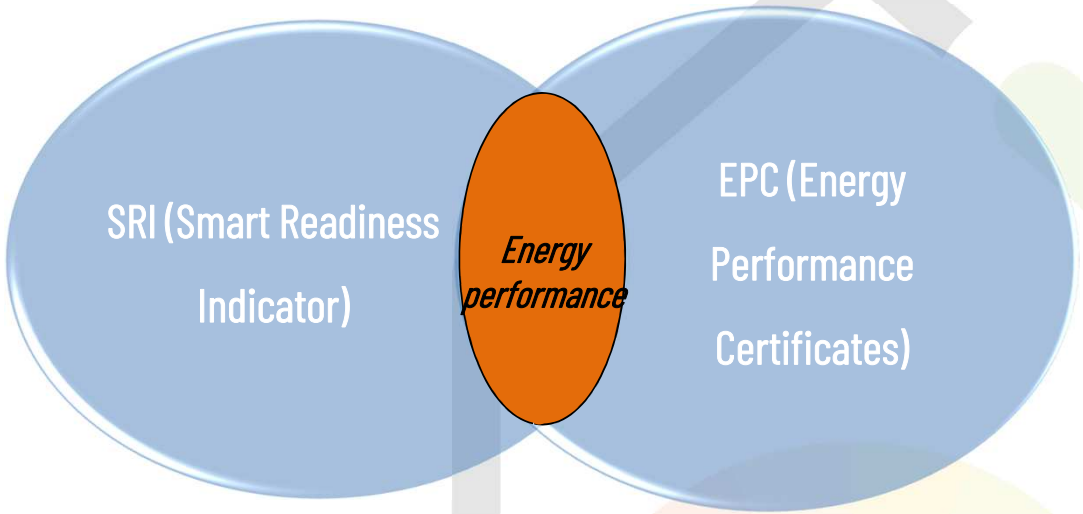
Direction of the EC



! EU suggests that SRI may be coupled with EPCs towards enhancing energy performance !

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SRI benefits

Benefits resulting from the implementation of the SRI methodology:

- implementing the SRI methodology can lead to significant energy savings by identifying opportunities to optimize energy consumption through the integration of smart systems, sensors, and controls;
- the SRI helps identify cost-effective strategies for managing energy use, maintenance schedules, and equipment performance leading to reduced operational and maintenance costs in buildings;
- occupants stand to gain from improved comfort, health, and convenience that smart systems can offer, thereby enhancing their overall living or working experience;

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Benefits resulting from the implementation of the SRI methodology:

- buildings with higher SRI scores are likely to have increased market value due to their improved performance, energy efficiency, and potential for long-term cost savings;
- by improving energy efficiency and reducing resource consumption the SRI contributes to lowering the carbon footprint and environmental impact of buildings, aligning with broader sustainability objectives.
- as buildings are responsible for a significant share of energy consumption and greenhouse gas emissions, evaluating the SRI has great importance in the pursuit of more sustainable and intelligent urban development

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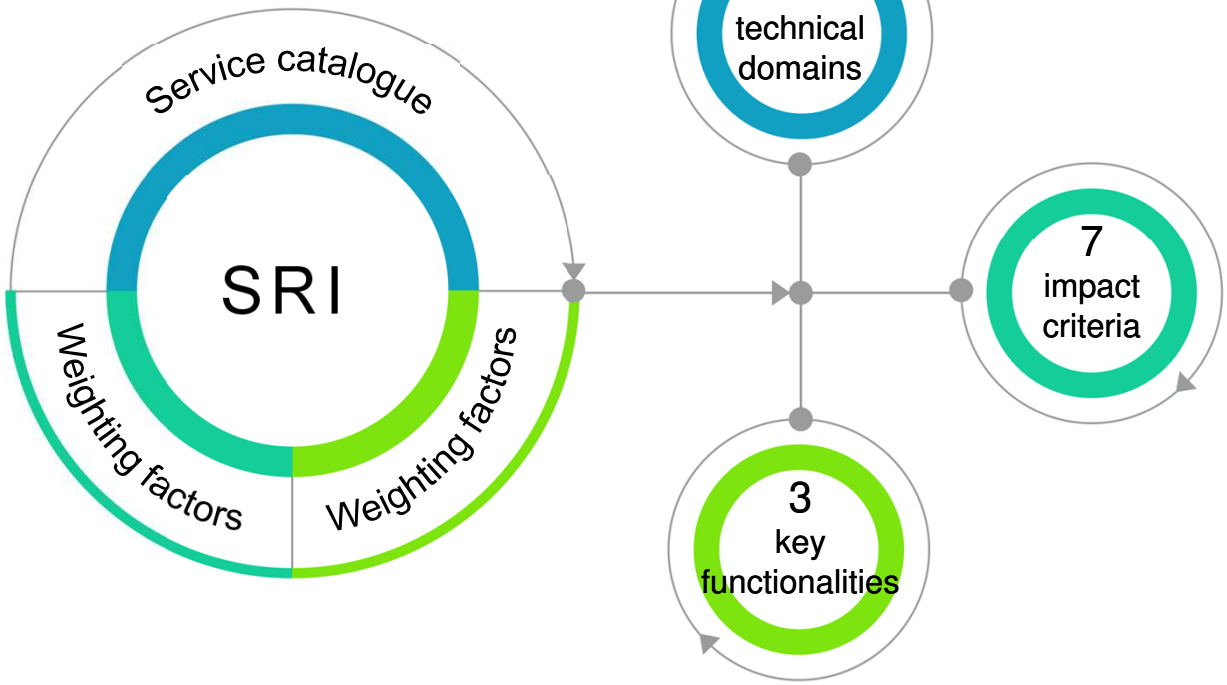
SRI features



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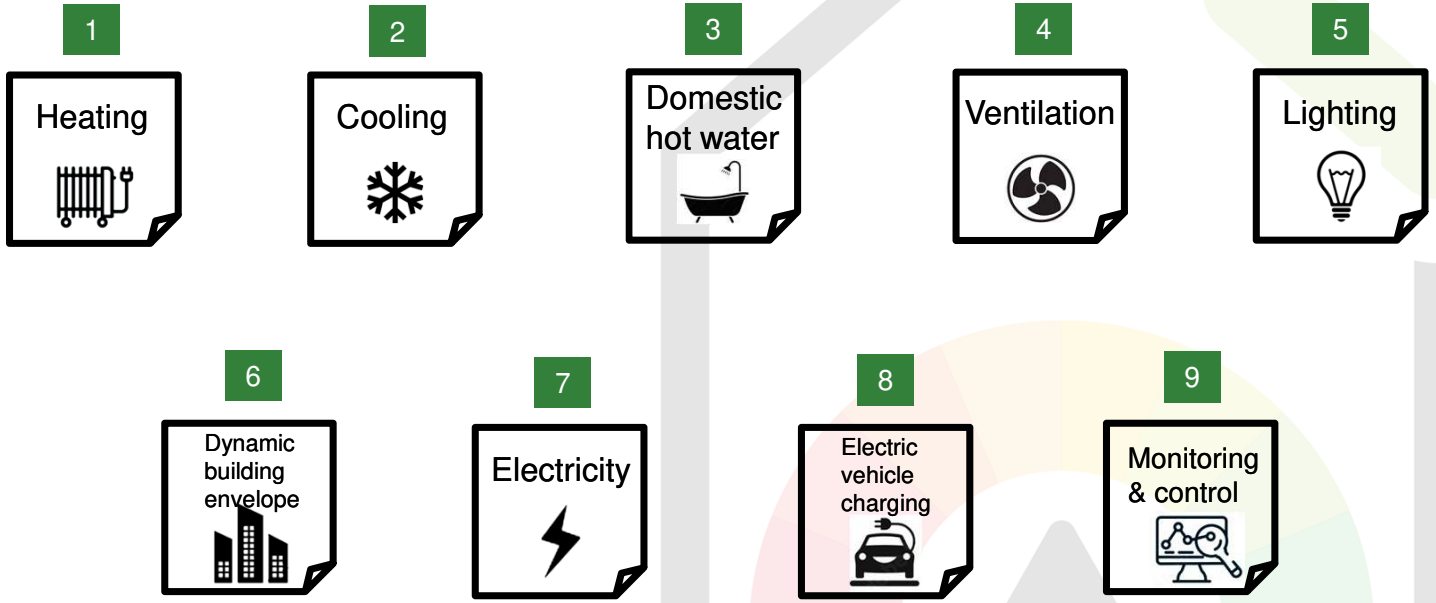
Technical domains



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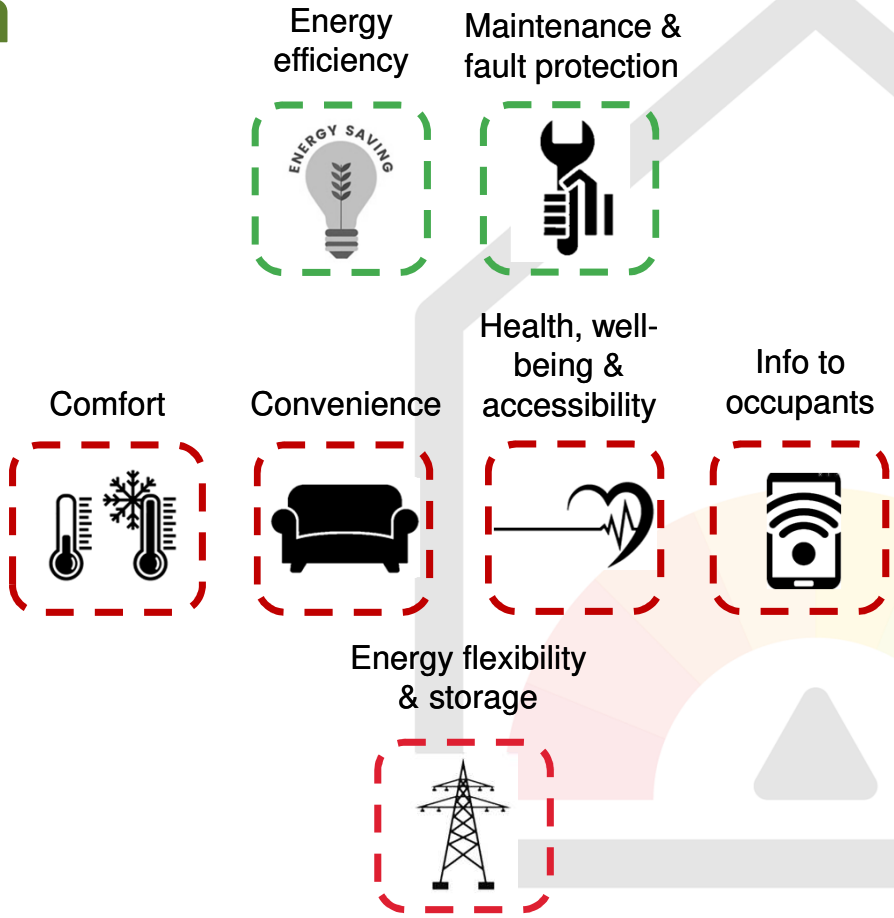
Impact criteria



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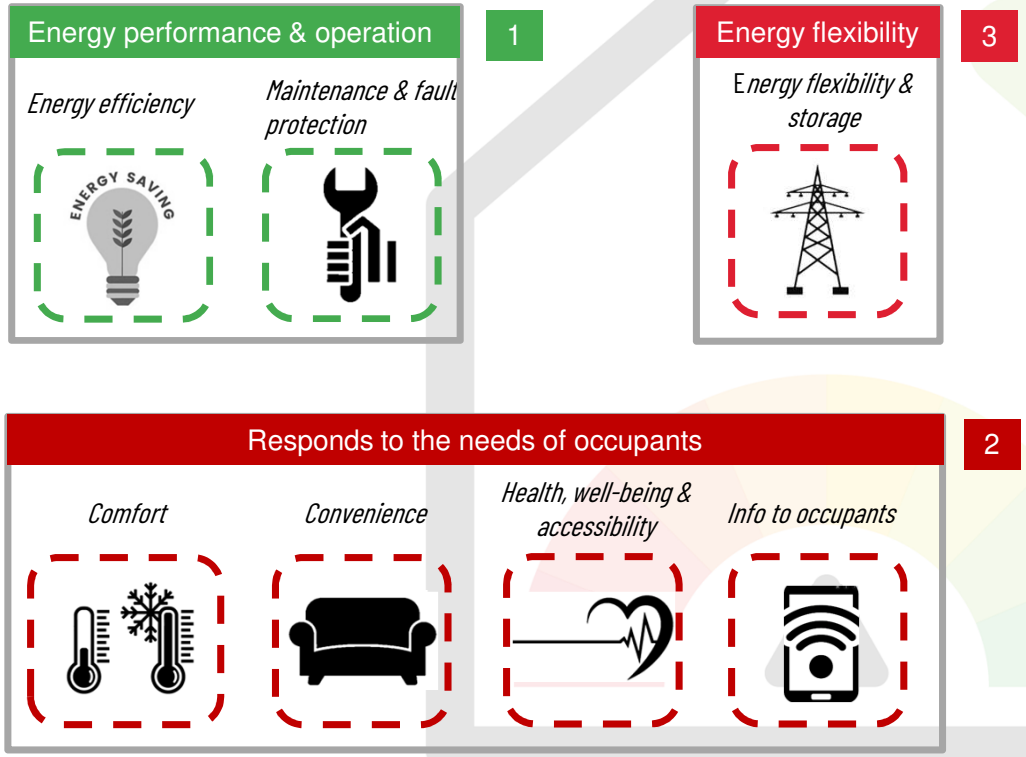
Key functionalities



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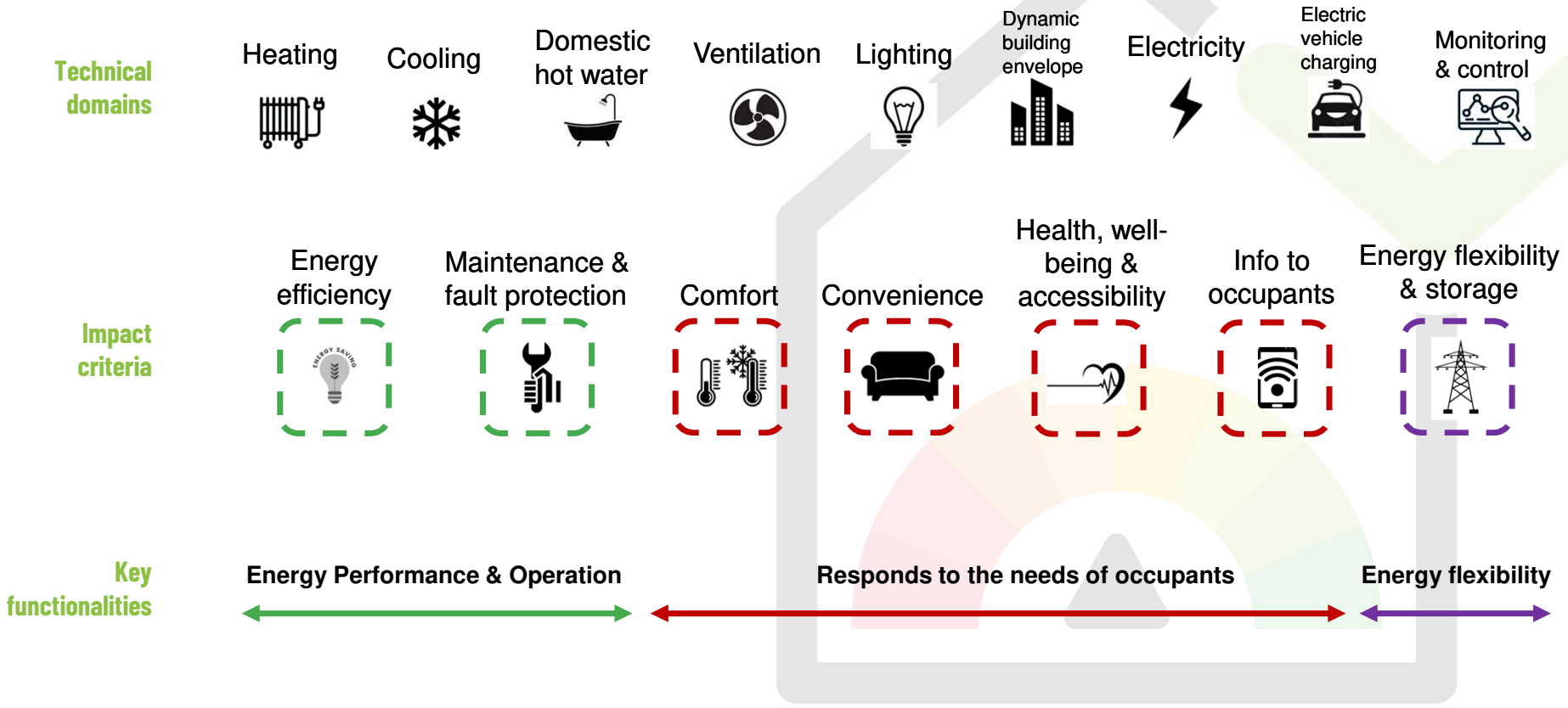
Overall



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SRI methods

Area	Method A	Method B	Method C (customised)
Service catalogue	〉 Simplified list of 27 services	〉 Full list of 54 services	〉 Self-reporting based on Building Automation & Control Systems
Applicability	〉 Existing residential 〉 Small non-residential (< 500 m^2)	〉 New residential 〉 Non-residential	〉 Residential 〉 Non-residential (restricted to occupied buildings)
Other	〉 Checklist approach 〉 Assessment time < 1 hour 〉 Self-assessment possible OR involvement of expert (certification issuing)	〉 Checklist approach 〉 Assessment time < 1 day 〉 Self-assessment possible OR involvement of expert (certification issuing)	〉 Data over a long period required 〉 Detailed specifications not available yet

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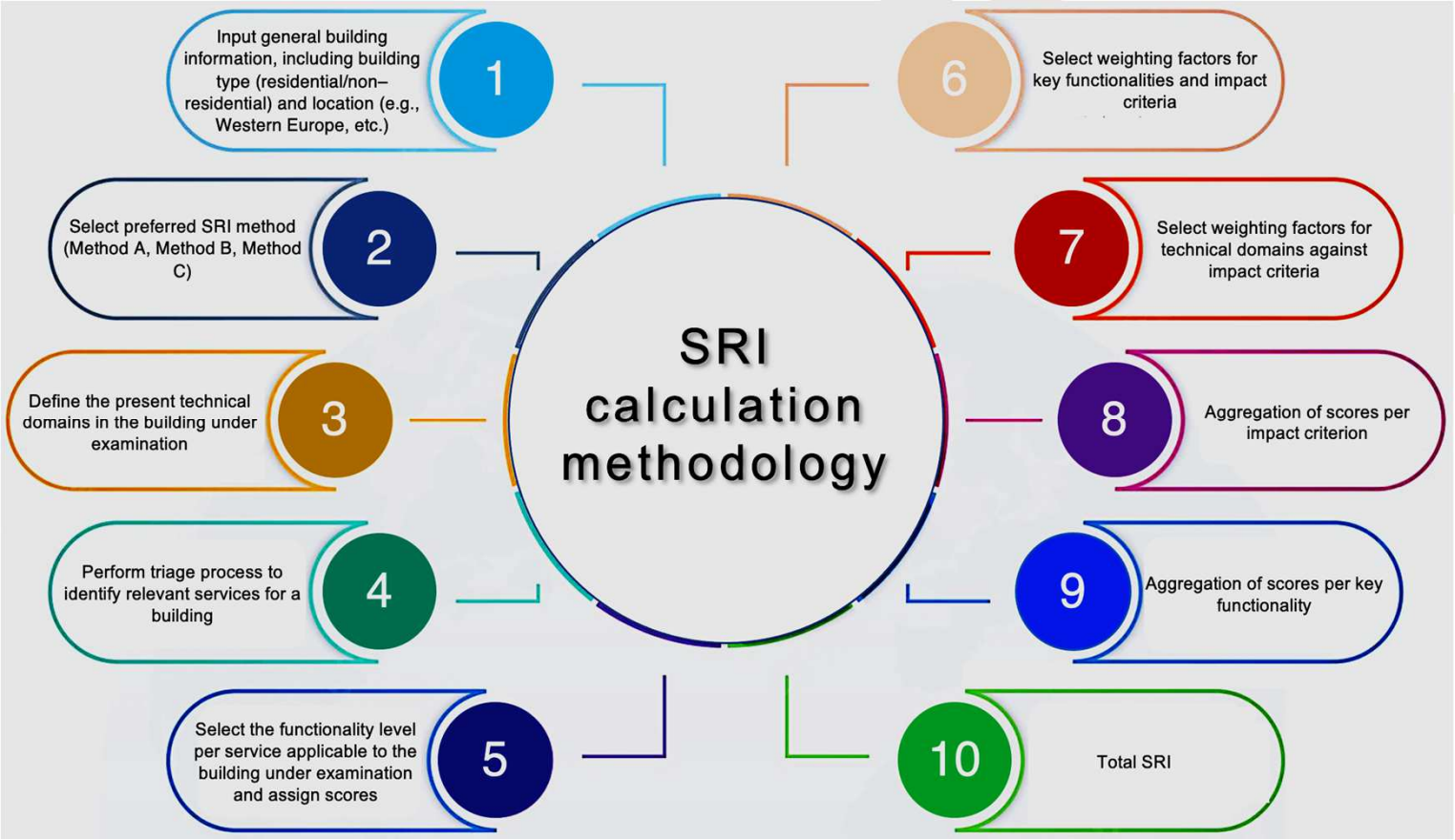
Methodology - Overall



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Smartness levels

Functionality levels of smart ready service A		Pre-defined scores (between 0-3) per smart ready service						
		Energy efficiency	Maintenance and fault protection	Comfort	Convenience	Health, well-being and accessibility	Information to occupants	Energy flexibility and storage
Level 0	Non-smart	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]
Level 1	…	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]
Level 2	…	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]
Level 3	…	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]
Level 4	Maximum smartness	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]	[0-3]

e.g.,

Domain	Smart ready service	Functionality level 0	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4
Heating	Heat emission control	No automatic control	Central automatic control	Individual room control	Individual room control with communication between controllers	Individual room control with communication and presence control

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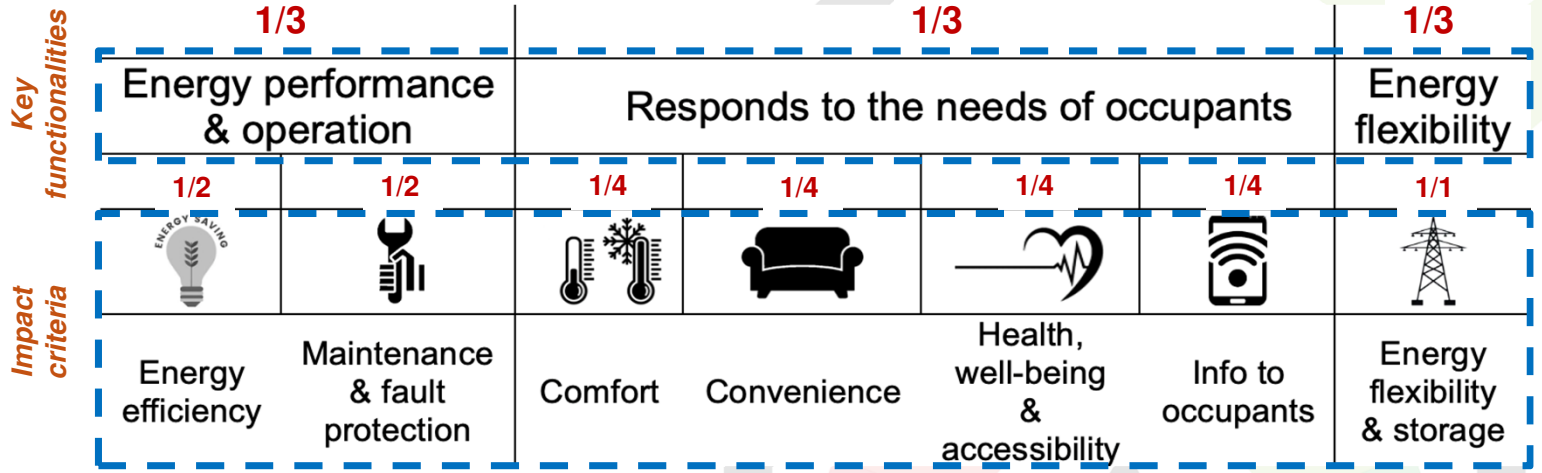
Weighting



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Key functionalities → / Impact criteria → / Technical domains ↓	Energy performance & operation		Responds to the needs of occupants				Energy flexibility
	Energy efficiency	Maintenance & fault protection	Comfort	Convenience	Health, well-being & accessibility	Info to occupants	Energy flexibility & storage
Heating	%	%	16%	10%	20%	11.4%	%
Cooling	%	%	16%	10%	20%	11.4%	%
Domestic Hot Water	%	%		10%		11.4%	%
Ventilation	%	%	16%	10%	20%	11.4%	%
Lighting	%	%	16%	10%	20%		%
Electricity	%	%		10%		11.4%	%
Dynamic Building Envelope	5%	5%	16%	10%	20%	11.4%	
Electric Vehicle Charging				10%		11.4%	5%
Monitoring & Control	20%	20%	20%	20%		20%	20%
Sum of weights	100%	100%	100%	100%	100%	100%	100%

Step 1: Fixed weights

Step 2: Equal weights

Step 3: Energy balance (depending on climate zone & type of building)

Climate zones	Countries
Northern Europe	Finland, **Sweden**, Denmark
Western Europe	UK, Ireland, **Germany**, Austria, France, Belgium, Luxembourg, The Netherlands
Southern Europe	Portugal, Spain, Cyprus, Malta, **Italy**, Greece
North-Eastern Europe	Estonia, Latvia, Lithuania, **Poland**, Slovakia, Czech Republic
South-Eastern Europe	Slovenia, Croatia, Hungary, Bulgaria, **Romania**

5 climate zones

(Northern Europe, Western Europe, Southern Europe, North-Eastern Europe, South-Eastern Europe)

6 building types

(single-family houses, small multi-family houses, large multi-family buildings, offices, wholesale and retail buildings, and educational buildings)

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Calculation

		Energy efficiency	Maintenance & fault protection	Comfort	Convenience	Health, well-being & accessibility	Info to occupants	Energy flexibility & storage		
		Energy performance & operation		Responds to the needs of occupants				Energy flexibility		
		%	%	%	%	%	%	%	%	Aggregation per technical domain
	Heating	%	%	%	%	%	%	%	%	
	Cooling	%	%	%	%	%	%	%	%	
	Domestic hot water	%	%	%	%	%	%	%	%	
	Ventilation	%	%	%	%	%	%	%	%	
	Lighting	%	%	%	%	%	%	%	%	
	Dynamic building envelope	%	%	%	%	%	%	%	%	
	Electricity	%	%	%	%	%	%	%	%	
	Electric vehicle charging	%	%	%	%	%	%	%	%	
	Monitoring and control	%	%	%	%	%	%	%	%	
		%		%		%		%		Aggregation per key functionality
		Total SRI score (%) + SRI class								

3
2
1

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