



Agência para a Energia

SRI – smart readiness indicator

Contexto

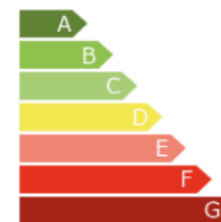
PORQUÊ UM SRI

- ✓ **SENSIBILIZAÇÃO** - sensibilizar para os **benefícios das tecnologias inteligentes** e das TIC nos edifícios;
- ✓ **MOTIVAÇÃO** - motivar os consumidores para **acelerar os investimentos** em tecnologias inteligentes;
- ✓ **ACELERAÇÃO** - apoiar a **aceleração da inovação** tecnológica no edifício setor dos edifícios.

LIGAÇÃO COM A EPBD



SRI como complemento de outros instrumentos no âmbito da EPBD



Maior conforto e saúde dos ocupantes



Gestão da energia mais eficaz



Melhor informação



OBJETIVO → MEDIR A APTIDÃO DO EDIFÍCIO



1



Aptidão para
adaptar em resposta às **necessidades dos ocupantes**

2



Aptidão para
Facilitar **manutenção e operação eficientes**

3



Aptidão para
adaptar em função da **situação da rede de energia**

Fonte: <https://smartreadinessindicator.eu/>

Contexto

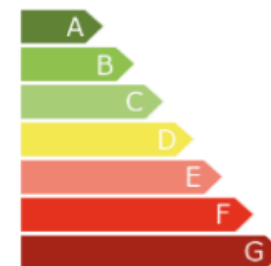
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LIGAÇÃO COM A EPBD



SRI como complemento de outros instrumentos no âmbito da EPBD



OBJETIVO → MEDIR A APTIDÃO DO EDIFÍCIO



1 Aptidão para
adaptar em resposta
às **necessidades**
dos ocupantes



2 Aptidão para
Facilitar
manutenção e
operação eficientes

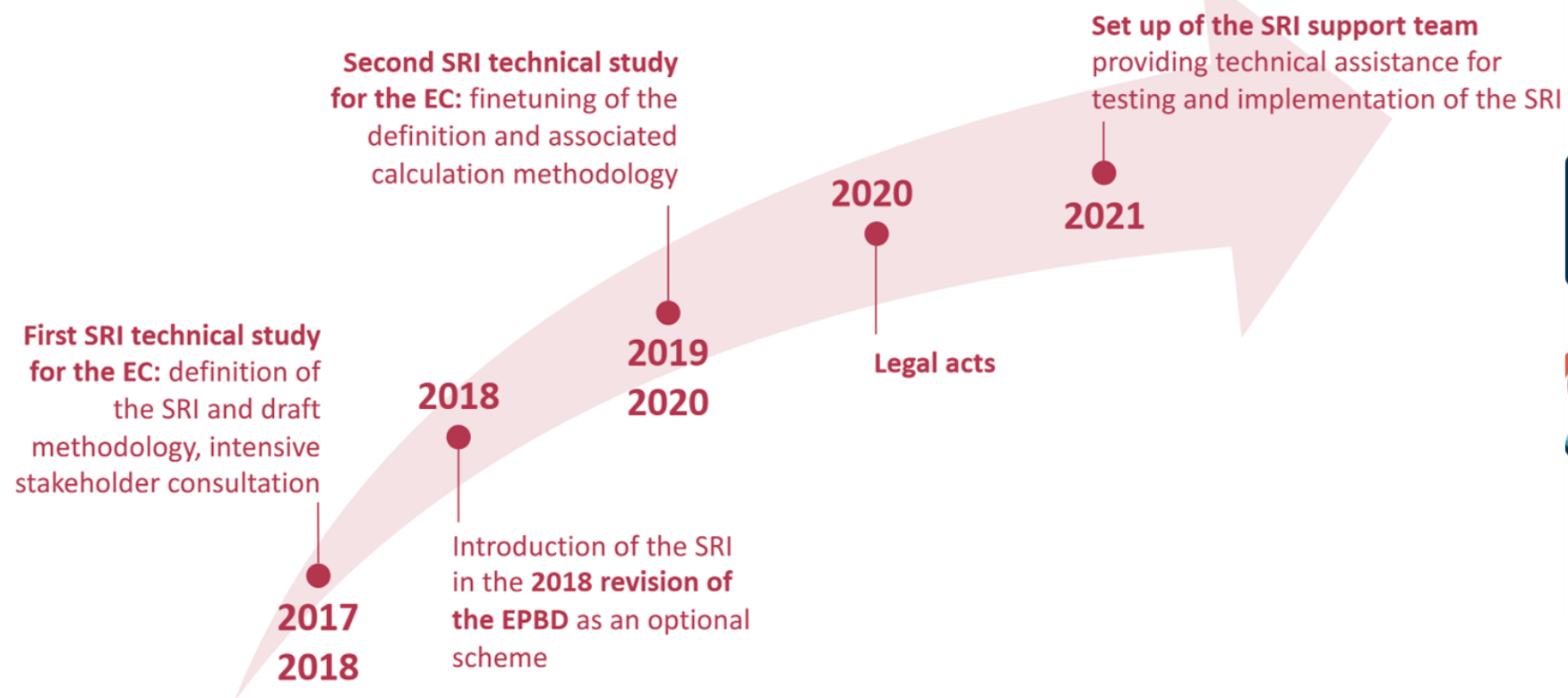


3 Aptidão para
adaptar em função
da **situação da rede**
de energia

Fonte: <https://smartreadinessindicator.eu/>

Contexto

SRI patrocinado pela Comissão Europeia:



Contexto

SRI incluído na legislação

Redes de partilha de conhecimento ativadas

Trabalho técnico de suporte desenvolvido

ELPRE: RCM nº 8-A/2021

EA2 – EDIFÍCIOS INTELIGENTES

Classificação dos edifícios relativamente à sua aptidão para serem inteligentes – através do indicador 'smart readiness indicator'

SCE: Despacho n.º 6476-A/2021

Determina o conteúdo dos certificados energéticos: "pode incluir (...) d) Indicador(es) de aptidão para tecnologias inteligentes."

...+ Suporte aos requisitos SACE



Agência para a Energia

NextGen EPC cluster
Projetos europeus interface EPC ↔ SRI

SRI2MARKET

LIFE-CET PROJECT Nov 2022 – Out 2025

ADENE parceiro

Objetivo 1: Apoiar os Estados-Membros-alvo (Áustria, Croácia, Chipre, França, Portugal, Espanha) na introdução do SRi na regulamentação nacional.

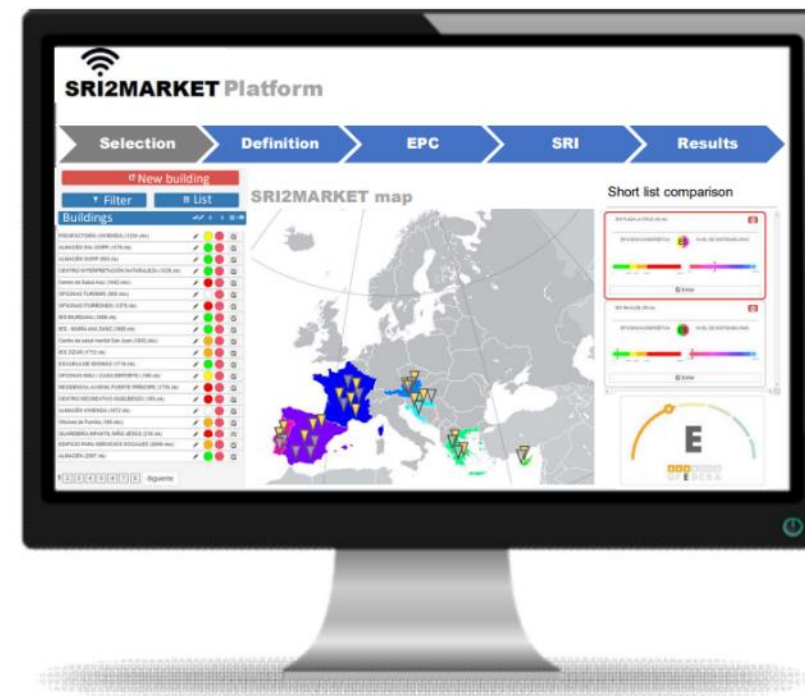
Objetivo 2: Propor esquemas de financiamento para incrementar a aptidão energética dos edifícios

Objetivo 3: Desenvolver uma plataforma web para apoiar peritos e auditores e agilizar as avaliações de edifícios

Objetivo 4: Capacitar os PQ's no SRi e respectiva metodologia de cálculo

Objetivo 5: Estabelecer pilotos SRi a nível nacional para identificar melhores práticas e adaptar o indicador

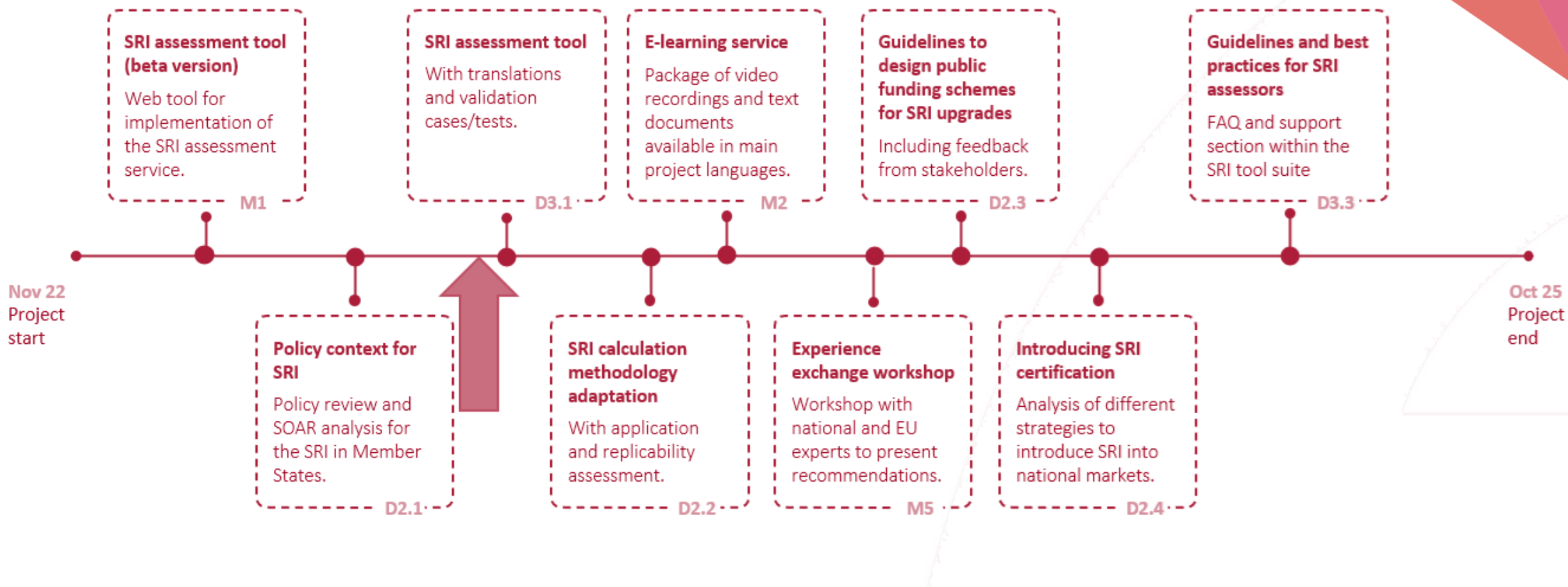
Objetivo 6: Fornecer recomendações aos proprietários e gestores de edifícios de medidas rentáveis de melhoria do SRi



SRI2MARKET

LIFE-CET PROJECT Nov 2022 – Out 2025

ADENE parceiro



LIFE CET – SRI

Bridging projects and policy implementation

4 SRI projects funded under LIFE CET 2021 calls

- 8 M€ funding in total
- 42 partners from 16 member states
- Timeline: Q4 2022 – Q3 2025

SRI2MARKET

Paving the way for the adoption of the SRI into national regulation and market



Co-creating Tools and Services for Smart Readiness Indicator Uptake



Agência para a Energia



easySRI

Improving and demonstrating the potential of SRI



Co-funded by
the European Union

Com toda a energia.

Smart Readiness Indicator (SRI)

Training slide deck

Adapted and shortened

Full version available at: <https://energy.ec.europa.eu/...>



Overview of the scoring methodology



3 key functionalities

- The SRI assesses buildings (or building units), based on their capacity to satisfy three key functionalities:



Optimise energy
efficiency and overall
in-use performance



Adapt their operation
to the needs of the
occupant



Adapt to signals
from the grid
(energy flexibility)

7 impact criteria

- The three key smart-readiness functionalities can be further detailed into seven impact criteria:



1

Optimise energy efficiency and overall in-use performance



2

Adapt their operation to the needs of the occupant



3

Adapt to signals from the grid (energy flexibility)



Energy efficiency



Maintenance and fault prediction



Comfort



Convenience



Health, well-being and accessibility



Information to occupants



Energy flexibility and storage

9 technical domains

- The methodology for calculating the SRI is based on the **assessment of smart-ready services** that the building has or could use ("service catalogue"). These services are grouped into **nine technical domains**:



Heating



Cooling



Domestic hot
water



Ventilation



Lighting



Dynamic building
enveloppe



Electricity



Electric vehicle
charging



Monitoring and
control

Scores calculated at different levels

The assessment provides detailed scores by domain and impact criterion (up to 57 scores)...

	 Energy efficiency	 Maintenance and fault prediction	 Comfort	 Convenience	 Health, well-being and accessibility	 Information to occupants	 Energy flexibility and storage
 Heating	%	%	%	%	%	%	%
 Cooling	%	%	%	%	%	%	%
 Domestic hot water	%	%	%	%	%	%	%
 Ventilation	%	%	%	%	%	%	%
 Lighting	%	%	%	%	%	%	%
 Dynamic building envelope	%	%	%	%	%	%	%
 Electricity	%	%				%	%
 Electric vehicle charging		%		%		%	%
 Monitoring and control	%	%	%	%	%	%	%

Scores calculated at different levels

... but
also aggregate
scores for
each of the
nine technical
domains...

	 Energy efficiency	 Maintenance and fault prediction	 Comfort	 Convenience	 Health, well-being and accessibility	 Information to occupants	 Energy flexibility and storage	
 Heating	%	%	%	%	%	%	%	%
 Cooling	%	%	%	%	%	%	%	%
 Domestic hot water	%	%	%	%	%	%	%	%
 Ventilation	%	%	%	%	%	%	%	%
 Lighting	%	%	%	%	%	%	%	%
 Dynamic building envelope	%	%	%	%	%	%	%	%
 Electricity	%	%				%	%	%
 Electric vehicle charging		%		%		%	%	%
 Monitoring and control	%	%	%	%	%	%	%	%

Scores calculated at different levels

.. aggregate scores
for each of
the seven impact
criteria...

		%	%	%	%	%	%	%
		 Energy efficiency	 Maintenance and fault prediction	 Comfort	 Convenience	 Health, well-being and accessibility	 Information to occupants	 Energy flexibility and storage
	Heating	%	%	%	%	%	%	%
	Cooling	%	%	%	%	%	%	%
	Domestic hot water	%	%	%	%	%	%	%
	Ventilation	%	%	%	%	%	%	%
	Lighting	%	%	%	%	%	%	%
	Dynamic building envelope	%	%	%	%	%	%	%
	Electricity	%	%				%	%
	Electric vehicle charging		%		%		%	%
	Monitoring and control	%	%	%	%	%	%	%

Scores calculated at different levels

%		%				%	
 Optimise energy efficiency and overall in-use performance		 Adapt its operation to the needs of the occupant				 Adapt to signals from the grid (energy flexibility)	
%	%	%	%	%	%	%	
 Energy efficiency	 Maintenance and fault prediction	 Comfort	 Convenience	 Health, well-being and accessibility	 Information to occupants	 Energy flexibility and storage	
 Heating	%	%	%	%	%	%	%
 Cooling	%	%	%	%	%	%	%
 Domestic hot water	%	%	%	%	%	%	%
 Ventilation	%	%	%	%	%	%	%
 Lighting	%	%	%	%	%	%	%
 Dynamic building envelope	%	%	%	%	%	%	%
 Electricity	%	%				%	%
 Electric vehicle charging		%		%		%	%
 Monitoring and control	%	%	%	%	%	%	%

... aggregate scores for each of the seven impact criteria...

Scores calculated at different levels

Overall SRI score (%) + SRI class								
%		%				%		
 1 Optimise energy efficiency and overall in-use performance		 2 Adapt its operation to the needs of the occupant				 3 Adapt to signals from the grid (energy flexibility)		
%		%	%	%	%	%		
 Energy efficiency	 Maintenance and fault prediction	 Comfort	 Convenience	 Health, well-being and accessibility	 Information to occupants	 Energy flexibility and storage		
 Heating	%	%	%	%	%	%	%	%
 Cooling	%	%	%	%	%	%	%	%
 Domestic hot water	%	%	%	%	%	%	%	%
 Ventilation	%	%	%	%	%	%	%	%
 Lighting	%	%	%	%	%	%	%	%
 Dynamic building envelope	%	%	%	%	%	%	%	%
 Electricity	%	%				%	%	%
 Electric vehicle charging		%		%		%	%	%
 Monitoring and control	%	%	%	%	%	%	%	%

... and the overall SRI score together with the corresponding SRI class (seven classes, from SRI < 20% to SRI > 90%)



Two methods: A (simplified) and B (detailed)

Method A (simplified)

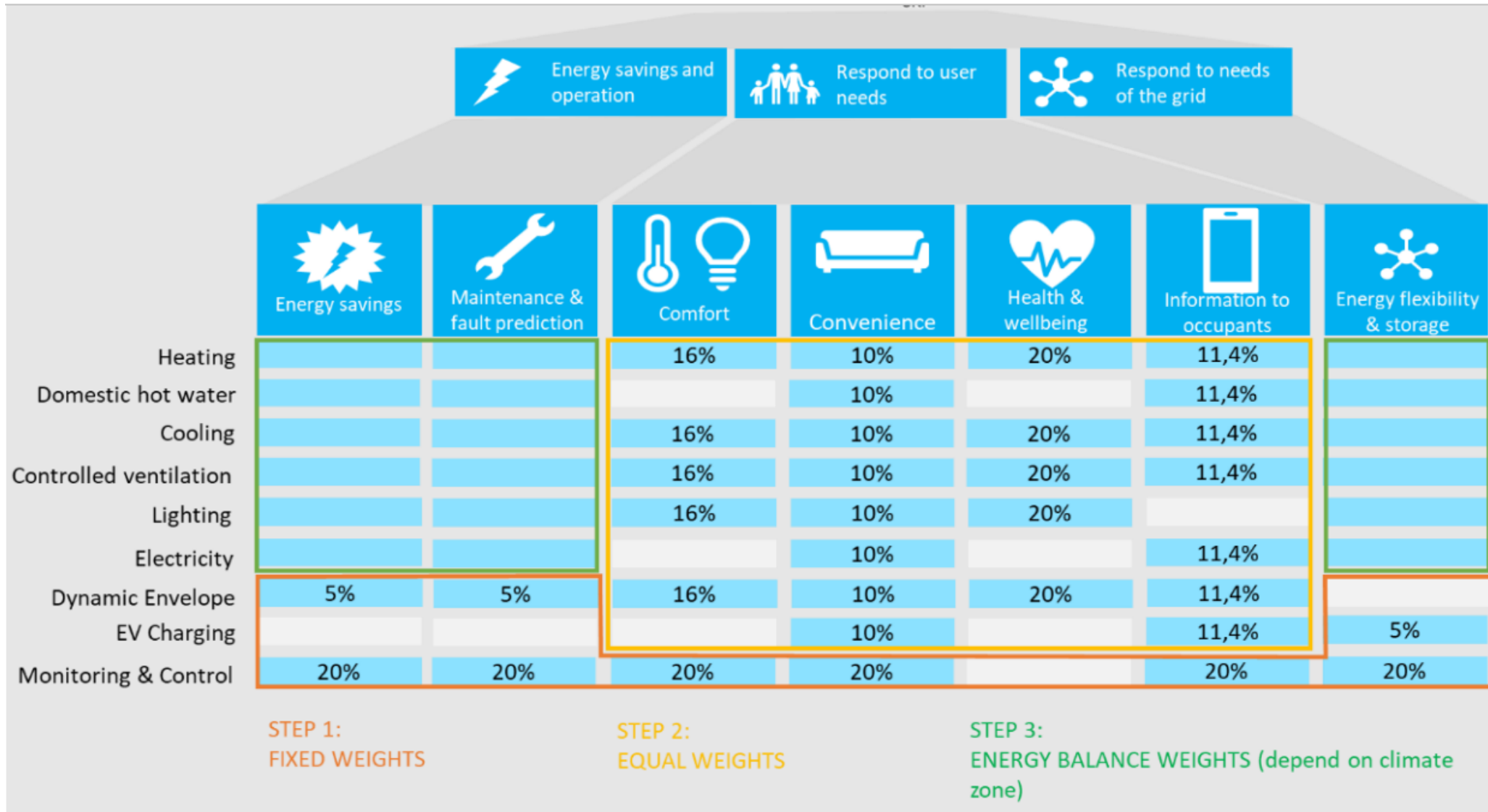
- Simplified service catalogue
- Typically for **existing residential buildings** or **small non-residential buildings** (low complexity)
- Check-list approach
- Assessment time < 1 hour
- Self-assessment possible

Method B (detailed)

- Full, detailed service catalogue
- Typically for **new buildings** and **non-residential buildings** (higher complexity)
- On-site inspection / walk-through needed
- Assessment time < 1 day
- Necessary involvement of an expert, with support from a facility manager

- The assessment process is the same for both methods
- The service catalogue is different, which means the level of expertise required to conduct the assessment is different

Two methods: A (simplified) and B (detailed)



How to assess the smart readiness of a building



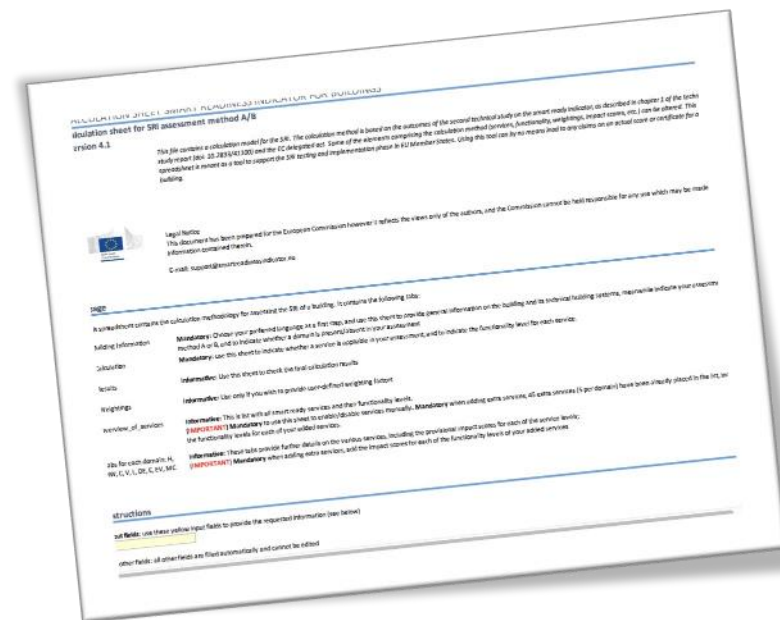
The SRI assessment package

- The SRI assessment package is available upon request by filling [this form](#).
- It is based on the generic SRI methodology developed at the EU level, and it can be adapted to specific contexts
- It includes:

**A practical guide
(PDF)**



**A calculation sheet
(Excel)**



The SRI calculation sheet

Multiple tabs:



- General information & glossary
- Important instruction:

Input fields: use these yellow input fields to provide the requested information (see below)

All other fields: all other fields are filled automatically and cannot be edited

The SRI calculation sheet

Multiple tabs:

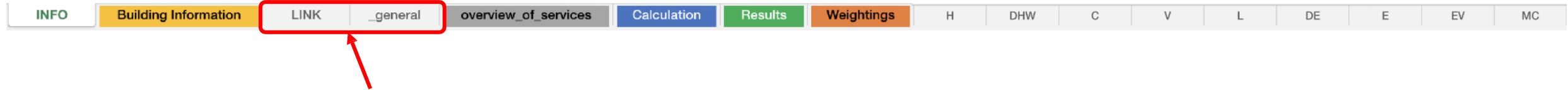


- Language choice
- Assessor information
- Building information
 - Includes the location (country) to which a predefined climate zone is automatically assigned.

- Important choices to be made for the assessment
 - Choice between method A and B
 - Choice between default or user-defined weighting factors.
 - Triage process depending on the presence of each of the nine technical domains in the building.

The SRI calculation sheet

Multiple tabs:



- Pages with technical information for the calculations. No user input needed.

The SRI calculation sheet

Multiple tabs:



- Catalogue of smart-ready services and corresponding functionality levels.

- The catalogue is either
 - Full if method B has been chosen: 54 pre-defined services
 - Simplified if method A has been chosen: 27 pre-defined services
- The services can also be user-defined:
 - Each pre-defined service can be enabled or disabled manually
 - Additional services can be defined by the user for each technical domain

The SRI calculation sheet

Multiple tabs:



- This tab is where the assessment is performed by the assessor. For each service available, the assessor evaluates the functionality level enabled by the building.
- This is the main page to be used by the assessor, who is also invited to provide the estimated assessment time (minutes) and optional comments.

Some examples of functionality levels

From non-smart...

... to maximum smartness

Code	Smart ready service	Functionality level 0 (default)	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4
H-1a	Heat emission control	No automatic control	Central automatic control (e.g. Central thermostat)	Individual room control (e.g. thermostatic valves, or electronic controller)	Individual room control with communication between controllers and to BACS	Individual room control with communication and occupancy detection
DHW -3	Report information regarding domestic hot water performance	None	Indication of actual values (e.g. temperatures, submetering energy usage)	Actual values and historical data	Performance evaluation including forecasting and/or benchmarking	Performance evaluation including forecasting and/or benchmarking; also including predictive management and fault detection
C-2a	Generator control for cooling	On/Off-control of cooling production	Multi-stage control of cooling production capacity depending on the load or demand (e.g. on/off of several compressors)	Variable control of cooling production capacity depending on the load or demand (e.g. hot gas bypass, inverter frequency control)	Variable control of cooling production capacity depending on the load AND external signals from grid	



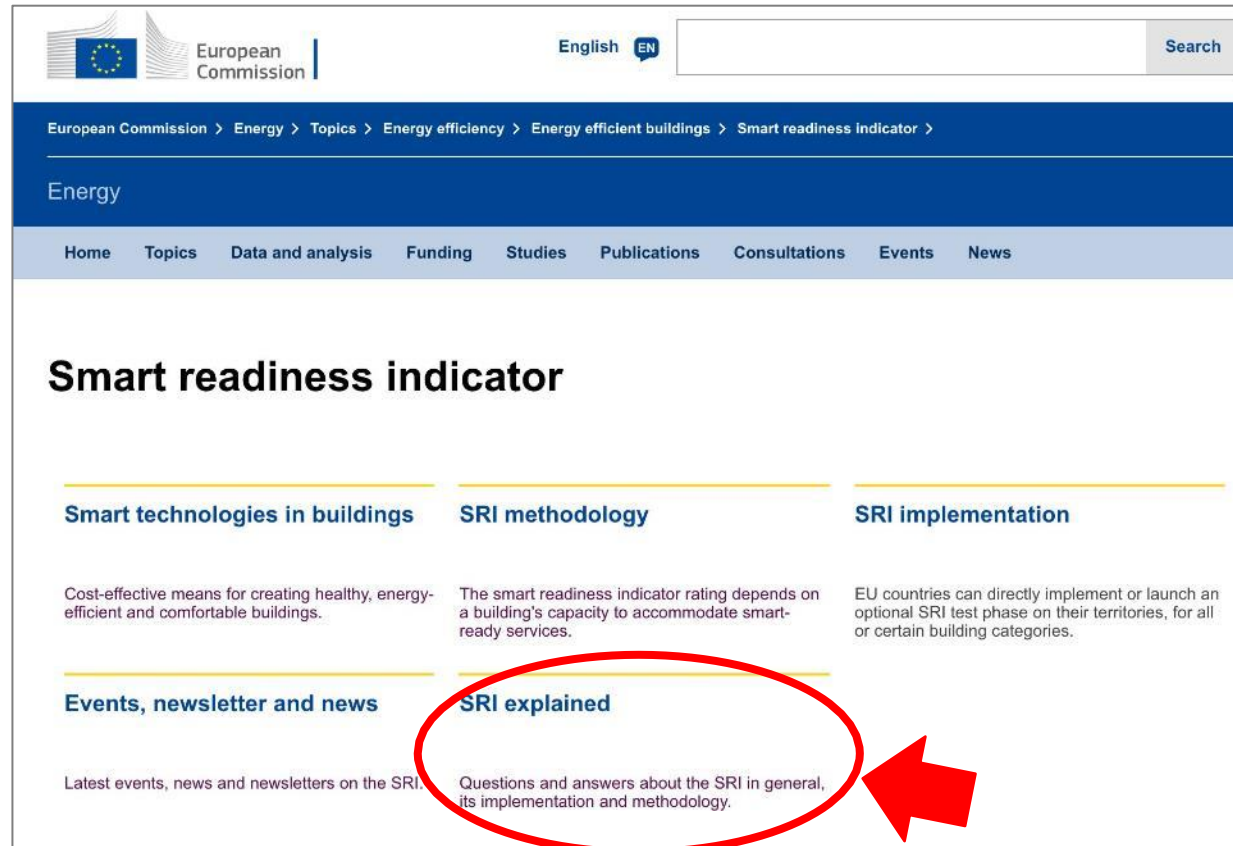
Tips and tricks

Frequently asked questions



Frequently asked questions (F.A.Q.)

- An F.A.Q. section is available on the SRI webpage:
<https://ec.europa.eu/smart-readiness-indicator>



- It is regularly updated, always check it first
- New questions can be sent to the SRI support team at support@smartreadinessindicator.eu

What if some services are not uniformly present in the building?

Example: Control of artificial lighting power based on daylight levels may be installed in the open office space, but not in corridors

Columns K and L in the Calculation tab enable testing partial compliance of a building to the main functionality level:

Code	Service group	Smart ready service	Service applicable in your building? - to be assessed by the assessor: 1 - applicable; 0 - not applicable	Main functionality level as inspected by SRI assessor	K	L
					share (default = 100% means applicable throughout the building)	Optional: additional functionality level in part of the building
L-2	Control artificial lighting power based on daylight levels	Control artificial lighting power based on daylight levels	 1	3	60%	0

In this case, the functionality level is 3 for 60% of the net surface floor area, and is 0 for the remaining 40%

- For each service, no more than two functionality levels are accommodated by the calculation sheet

What is the normalisation of the SRI score?

CALCULATION OF SRI SCORE

energy



$$x\% = a/b$$

theoretical maximum

a =
score

b =
max. building





What is the triage process?

- The triage process identifies the relevant services for a specific building
- Smart services can be:
 - **Not relevant for this particular building**
 - ***Examples:** services on controlling a heat pump, when no heat pump is present; or services on electrical vehicle chargers when there are no parking spots available*
 - Such services are not taken into account in the calculation (this can be indicated in the calculation sheet, tab 'overview of services')
 - **Relevant because they are present**
 - In the SRI score ratio, the actual impacts are assessed (numerator of the ratio) and compared to the maximum impacts of those services (denominator of the ratio)
 - **Relevant because they should be present (from a policy perspective)**
 - ***Example:** even though there is not battery storage available, the potential impacts can be taken into account for defining the maximum obtainable score (denominator of the SRI score ratio)*



Can the SRI methodology be applied to a single flat (part of a bigger building)?

- The SRI methodology can be applied both to:
 - parts of a building (**examples**: a flat; a restaurant)
 - the building as a whole

Examples:

- In a multi-family building, the SRI score can be the surface-weighted average of the scores of the individual flats
- In a multi-purpose non-residential building, different SRI scores can be calculated for each part of the building (for instance: restaurant, hotel rooms, sport facilities,...) and then aggregated into a single score at building level by weighting the different scores by the corresponding surface areas.

- The legal acts at EU level do not address this topic
- Experience feedback from the field is welcome

How are the different climate zones in the EU taken into account?

- 5 climate zones have been defined
- In the SRI calculation, weighting factors depend on the climate zone:
 - Typically, the heating domain has more importance in Northern areas of Europe
 - And the relative importance of the cooling domain increases in Southern areas of Europe

