Smart Readiness Indicator (SRI)

Provisional guidance on the implementation of the SRI

Authors: Paul Waide (WSEE), Stijn Verbeke (VITO), Sophie Dourlens & Regis Decorme (R2M), Sylvain Kubicki (LIST)

Date: 2 February 2023

DISCLAIMER

This document is provided by the SRI support team, comprised of VITO (Belgium), Waide Strategic Efficiency Europe (Ireland), Research to Market (R2M) Solution (France) and LIST, the Luxembourg Institute of Science and Technology. The SRI support team has been awarded a two-year service contract by the European Commission in order to provide technical assistance to the European Commission services and to Member States in the first phases of the testing and implementation of the SRI.

This document has been prepared for the European Commission; however, it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

GLOSSARY

AC	Air conditioning
BIM	Building Information Modelling
CA	Concerted Action (of the EPBD)
EC	European Commission
ELR	Energy labelling regulation
ENISA	European Union Agency for Cybersecurity
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
F-gas	Fluorinated gas
H2020	Horizon 2020 EU research programme
HVAC	Heating, ventilation and air conditioning
ICT	Information and communication technology
MFH	Multi-family housing
MS	Member State
QR	Quick Response code
SFH	Single family housing
SRI	Smart Readiness Indicator
SRTs	smart ready technologies
TBS	technical building system

CONTENTS

1 SUMMARY

The European Commission supports a harmonised implementation of the Smart Readiness Indicator (SRI) across the Member States (MS) who voluntarily opt to implement it.

This document, is an output of the activities of the SRI support team, and aims to provide provisional guidance on the implementation of the SRI during the period when Member States may opt to conduct test phases. At a future date the European Commission may prepare formal guidance on the implementation of the SRI informed by the experience accrued during the national test phases. The current version presents guidance that draws upon the knowledge of the SRI technical support team and some experience already relayed through provisional MS testing.

2 METHODOLOGY APPLIED TO DERIVE THE GUIDANCE AND STRUCTURE OF THE GUIDANCE

The work presented in this provisional guidance document is mostly based on desk research and the experience with the SRI and other Energy Performance of Buildings Directive (EPBD) related initiatives to date. It therefore sets out the SRI support team's current thinking with regard to the technical inputs needed to implement the SRI. In particular, it is designed to provide guidance on the following topics[1]:

- Assessment methodology (section 3)
- Format of the SRI certificate (section 4)
- Assessment process and data collection (section 5)
- Assessors (section 6)
- Integration with other assessment schemes (section 7)
- Member State implementation, control and data sharing (section 8).

Figure 1. Areas for EU Guidance

[1] These topics were identified as the priority for guidance in the by the SRI support team

In order to derive this guidance for each of these technical implementation topics the support team has:

- analysed the relevant earlier work from the preceding two SRI technical assistance studies[2] and expanded upon it where relevant to ensure all appropriate inputs to devise the implementation guidance have been compiled and assessed
- identified actions that Member States would need to take and/or issues they would need to understand to be able to effectively implement the SRI in relation to the topic in question
- identified the issues that are likely to be encountered and identified/devised/proposed best/good practice approaches to address these
- identified and proposed any relevant definitions and clarifications of scope
- identified links to relevant complementary actions or initiatives that can inform or support Member State implementation of the SRI in relation to the topic
- considered resource requirements
- considered timing dependencies and any causal relationships with other implementation aspects
- proposed a clear set of logical step-by-step implementation actions (using analogies to similar activities when helpful/relevant) to unambiguously communicate the pathway or pathways that are available to address the topic.

In addition to building on the earlier SRI technical assistance studies the team has made use of relevant experience from the implementation of related aspects of the EPBD such as Energy Performance Certificates (EPCs), technical building system (TBS) inspections, etc. and in particular compiled relevant inputs from the work published by the EPBD Concerted Action (CA) on Certification, Inspections, Training, Effectiveness of support initiatives, Compliance and Control, and Enforcement as well as the implementation experience conveyed in the CA Country Reports. This is complemented by processing inputs from relevant H2020 projects (some of which study team members are directly involved in) such as the EPC RECAST project[3] (H2020 grant agreement n°893118), XTendo[4] project (H2020 grant agreement n°845958) and the ePANACEA[5] project (H2020 grant agreement 892421).

The structure of the provisional guidance presented in the subsequent sections of this report follows the order of the topics identified above. Each section begins with a recap of the requirements laid down in the SRI delegated and implementing regulations and then sets out the guidance and recommendations on how to address these.

[2] https://op.europa.eu/en/publication-detail/-/publication/f9e6d89d-fbb1-11ea-b44f-01aa75ed71a1

[3] https://epc-recast.eu/

[4] https://x-tendo.eu/

[5] https://epanacea.eu/

3 ASSESSMENT METHODOLOGY

The following items are considered for EU Guidance in relation to the SRI assessment methodology

- **Overview/description** of the SRI assessment methodology
- Detailed **definition of smart-ready catalogues**, with suggestions for parts which are common for all national implementations for the SRI and potential adaptations to be considered at the national level. Note, these have been translated into French and German
- Detailed **definition of weighting factors**, both at the level of impacts and domains, and with regards to building typologies considered
- **Possible adaptations** of the methodological framework (e.g. of weighting factors) for calculating the SRI, e.g. depending on types or subtypes of buildings, or the modalities of implementation foreseen in Member States (e.g. coupling with EPC)
- **Process to review the methodology** from time to time, e.g. adding services or adjusting weightings: new guidance document, or annex containing updates.

The guidance offered in the text below addresses these in order.

3.1 OVERVIEW/DESCRIPTION OF THE SRI ASSESSMENT METHODOLOGY

The Commission Delegated Regulation (EU) 2020/2155[6] established the definition of the SRI and a common methodology by which it is to be calculated. Its first six annexes[7] provide information about: the calculation of smart readiness scores (Annex I), the smart readiness impact criteria (Annex II), the weighting of impact criteria in key functionalities (Annex III), the technical domains (Annex IV), the weighting of technical domains (Annex V), and the smart readiness rating (Annex VI).

Specifically, Article 4 of Commission Delegated Regulation (EU) 2020/2155 specifies:

> *1 The methodology for calculating the smart readiness indicator shall be based on the assessment of smart-ready services present or planned at design stage in a building or building unit, and of smart-ready services that are considered relevant for that building or building unit.*
>
> *2 The calculation of the smart readiness scores shall be based on a common Union methodological framework set out in Annexes I to VI.*
>
> *3 The standard calculation methodology set out in Annexes I to VI may be adapted in accordance with Annex VII, in particular by making a link to energy performance calculations in the scope of energy performance certification.*
>
> *4 The methodology for calculating the smart readiness indicator shall be used in accordance with the conditions set out in this Regulation, in particular regarding the qualification of experts.*
>
> *The smart readiness rating of a building or building unit shall be based on the smart readiness scores calculated for the building or building unit in accordance with Annex VIII.*

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R2155

[7] https://energy.ec.europa.eu/document/download/e6b4c362-fddc-43cf-93d2-05244479c60d_en?filename=smart_readiness_buildings_delegated_act_annex_c2020_6930.pdf

Annex I on **Calculation of smart readiness scores** stipulates that:

1. The smart readiness of a building or building unit reflects the capabilities of the building or building unit to adapt its operation to the needs of the occupants and the grid, and to improve its energy efficiency and overall in-use performance.
2. The smart readiness of a building or building unit is determined on the basis of the assessment of smart-ready services present or planned in, or relevant for, the building or building unit, and their functionality level.
3. The smart readiness of a building or building unit is expressed by a rating that derives from a total smart readiness score expressed as a percentage and that represents the ratio between the smart readiness of the building or building unit compared to the maximum smart readiness that it could reach.
4. The calculation of the smart readiness scores is based on pre-defined weighting factors in line with Annexes III, V and VII, the value of which may depend on climatic conditions and other relevant aspects, such as the type of building.
5. For expressing the smart readiness of a building or building unit, the methodology also allows the use of disaggregated smart readiness scores expressed as a percentage. The disaggregated scores may express smart readiness for one or more of the following:

(a)three key smart readiness functionalities as highlighted in point 2 of Annex Ia, to Directive 2010/31/EU:

(1)energy performance and operation;

(2)response to the needs of the occupants; and

(3) energy flexibility, including the ability of the building or building unit to enable participation in demand response.

(b) the smart readiness impact criteria as defined in Annex II to this Regulation;

(c) the smart readiness technical domains as defined in Annex IV to this Regulation.

6. The calculation of the smart readiness scores of a building or building unit relies on the assessment of the smart-ready services that are present, or planned at design stage, and on their functionality level. The assessment aims to determine with sufficient reliability what services are present or planned, and if so, the functionality level for each of those services. For this purpose, where they are available, digital models of buildings, including building information models or digital twins, may be used. The smart-ready services that can be present in a building are listed in a pre-defined smart-ready service catalogue as set out in Annex VI and are organised in pre-defined technical domains as set out in Annex IV.

7. The calculation of smart readiness scores is made in accordance with the following protocol:

(a)in accordance with the catalogue of smart-ready services as set out in Annex VI to this Regulation, for each technical domain as set out in Annex IV to this Regulation, smart-ready services that are present are assessed and, for each one, the functionality level is determined according to the catalogue of smart-ready services.

(b)in accordance with the catalogue of smart-ready services, and for each smart readiness impact criterion as set out in Annex II, the score I(d,ic) of each technical domain is determined, as follows:

$$I(d, ic) = \sum_{i=1}^{N_d} I_{ic}(FL(S_{i,d}))$$

where:

(1)d is the number of the technical domain in question,

(2)ic is the number of the impact criterion in question,

(3)N_d is the total number of services in technical domain d,

(4)$S_{i,d}$ is service i of technical domain d,

(5)$FL(S_{i,d})$ is the functionality level of service $S_{i,d}$ as available in the building or building unit,

(6)$I_{ic}(FL(S_{i,d}))$ is the score of service $S_{i,d}$ for impact criterion number ic, according to the service's functionality

level,

(c) in accordance with the catalogue of smart-ready services, the maximum score of each technical domain for each impact criterion $I_{max}(d,ic)$ is determined, as follows:

$$I_{max}(d,ic) = \sum_{i=1}^{N_d} I_{ic}(F_{max}(S_{i,d}))$$

where:

(1)$FL_{max}(S_{i,d})$ is the highest functionality level that service $S_{i,d}$ could have according to the smart-ready service catalogue,

(2)$I_{ic}(FL_{max}(S_{i,d}))$ is the score of service $S_{i,d}$ for its highest functionality level, which means the maximum score of service $S_{i,d}$ for impact criterion number ic,

(d) The smart readiness score expressed as a percentage for each of the impact criterion SR_{ic} is determined using the weighting specified in Annex V, as follows:

$$SR_{ic} = \frac{\sum_{d=1}^{N} W_{d,ic} \times (I(d,ic))}{\sum_{d=1}^{N} W_{d,ic} \times (I_{max}(d,ic))} \times 100$$

where:

(1)d is the number of the technical domain in question,

(2)N is the total number of technical domains (according to Annex IV),

(3)$W_{d,ic}$ is the weighting factor expressed as a percentage of technical domain number d for impact criterion number ic,

(e) smart readiness scores along the three key functionalities highlighted in Annex Ia, point 2 of Directive 2010/31/EU, SR_f, are determined, using the weighting factors specified according to Annex III, as follows:

$$SR_f = \sum_{ic=1}^{M} W_f(ic) \times SR_{ic}$$

where:

(1)M is the total number of impact criteria according to Annex II,

(2)$W_f(ic)$ is the weighting factor expressed in percentage of impact criterion number ic for key functionality f according to Annex III,

(3)SR_{ic} is the smart readiness score for impact criterion number ic.

(f) the total smart readiness score SR may be calculated, as a weighted sum of the key functionalities' smart readiness scores, as follows:

$$SR = \sum W_f \times SR_f$$

where:

(1)SR_f is the smart readiness score for key functionality f,

(2)W_f is the weight of key functionality f in the calculation of the total smart readiness scores, with $\Sigma W_f = 1$.

(g) smart readiness scores of technical domains for each impact criterion $SR_{d,ic}$ may be calculated, as follows:

$$SR_{d,ic} = \frac{I(d,ic)}{I_{max}(d,ic)} \times 100$$

where:

(1) I(d,ic) is the score of domain number d for impact criterion ic,

(2) I_{max}(d,ic) is the maximum score of domain number d for impact criterion number ic.

ANNEX II: Smart readiness impact criteria

The smart readiness impact criteria considered in the calculation protocol set out in Annex I are the following:

- *(a) energy efficiency,*
- *(b) maintenance and fault prediction,*
- *(c) comfort,*
- *(d) convenience,*
- *(e) health, well-being and accessibility,*
- *(f) information to occupants,*
- *(g) energy flexibility and storage.*

ANNEX III: Weighting of impact criteria in key functionalities

1. Each impact criterion set out in Annex II of this Regulation is considered for only one of the three key functionalities, as set out in points 2 to 4. For each key functionality, Member States shall define the respective weighting factors of relevant impact criteria.

2. For the 'energy performance and operation' key functionality, the relevant impact criteria are 'energy efficiency' and 'maintenance and fault prediction'.

3. For the 'response to user needs' key functionality, the relevant impact criteria are 'comfort', 'convenience', 'information to occupants' and 'health, well-being & accessibility'.

4. For the 'energy flexibility' key functionality, the relevant impact criterion is 'energy flexibility & storage'.

ANNEX IV: Technical domains

The smart readiness technical domains considered in the calculation protocol set out in Annex I to this Regulation are the following:

- *(a) heating,*
- *(b) cooling,*
- *(c) domestic hot water,*
- *(d) ventilation,*
- *(e) lighting,*
- *(f) dynamic building envelope,*
- *(g) electricity,*
- *(h) electric vehicle charging,*
- *(i) monitoring and control.*

ANNEX V: Weighting of technical domains

1. Each technical domain is weighted for each of the impact criterion and the weighting factors characterise the influence of the technical domain on the impact criterion.

2. Technical domains' weighting factors are expressed as a percentage, and for each impact criterion, the sum of the weighting factors of the technical domains equals to 100 %.

3. The standard approach to allocate weighting factors to the technical domains is based on:

(a) The climatic zone's energy balance for the weighting factors of 'heating', 'cooling', 'domestic hot water', 'ventilation', 'lighting', and 'electricity' technical domains along the 'energy efficiency', 'maintenance and prediction' and 'energy flexibility and storage' impact criteria;

(b) for all other cases: weighting factors that are either fixed or equally distributed.

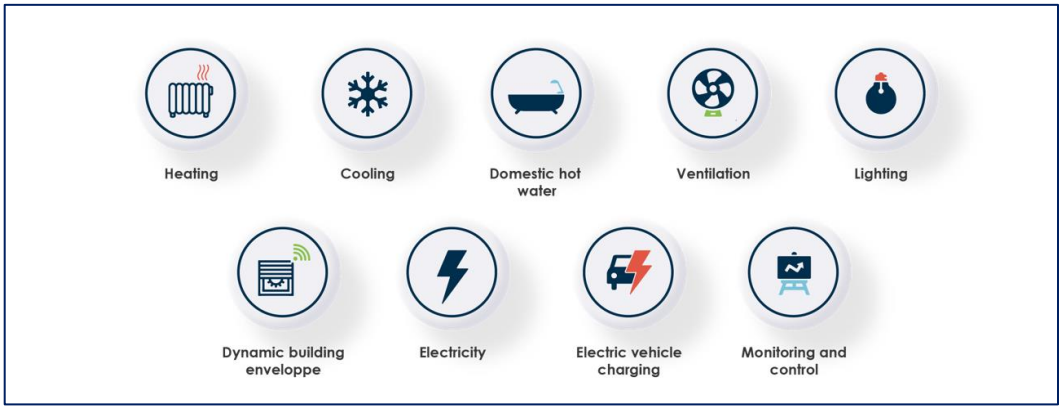
4. Member States define the climatic zones that are used, where relevant, in the determination of weighting factors. For this purpose, Member States may use, where available, relevant Union guidance.

5. The weighting factors of technical domains may differ between residential and non-residential buildings for some impact criteria.

6. Member States define the weighting factors and, for this purpose, are encouraged to use, where available, relevant Union guidance. They may also take into account possible impacts from climate change.

The methodology to calculate the SRI as set out in the delegated regulation and its annexes, is clear; however, a somewhat more accessible summary of the approach is presented below.

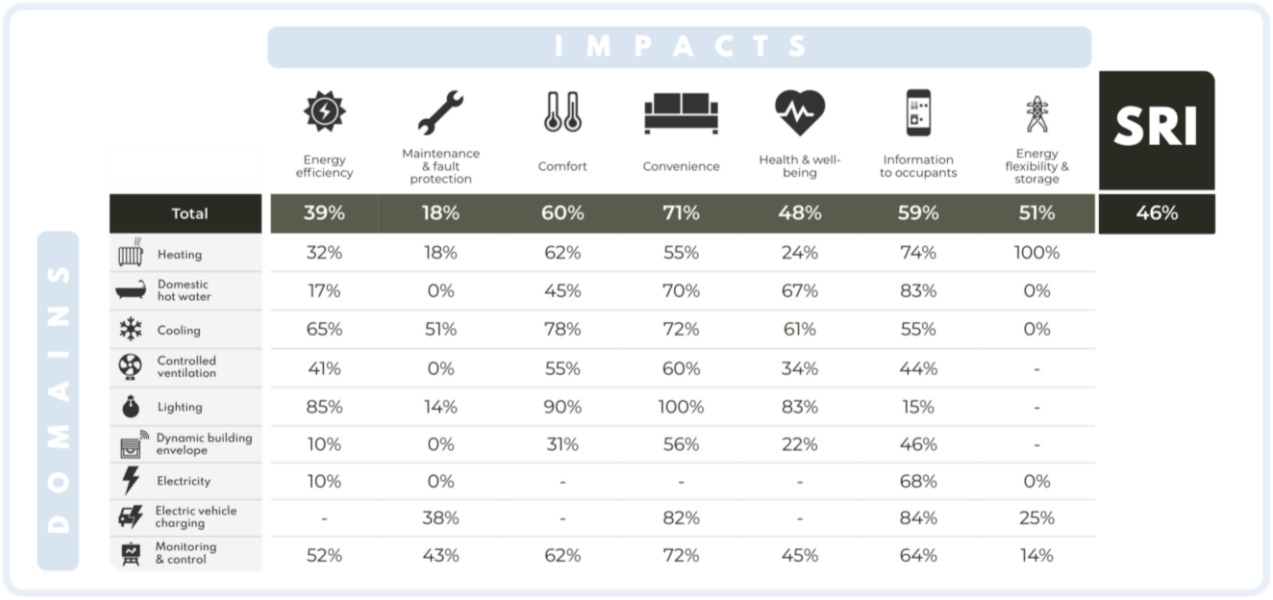
The methodology to calculate the SRI is based on the assessment of smart ready services (the level of smart functionality) within nine technical domains (per Annex IV), as shown in the following image.



The smartness of each technical domain is determined against the following seven distinct impact criteria (per Annex II):

- Energy efficiency
- Maintenance and fault prediction
- Comfort
- Convenience
- Health, well-being and accessibility
- Information to occupants
- Energy flexibility and storage.

These technical domains and impact criteria are related in an assessment matrix, as follows:



For each technical domain and impact criterion an EU-wide analysis was conducted[8] of the maximum smartness functionality that is currently available on the market, the lowest level of smartness (usually no smartness at all) and the intermediate levels. If a technical domain in a building is using the maximum smartness functionality for the given impact it scores 100% for that impact criterion; no smartness at all is scored at 0% and intermediate levels of smartness have intermediate values between 0 and 100%. If each technical domain in a building were to attain scores of 100% for a given impact criterion, then the overall score for the building would be 100% for that criterion. If the building were to score 100% for all seven impact criteria, then its overall SRI score would be 100% (the maximum currently achievable).

In reality, not all technical domains contribute equally to any given impact criterion, so weightings are applied based on the relative importance of the domain to the impact criterion (as set out in Annex V). For example, as space heating is typically around 65% of total building energy consumption then its contribution to the overall energy efficiency score would be weighted to reflect its importance, while technical domains that make a smaller contribution would have smaller weightings that are proportional to their contribution.

Annex V stipulates how the weighting of the technical domains is to be derived for each impact criterion. It stipulates that the standard approach to allocate weighting factors to the technical domains based on:

(a) The climatic zone's energy balance for the weighting factors of 'heating', 'cooling', 'domestic hot water', 'ventilation', 'lighting', and 'electricity' technical domains along the 'energy efficiency', 'maintenance and prediction' and 'energy flexibility and storage' impact criteria;

(b) for all other cases: weighting factors that are either fixed or equally distributed.

The Annex further stipulates that

- Member States define the climatic zones that are used, where relevant, in the determination of weighting factors. For this purpose, Member States may use, where available, relevant Union guidance.
- The weighting factors of technical domains may differ between residential and non-residential buildings for some impact criteria.

[8] https://op.europa.eu/en/publication-detail/-/publication/f9e6d89d-fbb1-11ea-b44f-01aa75ed71a1

- Member States define the weighting factors and, for this purpose, are encouraged to use, where available, relevant Union guidance. They may also take into account possible impacts from climate change.

Guidance on these aspects is discussed under the service catalogue discussion in section 3.2 below.

In addition, to the determination of overall scores for each impact criterion the SRI has three **key functionalities** as follows[9]:

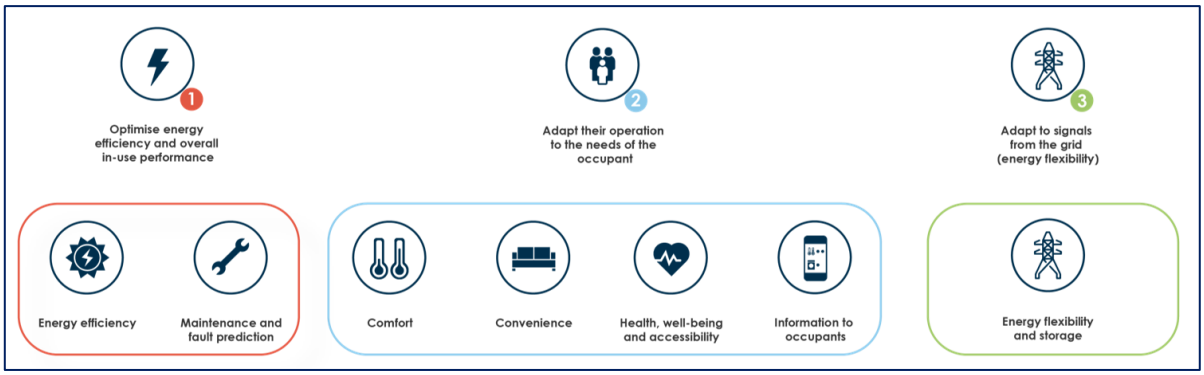
- optimise energy efficiency and overall in-use performance
- adapt operation to the needs of the occupant
- adapt to signals from the grid (energy flexibility).

As set out in Annex III, the scores for these key functionalities are derived by combining the overall impact criteria scores that pertain to each key functionality such that:

- *optimise energy efficiency and overall in-use performance* score is the weighted average combination of the overall *energy efficiency* score and the overall *maintenance and fault protection score*
- *adapt operation to the needs of the occupant* score is the weighted average of the overall scores for *comfort*, *convenience*, *health and wellbeing* and *information to occupants* scores
- *adapt to signals from the grid (energy flexibility)* score is the same as the *energy flexibility and storage* score.

Member States implementing the SRI are invited to define the weightings mentioned above; however, a priori, it is recommended that an equal weighting be given to each of the constituent impact criterion scores e.g. that for the case of the key functionality of *adapt operation to the needs of the occupant* that each of the constituent impact criterion scores would be weighted equally to determine the key functionality score, etc.

Presenting SRI scores at this level of aggregation helps to give users an intermediate aggregated overview of how well the building performs at these relatively higher levels (compared to the greater detail presented in the matrix of scores). However, it is also possible to give a (related) set of aggregated SRI scores for each impact criterion, as follows:



Note, an assessment package comprising a calculation sheet and a practical guide can be provided upon request by using this form: https://ec.europa.eu/eusurvey/runner/SRI-assessment-package.

[9] These were first set out in the 2018 revision of the EPBD - Amending Energy Performance of Buildings Directive (2018/844/EU) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.156.01.0075.01.ENG

3.2 DEFINITION OF SMART-READY CATALOGUES

As stipulated in Annex VI of the SRI Delegated Regulation[6] for national implementation of the SRI Member States will need to establish a national catalogue of smart ready services.

Specifically it states:

> *1. For the purpose of calculating smart readiness scores in accordance with the methodology set out in Annex I, Member States make available at least one smartready catalogue to be used by experts as the basis for identifying and assessing smart-ready services.*
>
> *2. A smart-ready service catalogue includes the list of smart-ready services to be considered for calculating the smart readiness score, related functionality levels, and corresponding individual scores for the impact criteria.*
>
> *3. The definition and any subsequent update of smart-ready catalogues reflect the current state of the art of smart-ready technologies.*
>
> *4. Member States are encouraged to provide guidelines to experts on the most effective way to identify and assess smart-ready services using, where available, relevant Union guidance.*
>
> *5. Member States may decide to make available several smart-ready catalogues, for instance for different building types.*

In practice it is recommended to integrate the smart ready service catalogue(s) into an assessment tool as this will facilitate the practical conduct of SRI assessments. In order to facilitate this the technical support service contract for the SRI has prepared a generic EU smart readiness assessment catalogue which aligns to the methodology set out in the delegated regulation. This catalogue is now integrated into an SRI calculation tool[10]. This calculation tool offers two methodologies:

- **Method A** – a simplified methodology
- **Method B** – a detailed methodology.

The details of this generic catalogue and how it was initially created are set out in the 2nd technical assistance study[2]. As mentioned above, an updated version, known as the SRI framework Excel tool, can be requested as part of *the SRI assessment package* which is available upon request by using this form: https://ec.europa.eu/eusurvey/runner/SRI-assessment-package. It is important to note that the SRI framework Excel calculation tool cannot be used for any formal assessment, as clearly stipulated in the terms and conditions ("Using this SRI calculation tool can by no means lead to any claims on an actual score or certificate for a building"). Thus, Member States seeking to issue formal SRI certificates will need to make their own formal calculation tools for use once the test phase is concluded. However, these may be aligned with the SRI framework Excel tool and it is recommended that they should be to the maximum extent possible once any necessary and permitted local adaptation factors have been taken into account.

Some examples of the functionalities contained in the catalogue for specific technical domains are shown in the following images. In these it can be seen that the smartness increases for the higher functionalities.

[10] Which can be requested by using this form: https://ec.europa.eu/eusurvey/runner/SRI-assessment-package – see also https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator/sri-implementation-tools_en

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	

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
V-1a	Supply air flow control at the room level	No ventilation system or manual control	Clock control	Occupancy detection control	Central Demand Control based on air quality sensors (CO2, VOC, humidity, ...)	Local Demand Control based on air quality sensors (CO2, VOC,...) with local flow from/to the zone regulated by dampers
L-1a	Occupancy control for indoor lighting	Manual on/off switch	Manual on/off switch + additional sweeping extinction signal	Automatic detection (auto on / dimmed or auto off)	Automatic detection (manual on / dimmed or auto off)	
DE-1	Window solar shading control	No sun shading or only manual operation	Motorized operation with manual control	Motorized operation with automatic control based on sensor data	Combined light/blind/HVAC control	Predictive blind control (e.g. based on weather forecast)

From non-smart... *... to maximum smartness*

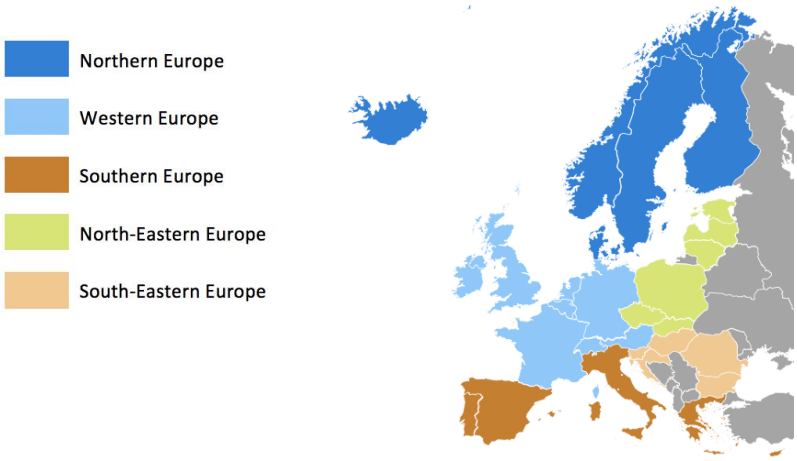
Code	Smart ready service	Functionality level 0 (default)	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4
E-2	Reporting information regarding local electricity generation	None	Current generation data available	Actual values and historical data	Performance evaluation including forecasting and/or benchmarking	Performance evaluation including forecasting and/or benchmarking; also including predictive management and fault detection
EV-15	EV Charging Capacity	Not present	Ducting (or simple power plug) available	0-9% of parking spaces has recharging points	10-50% or parking spaces has recharging point	>50% of parking spaces has recharging point
MC-25	Smart Grid Integration	None - No harmonization between grid and TBS; building is operated independently from the grid load	Demand side management possible for (some) individual TBS, but not coordinated over various domains	Coordinated demand side management of multiple TBS		

3.3 DEFINITION OF WEIGHTING FACTORS

As explained in section 3.1 the overall SRI score, the three key functionality scores and the overall impact criteria scores are derived from the matrix of technical domain and impact criteria scores. The contribution of each technical domain to each overall impact score should vary depending on the importance of each domain to the impact in question. In consequence it is necessary to apply weighting factors when creating the summed overall average score for each impact criterion. While it is technically possible to derive EU average weightings, the most appropriate weightings will be dependent on the context. For example, many building types operating in cold climates will not need space cooling and in that case space cooling could be weighted at zero (unless it is present in a building in which case its weighting could still be low but not zero). In consequence:

- five climate zones have been defined
- in the SRI calculation, weighting factors depend on the climate zone, such that:

- 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.



Aside from climate, Member States may wish to consider potentially adjusting the SRI calculation tool weightings to reflect the specific context of their building stock.

The current version of the SRI calculation tool encourages users to set the building type from the following options:

- **Residential**
- **Non-residential.**

It also allows the building usage (purpose) to be selected from the following options for residential buildings:

- **Single family house**
- **Small multi-family house: 10 residential units or less**
- **Large multi-family house: more than 10 residential units**
- **Other: student housing, care homes, etc.**

And in case of a non-residential buildings for the following options to be selected:

- **Offices**
- **Educational buildings**
- **Healthcare**
- **Other**

It proposes that the selected building type and usage will be used to determine the appropriate weighting factors, which can, for example, reflect the differences in relative importance of domains such as domestic hot water or cooling depending on the use of the building. However, in the current version, no differentiation has been made in the default weighting factors within a building type. In other words, all non-residential buildings currently use the same weighting factors, regardless of their building usage. Similarly, all residential buildings currently use the same weighting factors. Nonetheless, the calculation spreadsheet has the option to define custom weighting factors. Therefore, Member States may either wish to use the default weighting factors, or to conduct further work to define their own set of weighting factors for any key domains and impacts that are likely to be regionally/locationally sensitive.

Examples of weighting factors provided in the SRI assessment package are illustrated below, where the main differences in weighting factors have been highlighted:

For non-residential buildings in Northern Europe:

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants
Heating	31%	49%	20%	10%	25%	35%	11%
Domestic hot water	5%	8%	0%	10%	0%	6%	11%
Cooling	9%	15%	20%	10%	25%	10%	11%
Ventilation	20%	0%	20%	10%	25%	22%	11%
Lighting	8%	0%	20%	10%	0%	0%	0%
Electricity	2%	2%	0%	10%	0%	2%	11%
Dynamic building envelope	5%	0%	20%	10%	25%	5%	11%
Electric vehicle charging	0%	5%	0%	10%	0%	0%	11%
Monitoring and control	20%	20%	0%	20%	0%	20%	20%

For residential buildings in Southern Europe:

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants
Heating	32%	38%	20%	10%	25%	33%	11%
Domestic hot water	10%	12%	0%	10%	0%	10%	11%
Cooling	7%	8%	20%	10%	25%	7%	11%
Ventilation	9%	0%	20%	10%	25%	10%	11%
Lighting	3%	0%	20%	10%	0%	0%	0%
Electricity	15%	17%	0%	10%	0%	15%	11%
Dynamic building envelope	5%	0%	20%	10%	25%	5%	11%
Electric vehicle charging	0%	5%	0%	10%	0%	0%	11%
Monitoring and control	20%	20%	0%	20%	0%	20%	20%

3.4 POTENTIAL ADAPTATIONS

The use of the common SRI methodology developed at EU level is recommended, as it already considers local specificities (for instance, different climate zones are embedded within it), and it has been designed following extensive Europe-wide stakeholder consultations. However, as the smart building sector is evolving at a fast pace, elements of the common SRI methodology may be adapted to reflect local contexts and/or technological evolutions. Part of the rationale for a common EU methodology was elaborated in the 2nd technical assistance study[2] which determined that the impact of the SRI would be dependent on the combined "push" and "pull" effects that it offers. The "pull" effect is the demand for SRI certification and the impact such certification subsequently has on demand for smart services, while the "push" effect is the willingness of technical system providers to adapt their product service offers to align with the SRI functionalities and to promote them accordingly. It is important to keep in mind that the "push" effect will be much greater if there is harmonisation across the Single Market as service providers can invest in a common set of functionalities and promote them accordingly across the entire European market in a consistent manner and thereby benefit from economies of scale.

The choice between regular methods (A or B) will be informed by the perspective of the Member State undertaking the SRI test or implementation phase and how they view the value of the choice in response to their country's specificities.

In addition, the generic methodology also includes a triage process which identifies the relevant services for a specific building and adapts the methodology to the characteristics of the building. Specifically, this triage recognises that some smart services may be not be relevant for a particular building. For example, 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. The triage process allows such services to not be taken into account in the calculation. Equally, smart services can be considered relevant because they should be present (from a policy perspective). As an example: even if there is no battery storage available, the potential impacts can be taken into account when defining the maximum obtainable score.

Utilisation of a customised method is also permitted. In this case:

- the applicable services are chosen one by one in the existing service catalogue
- additional services may be defined within each technical domain.

It is a decision of Member States as to whether they will adopt such adaptations.

3.5 PROCESS TO REVIEW THE METHODOLOGY

As the methodology is based on cataloguing functions and awarding a maximum score if the maximum functionality that is currently attainable is achieved, it inherently needs to be reviewed and updated in response to technological development. As new, higher functionalities become available they will need to be documented and the scoring system adjusted to reflect their existence. In addition, the current catalogue of services is not fully comprehensive. Some services were not included in the original methodology because the means of assessing their functionality was not sufficiently mature at the time to have confidence in how they should be scored. Some were not included because the added value of their inclusion was not considered to be sufficient to justify the extra assessment effort that would be needed. This process is fully documented in the 2nd technical assistance study[2] but inevitably it represents a compromise between many factors.

Accordingly, it is necessary to establish a process to review and maintain, adapt or amend the methodology. At the European level this process will be managed through Working Group 2 of the SRI Platform. This working group is charged with the maintenance and possible extension of the SRI working methodology. The SRI platform contributes to the promotion of the SRI and related best practices. It acts as an exchange forum involving all stakeholders interested in the SRI, and a forward-looking discussion hub for technical, regulatory and implementation aspects of the SRI. The SRI platform has initiated three working groups which focus on specific elements of the SRI – the other two working groups are Working Group 1 on *Member State SRI test phase* and Working Group 3 on *The SRI value proposition and supporting measures*. The scope of each working group and the terms of reference for participation were introduced during the first plenary meeting of the SRI platform held on December 16th 2021.[11]

While the process outlined above will manage the generic EU-level methodology individual Member States may also wish to conduct a complementary process at their jurisdictional level. This could be especially important if any significant adaptations have been made to the generic EU level methodology.

[11] Recording, presentations and report of the event are available at https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator/stakeholders-events-and-news_en

4 FORMAT OF THE SRI CERTIFICATES

This chapter presents guidance on

- **design options** of the SRI certificates (section 4.1)
- summary of **accompanying information** to be issued together with SRI certificates (section 4.2)
- as well as findings from a **certificate design survey** (section 4.3).

The delegated regulation[6] of the SRI requires the issuance of certificates. These may be voluntary during the national test phases but are required during the actual implementation phase.

Specifically, Article 7 on the *Smart readiness indicator certificate* states:

> *1. The smart readiness indicator of a building or building unit shall be communicated to economic operators and other interested parties in a certificate.*
>
> *2. The smart readiness indicator certificate shall include the information specified in Annex IX.*
>
> *Where Annex IX on the Content of the smart readiness indicator certificate states:*
>
> *The information contained in the smart readiness indicator and conveyed to the end user includes the following:*
>
> *(a) unique ID of the certificate,*
>
> *(b) date of issue and date of expiry of the certificate,*
>
> *(c) an informational text clarifying the scope of the smart readiness indicator, in particular with regard to energy performance certificates,*
>
> *(d) general information on the building or building unit (type of building or building unit, surface area, year of construction and where relevant, of renovation, location),*
>
> *(e) where available, the energy performance class of the building or building unit as specified by a valid energy performance certificate,*
>
> *(f) smart readiness class of the building or building unit,*
>
> *(g) optionally, total smart readiness score of the building or building unit,*
>
> *(h) smart readiness scores along the three key functionalities highlighted in Annex I of this Regulation,*
>
> *(i) smart readiness score per impact criterion,*
>
> *(j) optionally, scores of each technical domain for each impact criterion,*
>
> *(k) where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label,*
>
> *(l) where possible, available information on interoperability, cybersecurity of systems and data protection, including where relevant on conformity to commonly agreed standards, and information on related risks,*
>
> *(m) an informational text clarifying that the certificate reflects the smart readiness at the date of issuance and that any significant modifications to the building and its systems would affect smart readiness and would therefore require an update of the information given on the certificate,*
>
> *(n) optionally, recommendations on how to improve the smart readiness of the building or building unit taking into account, where relevant, the heritage value.*
>
> *(o) optionally, additional information on the assumptions made in the calculation of scores such as weighting factors of impact criteria used for calculating smart readiness scores for key functionalities.*

Member States will need to consider the most appropriate formats for these certificates but in anticipation of this the current SRI service contract has conducted work on the design of SRI certificates that aims to assist Member States with their own thinking with regard to certificate formats and is presented in sections 4.1 to 4.3.

4.1 DESIGN OPTIONS OF THE SRI CERTIFICATES

The SRI is a common EU initiative and concept that allows considerable freedom in how it is communicated within Member States providing that the certificate designs abide by the conditions set out in the Delegated regulation of the SRI[6,7]. Specifically the annex[2] of the Delegated regulation specifies a number of aspects with regard to the SRI certificate that are either:

- obligatory
- conditional, or
- optional

as shown in the table below.

Aspect mentioned in the Annex	Mandatory	Optional	Conditional	Could be taken from SRI 2?	Source
(a) unique ID of the certificate,	✓				
(b) date of issue and date of expiry of the certificate,	✓				
(c) an informational text clarifying the scope of the smart readiness indicator, in particular with regard to energy performance certificates,	✓				
(d) general information on the building or building unit (type of building or building unit, surface area, year of construction and where relevant, of renovation, location),	✓				
(e) where available, the energy performance class of the building or building unit as specified by a valid energy performance certificate,			✓		EPC
(f) *smart readiness class* of the building or building unit,	✓			7-scale grades	
(g) optionally, total smart readiness score of the building or building unit,		✓		✓	
(h) smart readiness scores along the three key functionalities highlighted in Annex I of this Regulation,	✓			✓	
(i) smart readiness score per impact criterion,	✓			✓	
(j) optionally, scores of each technical domain for each impact criterion,		✓		✓	
(k) where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label,		✓	✓		
(l) where possible, available information on interoperability, cybersecurity of systems and data protection, including where relevant on conformity to commonly agreed standards, and information on related risks,			✓		
(m) an informational text clarifying that the certificate reflects the smart readiness at the date of issuance and that any significant modifications to the building and its systems would affect smart readiness and would therefore require an update of the information given on the certificate,	✓				
(n) optionally, recommendations on how to improve the smart readiness of the building or building unit taking into account, where relevant, the heritage value.		✓			
(o) optionally, additional information on the assumptions made in the calculation of scores such as weighting factors of impact criteria used for calculating smart readiness scores for key functionalities.		✓			

Key: Orange highlighted is mandatory; Yellow highlighted is optional; Green highlighted is conditional

The mandatory aspects need to be included in all SRI certificates that Member State might issue. They include routine provenance and traceability information such as a unique certificate ID and information on the date of issue/expiration of the certificate. They also include a requirement to include informational text that will clarify the scope of the SRI and how it is differentiated from EPCs. The last mandatory aspect mentioned is text to inform the user that the certificate reflects the SRI status of the building at the time it was issued and that subsequent modifications to the building and its systems could alter the SRI scores and hence necessitate issuance of a new certificate if their impacts are to be certified.

Once the SRI's scope has been made clear to certificate users then arguably the most impactful aspect of the certificate is the ranking information. Three aspects are mandatory (i.e. they have to be conveyed in any SRI certificate) as follows:

- **smart readiness class** of the building or building unit[12]

[12] Annex VIII to the delegated regulation[7] defines 7 SRI classes in the range of overall SRI scores of: 90 – 100 %; 80 – 90 %; 65 – 80 %; 50 - 65 %; 35 – 50 %; 20 – 35 %; < 20 %

- **smart readiness scores of the three key functionalities** highlighted in Annex I of the SRI delegated regulation[7]
- **smart readiness score per impact criterion** (there are seven impact criteria).

The smart readiness class is defined in Annex VIII of the delegated regulation[7]. While seven classes are defined the classes are not named, so Member States have freedom in how they choose to nominate these classes.

The smart readiness scores for the three key functionalities highlighted in Annex I (namely, energy efficiency and maintenance; comfort, convenience, health & wellbeing; and energy flexibility & storage) are all numerical percentage scores i.e. expressed on a scale of 0 to 100%.

The smart readiness score per impact criterion (of which there are seven) are also expressed as percentage scores i.e. expressed on a scale of 0 to 100%. The seven impact criteria (as mentioned earlier) are:

- Energy efficiency
- Maintenance and fault prediction
- Comfort
- Convenience
- Health, well-being and accessibility
- Information to occupants
- Energy flexibility and storage.

4.1.1 Relevant design findings from the 2nd technical assistance study

4.1.1.1 Naming the classes

For them to have any salience Member States will need to give a name to the seven SRI classes used on the certificate. It is noted that the EU energy label, which itself draws upon cultural familiarity with existing alphabetical grading systems used across Europe, also uses seven classes in an A to G scale. Thus, while it is not specified in the Delegated Regulation that an A-G scale should be used – such a mnemonic scale could be applied with confidence that end-users and other market actors would readily comprehend it. This notion was tested in consumer focus groups conducted under the 2nd technical assistance study[2] and respondents indicated that the A to G scale was easily comprehensible and that they saw no potential confusion with the use of such scales for other purposes, such as within EPCs. Equally, it is possible to adapt the class names to convey a slightly different sense of how positive/negatively the class should be perceived. For example, it might be opted to name D as the lowest class, A the fourth, and A+++ the highest in order to imply that a middling score is already quite good compared to the average of the current building stock. In principle, other naming conventions could be used too.

4.1.1.2 Communicating the various layers of ranking information

From an information communication perspective there is a challenge to convey the class (on a 7 point mnemonic scale), the percentage scores of the three key functionalities and of the seven impact criteria because at face value there could appear to be three distinct scoring systems.

This issue was probed, somewhat indirectly, during the focus groups conducted in the 2nd technical assistance study[2]. From this it was found that comprehension was improved when the relationship between the class and the overall score was made explicit through the graphic design choices. Similarly, comprehension of the overall score and how it relates to the three key functionality and impact scores was improved when the overall matrix of domain and impact criteria scores was shown. Both the overall score and the matrix of domain and impact criteria scores are optional information under the delegated

regulation[6,7], but as their presentation could potentially assist with comprehension and add extra informational value it is likely to be useful to include these aspects.

A key aspect to consider is that each user of the SRI is likely to be interested and motivated by different aspects of smart building performance (this was confirmed in the focus groups). Thus, while aggregate information, such as the overall score, the class, or three key functionality scores gives an entry point when discussing a building's smartness it could be too distant from the factors that each user may find motivating and also too distant from the individual domains for users to then understand in what way their building's smartness could be improved. Thus, presenting the information at a finer level via the matrix of scores could greatly assist users in engaging with the SRI. See also the findings from the certificate design survey reported in section 4.3.

4.2 SUMMARY OF ACCOMPANYING INFORMATION

As mentioned in section 4.1 the annex to the delegated regulation[6] stipulates sets of informational items that either should be included in the certificate, could be included if they are available, or are optional to include when they are available.

The required informational items are:

> *(c) an informational text clarifying the scope of the smart readiness indicator, in particular with regard to energy performance certificates*
>
> *(d) general information on the building or building unit (type of building or building unit, surface area, year of construction and where relevant, of renovation, location)*
>
> *(m) an informational text clarifying that the certificate reflects the smart readiness at the date of issuance and that any significant modifications to the building and its systems would affect smart readiness and would therefore require an update of the information given on the certificate.*

Of these c) is probably the most challenging aspect to convey. It should be noted that because of its origin via the Energy Performance in Buildings Directive, the scope of the SRI does not include several aspects of building smartness that are likely to be pertinent to end-users. In particular, it doesn't address smartness related to:

- Security
- Fire or other safety aspects
- Assisted living and smart services for elderly or disabled people
- Entertainment
- Aesthetics.

It is advisable to make its limitations of scope clear through explanatory text on the certificate to avoid misunderstanding and accusation of misrepresentation.

It is also important to explain what is meant by "Smart Ready" i.e. that the SRI is a measure of the extent by which a building is ready to provide a level of smartness but clarify that in some instances (notably demand flexibility) it may not yet be doing so because an actor external to the building (e.g. a utility) would need to provide a related service to activate the functionality.

The conditional (and optional) items mention in the delegated regulation[6,7] are:

> *(e) where available, the energy performance class of the building or building unit as specified by a valid energy performance certificate*
>
> *(k) where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label*

(l) where possible, available information on interoperability, cybersecurity of systems and data protection, including where relevant on conformity to commonly agreed standards, and information on related risks

The energy performance class as assessed through an Energy Performance Certificate will be available for many, if not the majority, of buildings that are assessed for the SRI. Indeed, buildings could even be assessed for both aspects simultaneously (see the discussion in section 7). Thus, it is appropriate for the SRI certificate to at least reference the EPC class when this information is known and to consider adding information to make clear how the EPC scope (and building energy performance class) and SRI scope (and SRI class) are distinct from each other but complementary sets of information on building performance.

The means of collecting information on Items k) and l) are discussed in section 5.2. How best to present this information will depend on the expectation of what form it could be available in.

The optional information items mentioned in the delegated regulation[6,7 7] are:

(n) optionally, recommendations on how to improve the smart readiness of the building or building unit taking into account, where relevant, the heritage value

(o) optionally, additional information on the assumptions made in the calculation of scores such as weighting factors of impact criteria used for calculating smart readiness scores for key functionalities.

Both of these sets of optional information are very likely to be important with regard to the salience and value of the SRI for users but neither are simple to convey. When providing recommendations on how to improve the smart readiness of a building there are a great many factors that could be communicated; however, their pertinence is likely to be quite dependent on the subjective interests of the certificate user. This issue was probed to some extent in the consumer focus groups conducted under the 2nd technical assistance study[2] and it was found that users were broadly in favour of a hybrid physical and online informational system that would allow them to explore the options of interest to them. Thus, ideally a user who wanted to understand more about the functionalities that a building has (and associated SRI scores) and the functionalities it could potentially have were a technical system to be upgraded would be able to explore these aspects interactively on a nested website. One way of doing this would be to show the matrix of technical domain and impact scores online and invite users to click cells of interest to understand more. Once a specific cell was clicked a nested explanation would be given of each specific functionality that could be provided the score they would attain for the technical domain and impact criterion in question. In this way users would be able to see their own score and understand the functionality they currently have, but also see the functionalities they could have were they to upgrade the smartness of their technical system. In cases where a user's certificate is issued electronically and stored in a central database it would be technically feasible to allow users to see their own building's functionalities and scores within such a matrix; however, this would obviously need to be managed in a cybersecure manner to ensure only authorised users could view the building's details. In this case, it would also be possible to use the tool to generate the certificate in the first instance – i.e. an assessor could enter the building details into the online tool which would automatically generate and issue the certificate; and at a subsequent time the certificate user could access the same tool to see their building's details and receive information on how the scores are determined and how they could upgrade their functionalities and SRI scores. However, it is equally possible to have an online support system that neither has the details of any specific building nor helps generate the certificate but simply allows users to understand what the scores they have mean (i.e. what functionalities they correspond to) and how they can improve the functionalities and scores.

The same online support tool could potentially be used provide additional information on the assumptions made in the calculation of scores such as weighting factors of impact criteria used for calculating smart readiness scores for key functionalities.

In principle, much or all of this information could also be presented via a hard copy certificate; however, if this information were to be as comprehensive or flexible for the user it would make the hard copies very long and this is probably not ideal. One option, where online support is not preferred for whatever reason, would be to present a few highlights of improvement options per impact criterion.

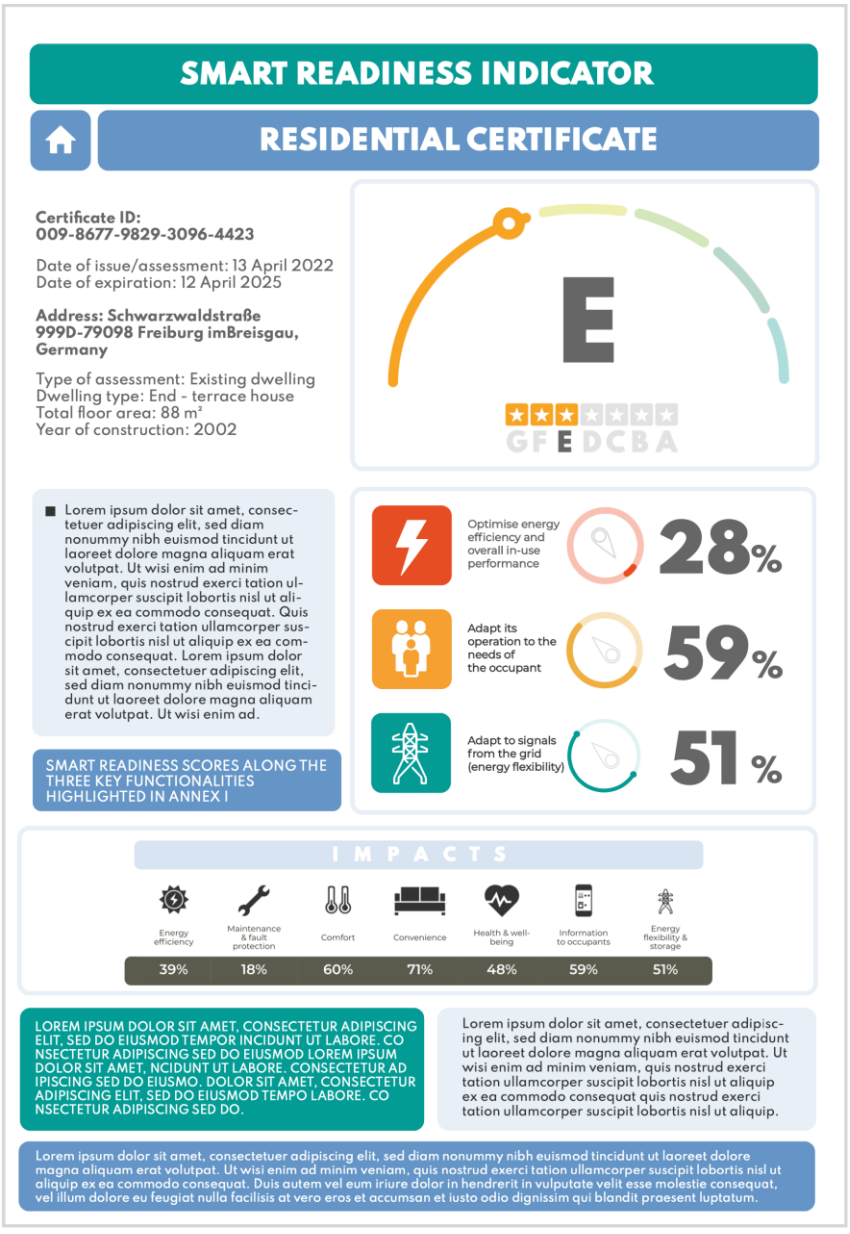
4.3 FINDINGS FROM A CERTIFICATE DESIGN SURVEY

To help provide guidance to Member States setting out to design SRI certificates an online certificate design survey has been conducted under the auspices of the ongoing SRI support service contract. The findings from 71 completed surveys have been processed and are presented in the rest of this section. The survey is targeted at professional stakeholders across Europe – especially: EPC assessors, estate agents and facility managers, and hence is intended to complement the findings of the consumer surveys conducted under the 2nd technical assistance study[2] as discussed in section 4.2.

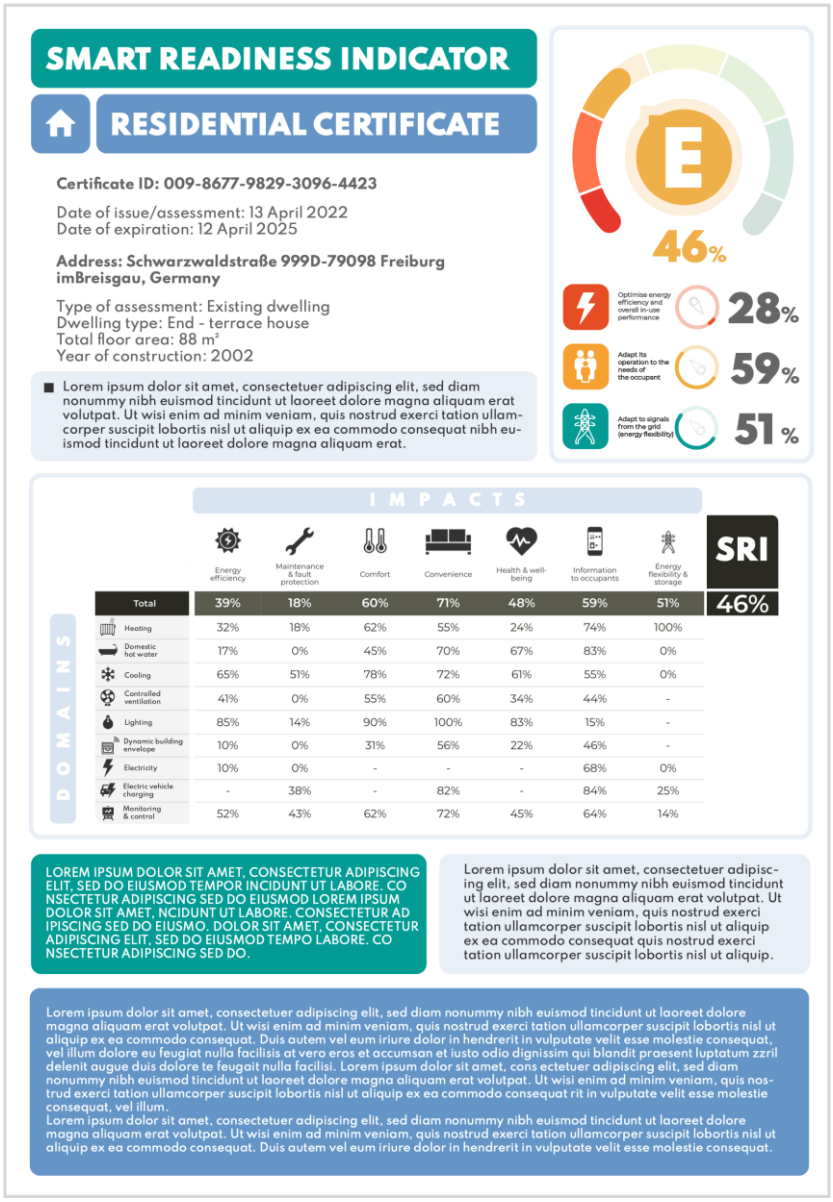
The figures further below show the responses received to each question asked (shown in the figure caption). Two illustrative certificate designs were produced to help probe design issues of interest and were complemented by additional sub-element designs when needed. The findings are now presented and discussed.

The following text was shown to the respondents. "Shown below are two different illustrative SRI certificate design concepts: Design 1 and Design 2. Please note that these designs only show the front side of a certificate and that more information could be included elsewhere."

Design 1



Design 2


SMART READINESS INDICATOR
RESIDENTIAL CERTIFICATE
Certificate ID: 009-8677-9829-3096-4423
Date of issue/assessment: 13 April 2022
Date of expiration: 12 April 2025
Address: Schwarzwaldstraße 999D-79098 Freiburg imBreisgau, Germany
Type of assessment: Existing dwelling
Dwelling type: End - terrace house
Total floor area: 88 m²
Year of construction: 2002
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E
46%
28%
59%
51 %
IMPACTS
SRI
Energy efficiency
Maintenance & fault protection
Comfort
Convenience
Health & well-being
Information to occupants
Energy flexibility & storage
DOMAINS
Total 39% 18% 60% 71% 48% 59% 51% 46%
Heating 32% 18% 62% 55% 24% 74% 100%
Domestic hot water 17% 0% 45% 70% 67% 83% 0%
Cooling 65% 51% 78% 72% 61% 55% 0%
Controlled ventilation 41% 0% 55% 60% 34% 44% -
Lighting 85% 14% 90% 100% 83% 15% -
Dynamic building envelope 10% 0% 31% 56% 22% 46% -
Electricity 10% 0% - - - 68% 0%
Electric vehicle charging - 38% - 82% - 84% 25%
Monitoring & control 52% 43% 62% 72% 45% 64% 14%
LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT, SED DO EIUSMOD TEMPOR INCIDUNT UT LABORE. CO NSECTETUR ADIPISCING SED DO EIUSMOD LOREM IPSUM DOLOR SIT AMET, NCIDUNT UT LABORE. CONSECTETUR AD IPISCING SED DO EIUSMO. DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT, SED DO EIUSMOD TEMPO LABORE. CO NSECTETUR ADIPISCING SED DO.
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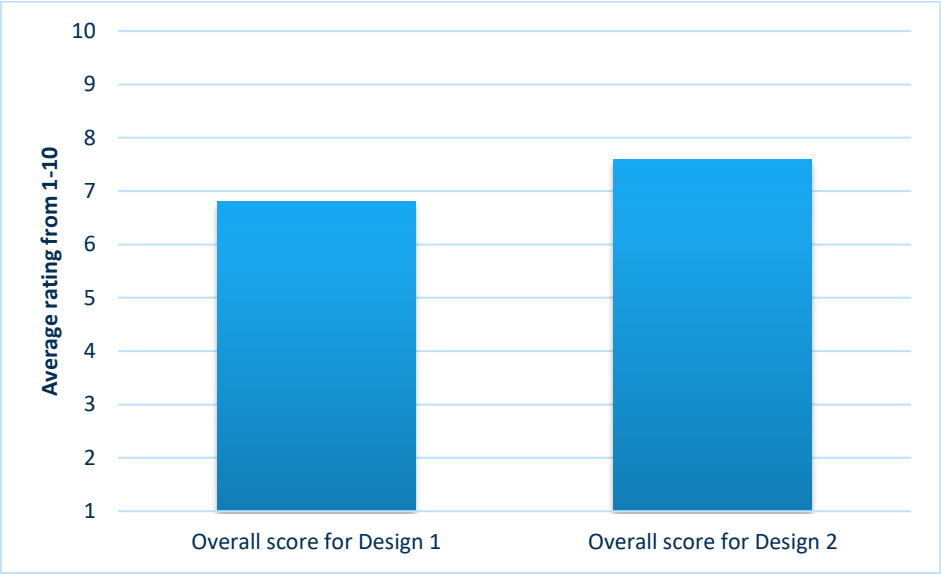
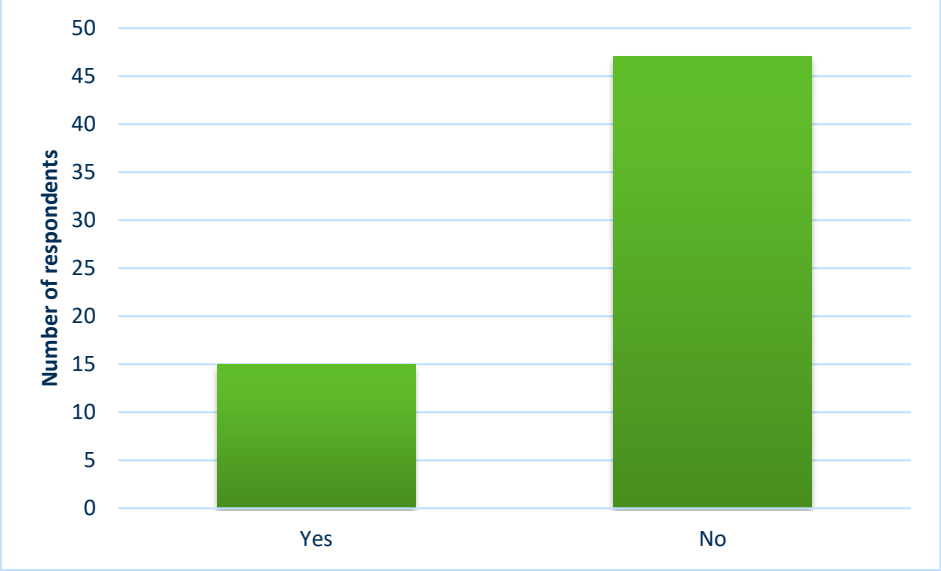
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero eros et accumsan et iusto odio dignissim qui blandit praesent luptatum zzril delenit augue duis dolore te feugait nulla facilisi. Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat rit in vulputate velit esse molestie consequat, vel illum.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat.

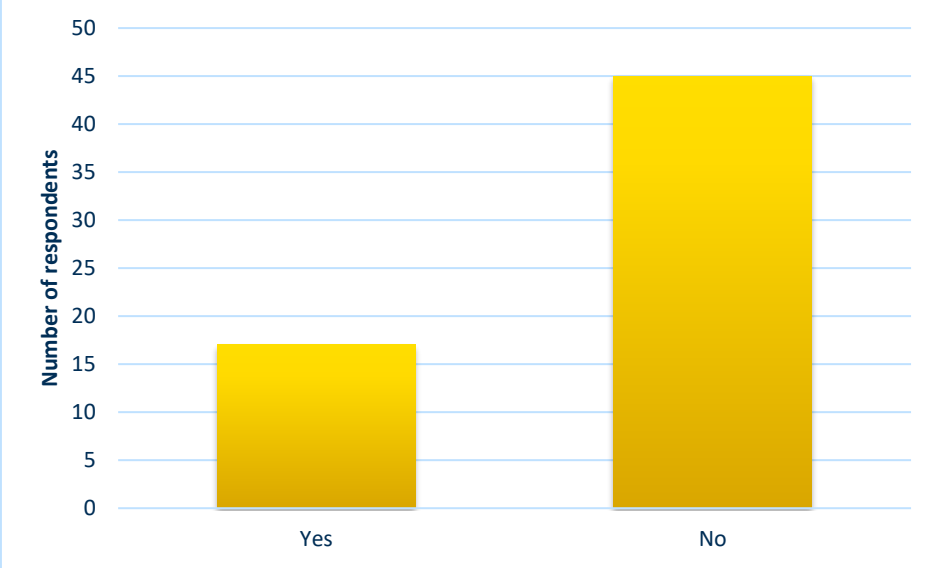
a) What Is your level of satisfaction with the graphic design, colours and overall appearance of Design 1 and Design 2?



b) Do you have any further comments on the structure of the content (i.e., where the information is represented, and/or how is it aggregated)?



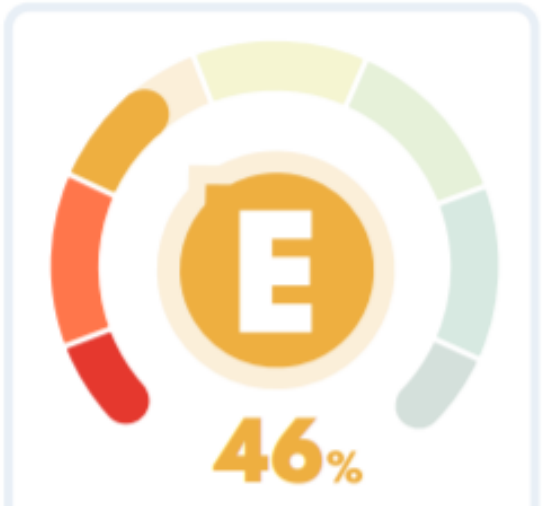
c) Do you have any further comments on the readability of the pictograms (graphics, stars…)?



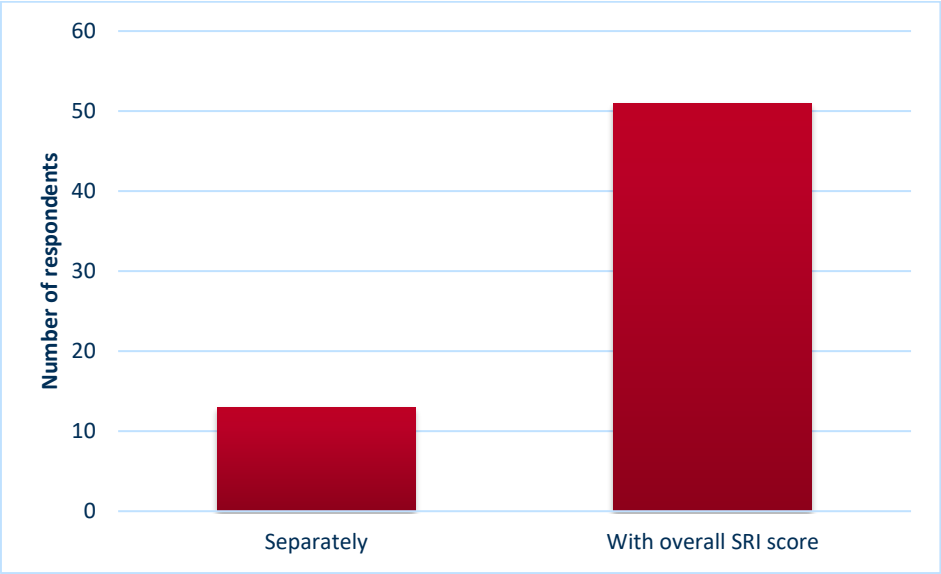
Participants were told to note that the SRI Delegated Regulation[6] requires the following information on the SRI scoring to be displayed:

- the SRI class (which is determined from the building's overall SRI score on a seven-grade scale e.g. A to G, or Seven stars to 1 star)
- the SRI scores, expressed as percentage values, for the three key functionalities
- the SRI scores, expressed as percentage values, for each of the 7 impact criteria.

When shown the following two design options respondents were asked:

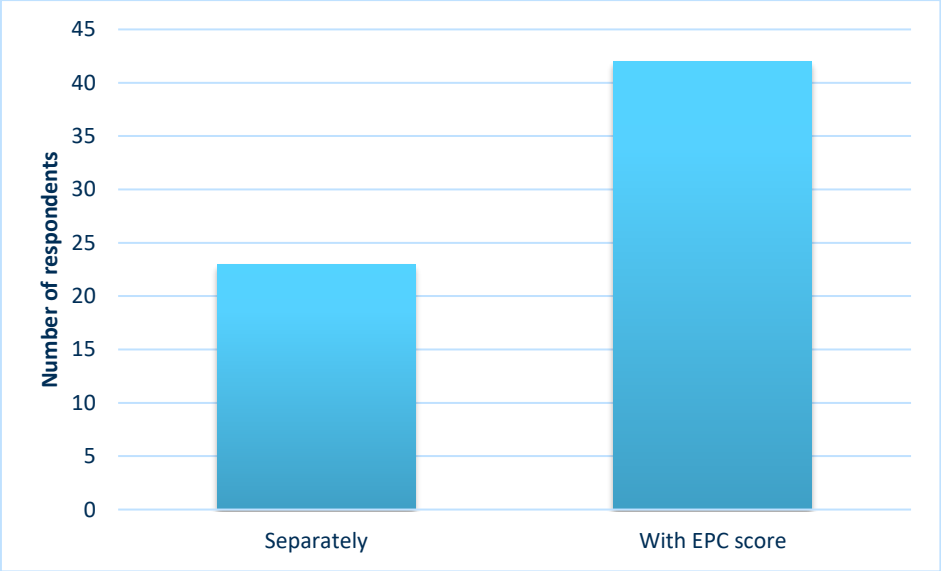
	
Option 1	*Option 2*

d) Is it best to show the overall SRI class separately (e.g., Option 1) or with the overall SRI score too (e.g., Option 2)?



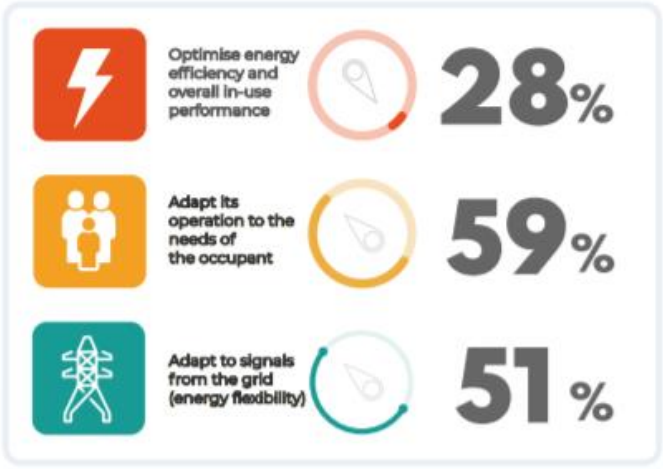
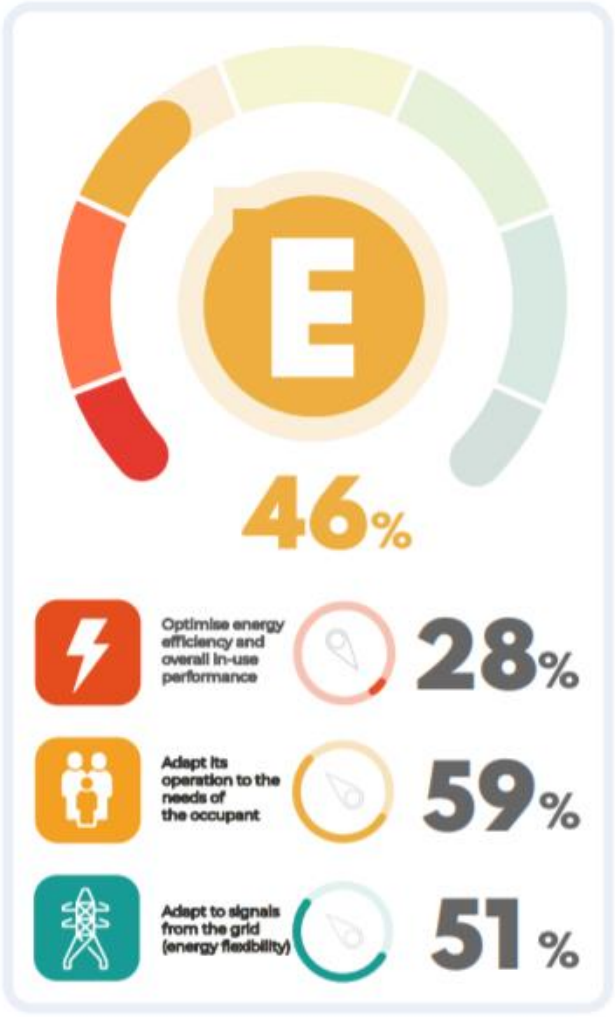
From this it can be concluded that, the respondents very strongly prefer the option where the building's SRI class (mandatory) is shown with the building's overall SRI score (optional).

e) Is it best to show the overall SRI class separately or with the Energy Performance Certificate score too?

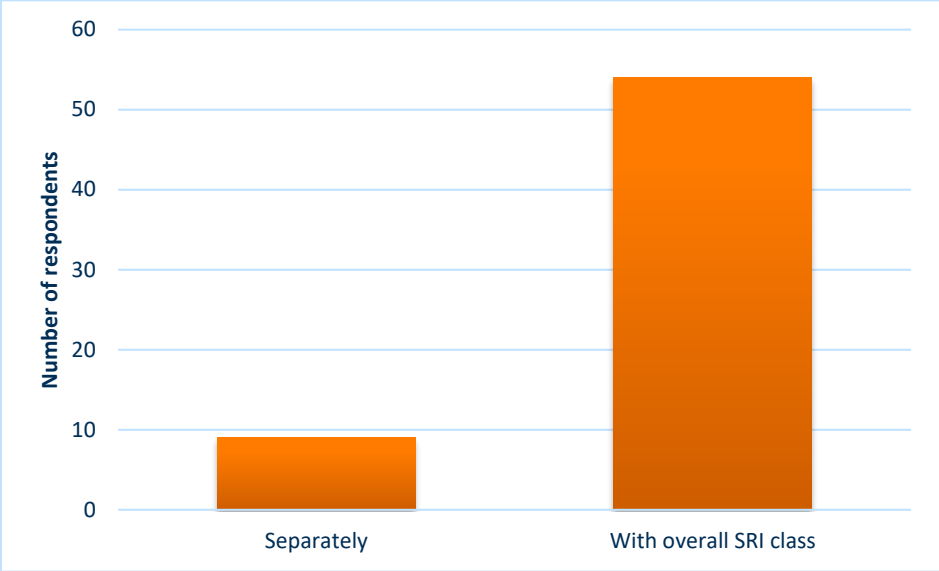


Thus, the respondents strongly prefer the option where the building's SRI class (mandatory) is shown with the building's EPC score (optional).

When shown the following two design options respondents were asked:

	
Option 1	*Option 2*

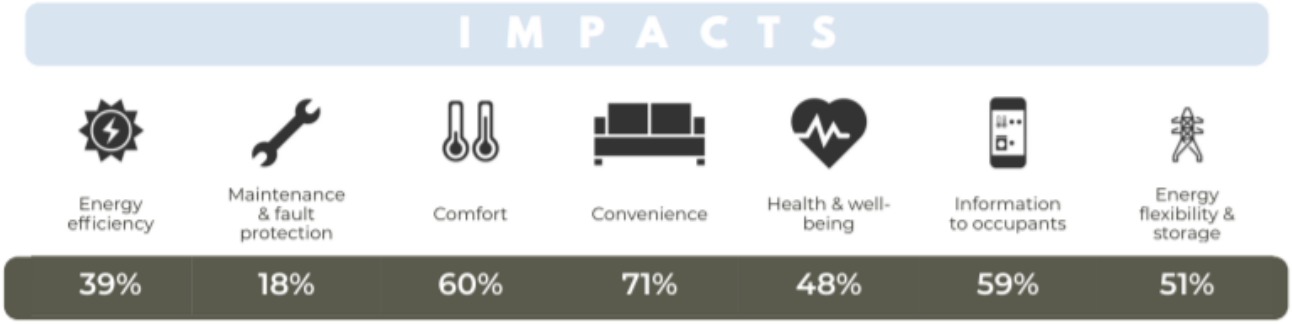
f) Is it best to show the three key functionality scores separately (e.g., Option 1) or with the overall SRI class (e.g., Option 2)?



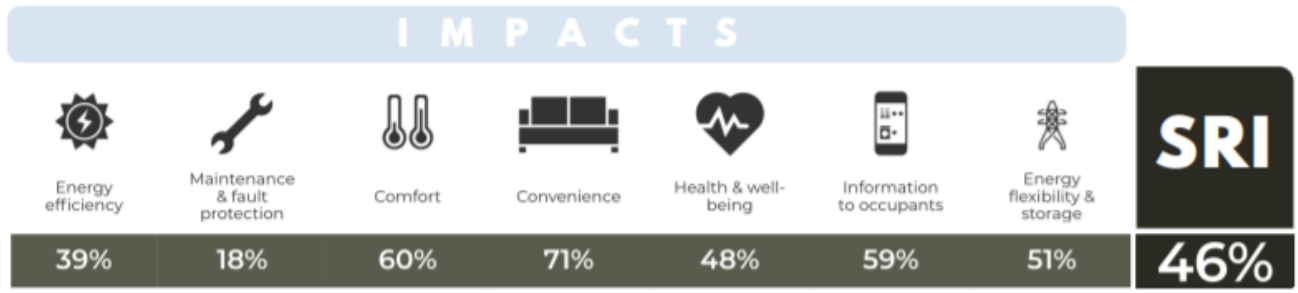
From this it can be concluded that, the respondents very strongly prefer the option where the building's SRI class (mandatory) is shown as part of an integrated design with the building's three key functionality scores (mandatory).

When shown the following two design options respondents were asked:

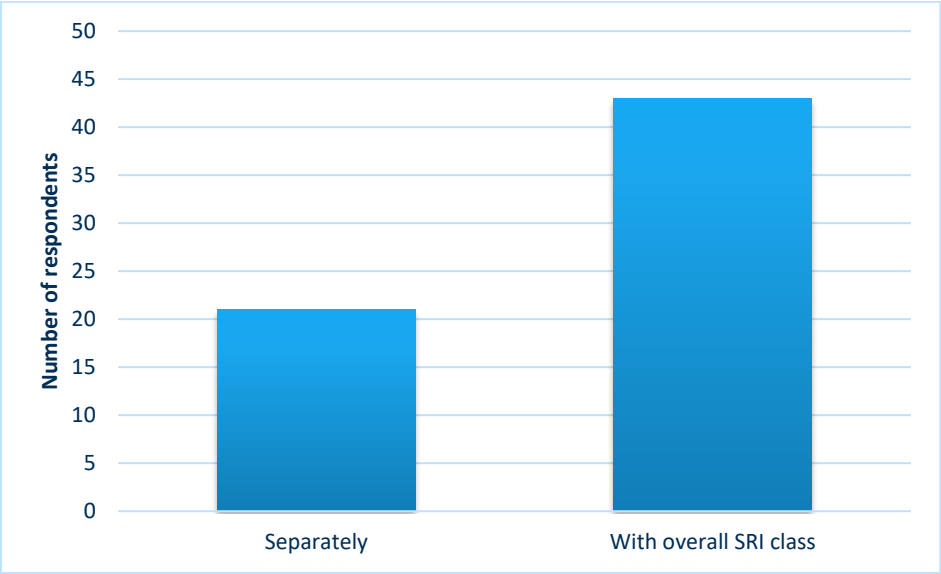
Option 1



Option 2



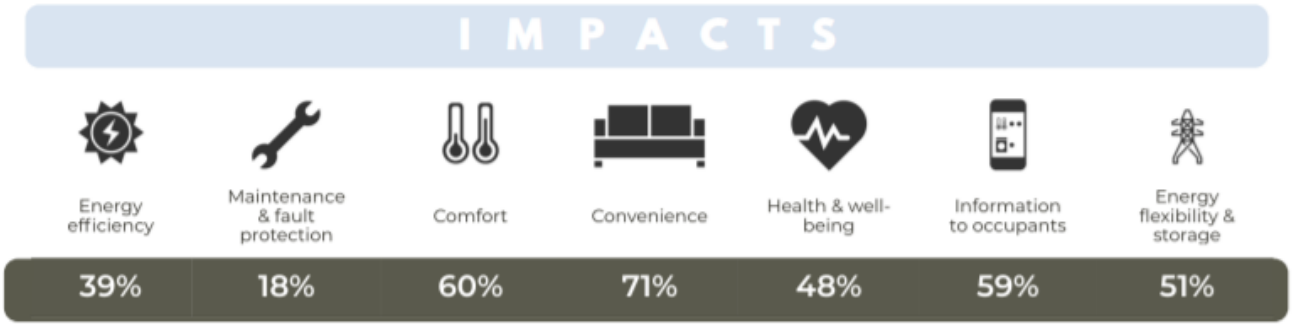
h) Is it best to show the individual impact scores separately (e.g., Option 1) or with the overall SRI class (e.g., Option 2)?



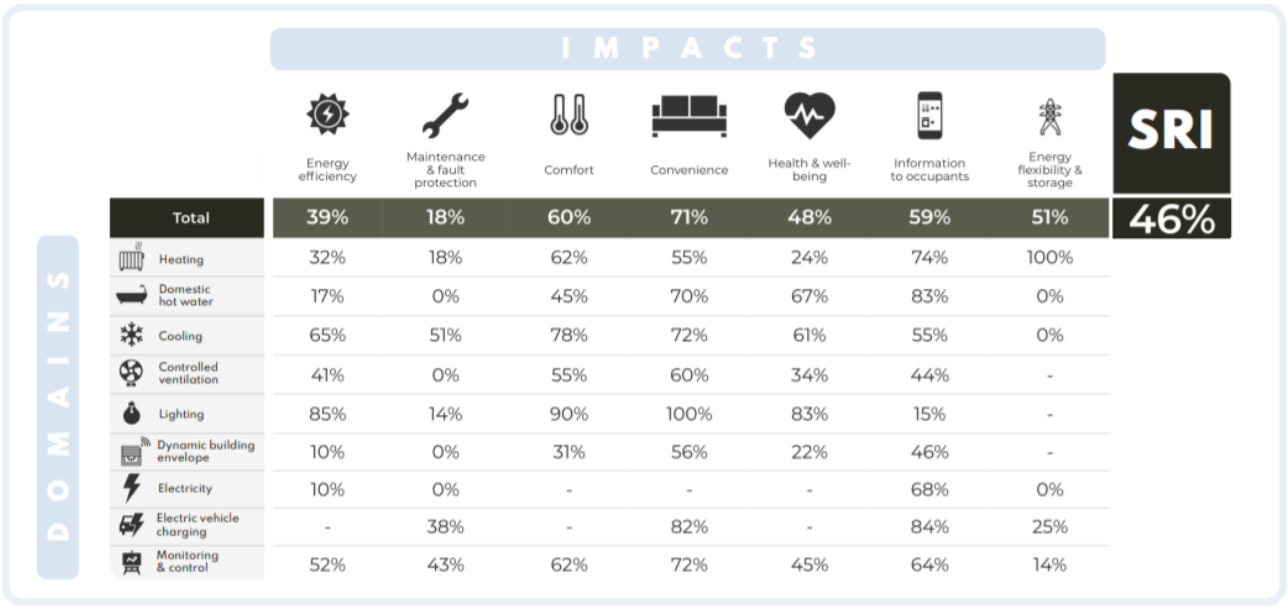
Thus, the respondents strongly prefer the option where the building's impact scores (mandatory) are shown in an integrated design with the building's overall SRI score (optional).

When shown the following two design options respondents were asked:

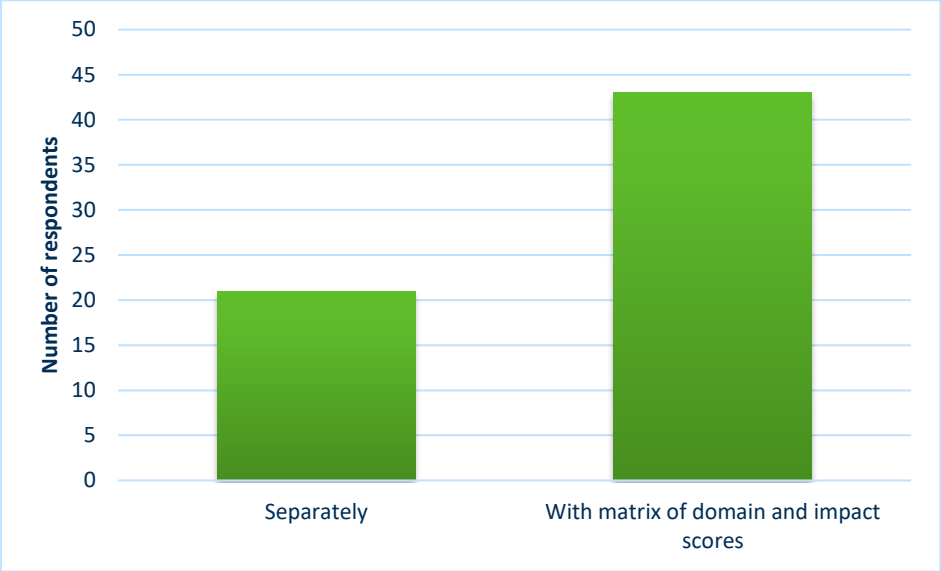
Option 1



Option 2

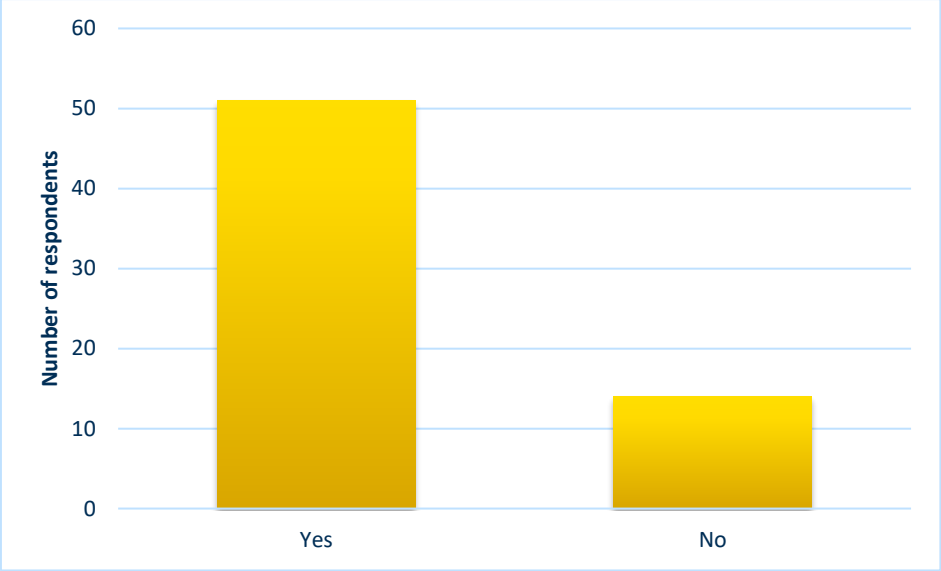


i) Is it best to show the individual impact scores separately (e.g. Option 1) or with the matrix of domain and impact scores from which they are derived (e.g. Option 2)?



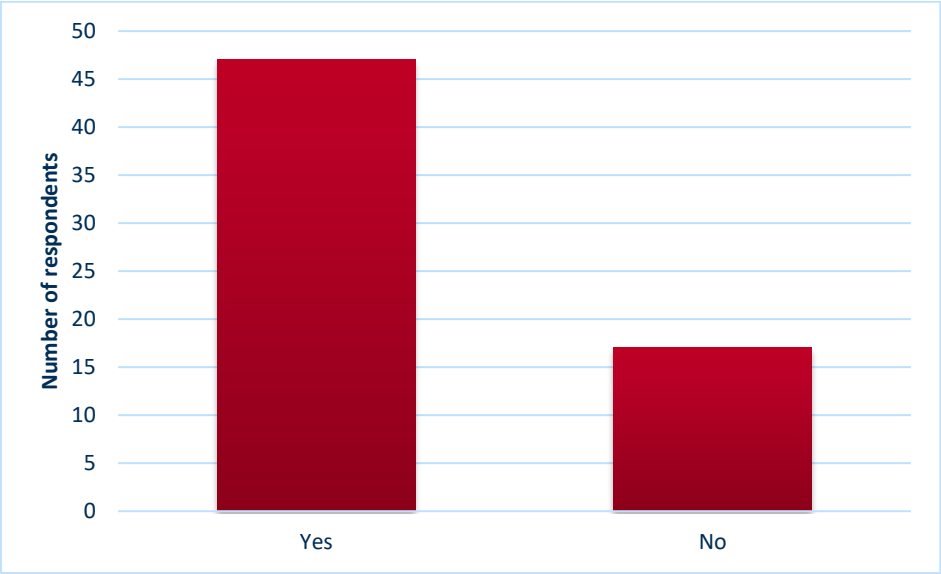
Thus, the respondents strongly prefer the option where the building's individual SRI impact scores (mandatory) are shown as part of an integrated design with the matrix of technical domain and impact scores (optional).

j) Do you think the matrix of domain and impact scores (indicated in Option 2) should be shown on the certificate at all?



From this it can be concluded that the respondents strongly prefer that the matrix of technical domain and impact scores (optional) is shown on the certificate.

k) Is it helpful to include the overall SRI score in the matrix of domain and impact scores (as shown in Option 2)?



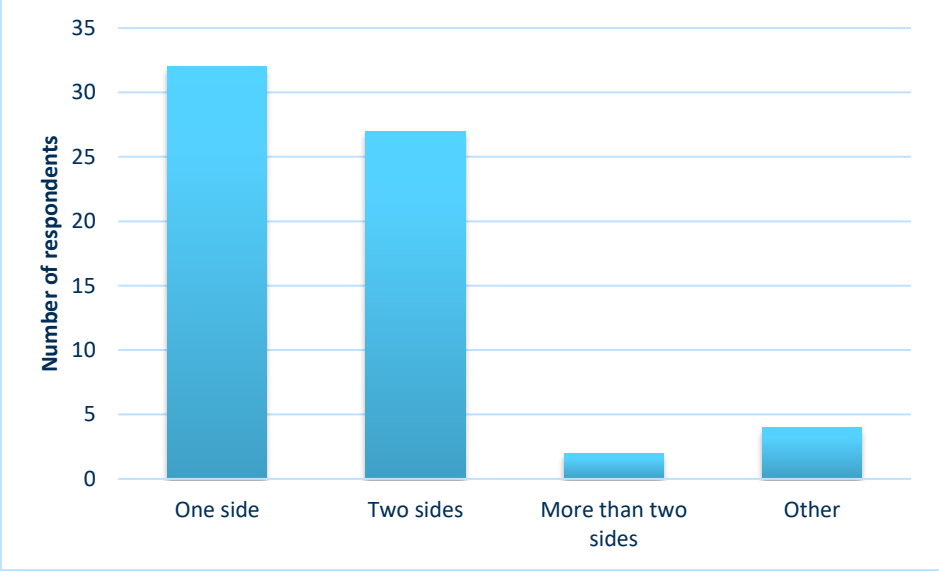
Thus, the respondents strongly prefer that the matrix of technical domain and impact scores (optional) is shown on the certificate in an integrated design that also shows the overall SRI score (optional).

Participants were informed that the SRI certificates must also include:

- unique ID of the certificate
- date of issue and date of expiry of the certificate
- informational text clarifying the scope of the smart readiness indicator, in particular with regard to energy performance certificates
- general information on the building or building unit (type of building or building unit, surface area, year of construction and where relevant, of renovation, location)
- informational text clarifying that the certificate reflects the smart readiness at the date of issuance and that any significant modifications to the building and its systems would affect smart readiness and would therefore require an update of the information given on the certificate.

They were then asked:

l) What length should the certificates be?

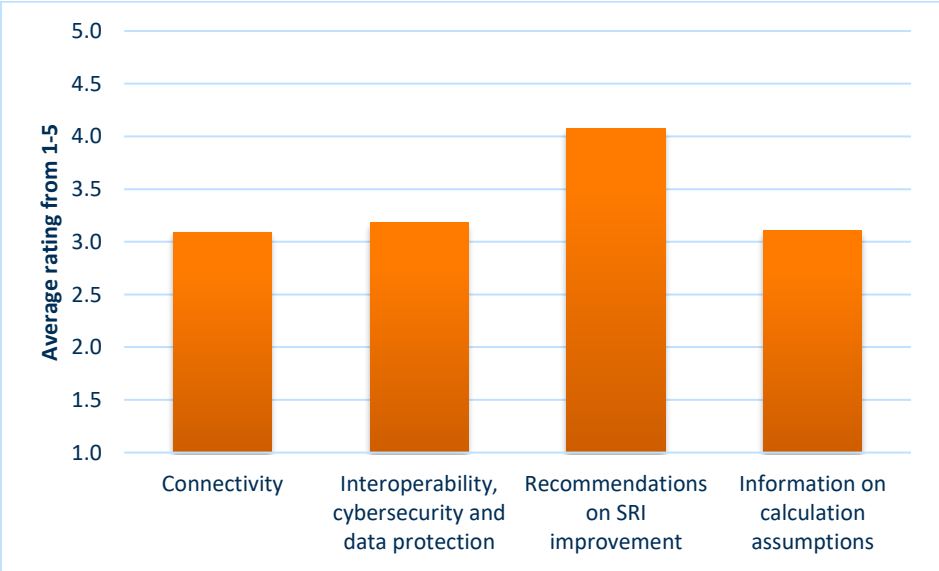


Thus, respondents very strongly prefer that the certificate be no more than 2 sides in length with a slight preference to keep it to 1 side.

Participants were informed that the following information is optional to be included in the SRI certificates before being asked to indicate the importance of their being included:

- Where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label
- Where possible, available information on interoperability, cybersecurity of systems and data protection, including where relevant on conformity to commonly agreed standards, and information on related risks
- Recommendations on how to improve the smart readiness of the building or building unit taking into account, where relevant, the heritage value
- Additional information on the assumptions made in the calculation of scores such as weighting factors of impact criteria used for calculating smart readiness scores for key functionalities.

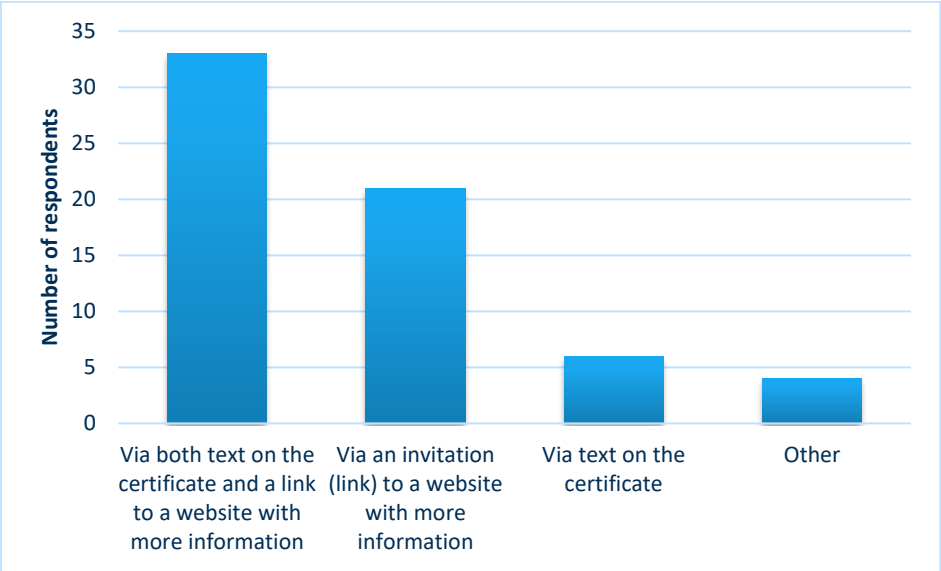
m) Indicate the importance of this optional information being included in the certificate:



From this it can be concluded that the respondents had a strong preference for the certificate to include recommendations on how SRI performance could be improved, but had more middling preferences for also showing information on interoperability & cybersecurity, connectivity and calculation assumptions (all were slightly favoured).

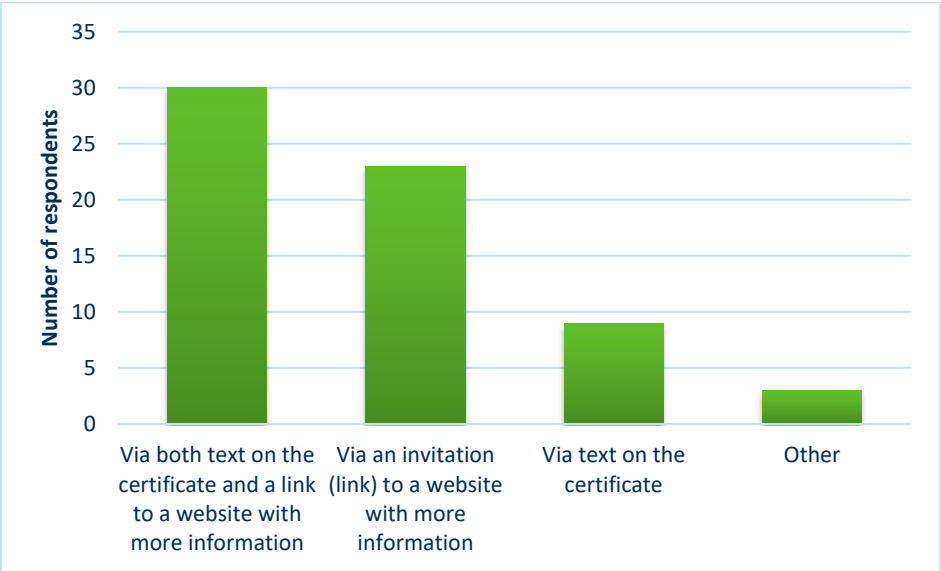
They were then asked:

n) How should the different aspects on the certificate be explained?



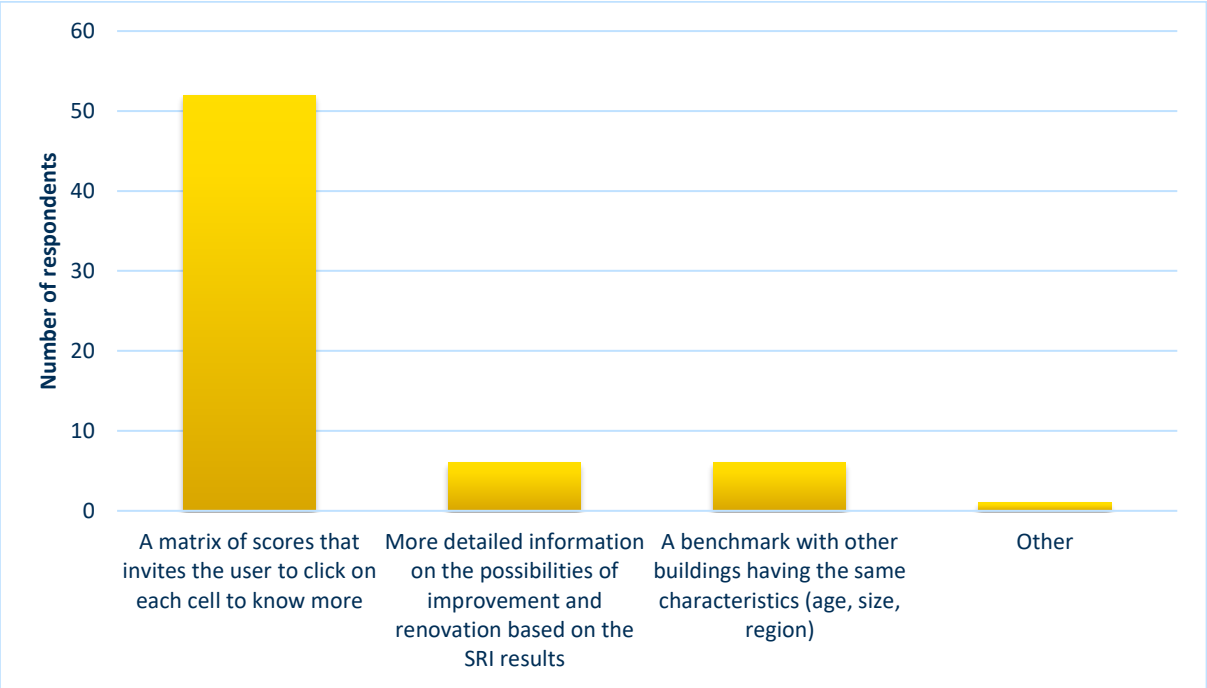
Thus, the respondents very strongly prefer that certificates carry some explanation on the certificate with a link to further information on a website or simply have all explanation on a website compared to simply using text on a certificate. Note, porting some information & explanation to a website could help reconcile an apparent conflict between the amount of information respondents have indicated they would like to see and their preferences for the length of the certificate.

o) How should the user be informed about options to improve their building's smart readiness scores?



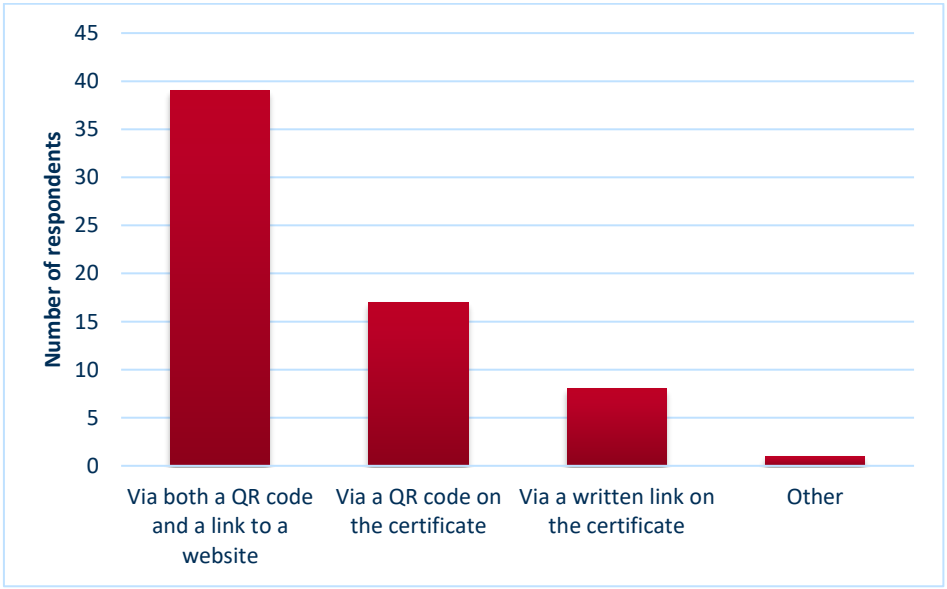
From this it can be concluded that the respondents very strongly prefer that at least some of the explanation on how to improve SRI performance is accessed with a link to information on a website.

p) If a website were used to communicate more information, it should include (select as many as apply):



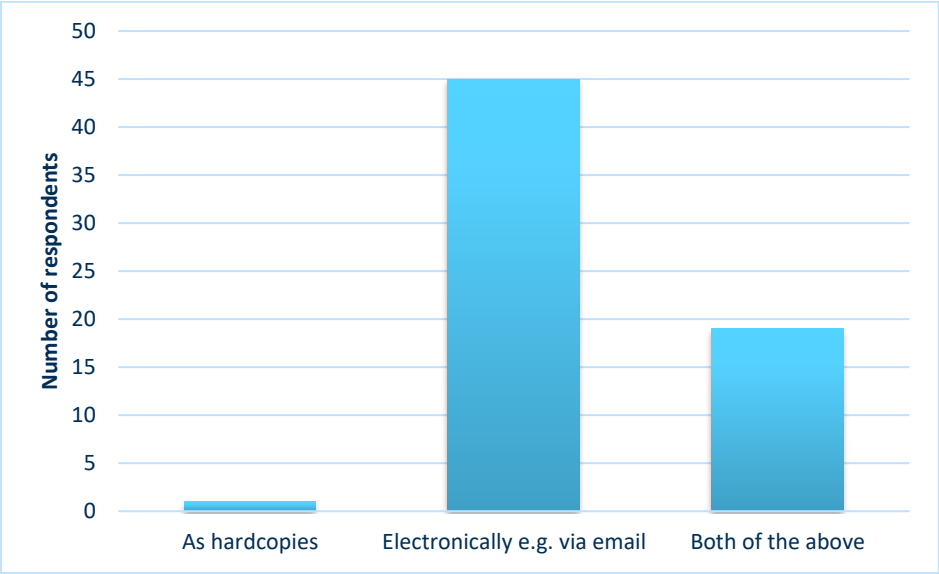
Thus, for the case where additional information is shown on a website respondents very strongly prefer that this includes an interactive matrix of domain and impact scores such that users can click on any intersection of these to gather specific information.

q) How should the user be invited to access the website?



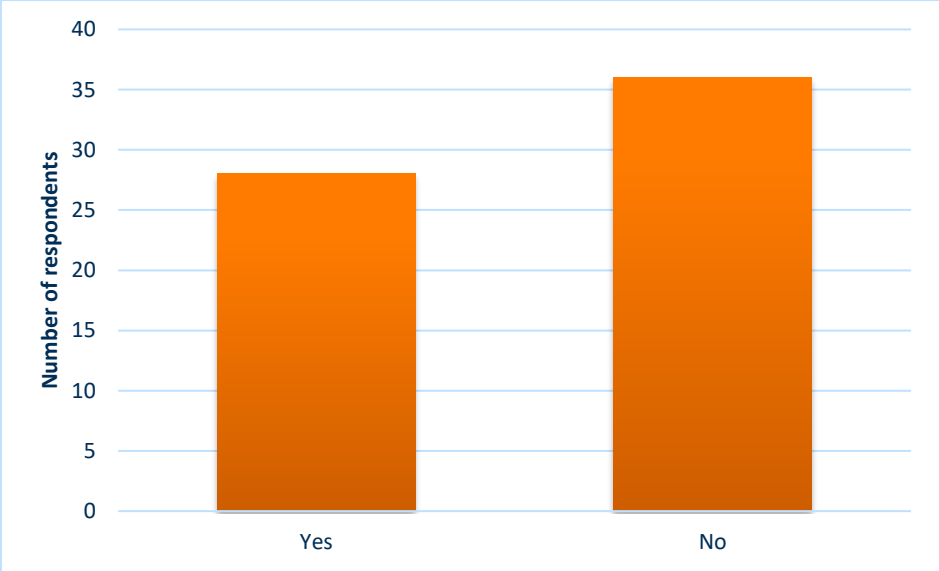
Thus, for the case where additional information is shown on a website respondents very strongly prefer that this can be accessed from the certificate using a QR code and a link to a website.

r) How should the certificates be delivered?



Thus, there is a strong preference for the certificates to be delivered electronically.

s) Should the SRI certificates be presented differently for residential and non-residential buildings?



From this it can be concluded that there is a slight preference for the same certificate design to be used for residential and non-residential buildings.

It should be stated that there is much in these responses which reinforces and nothing that contradicts the responses received to design questions put to consumers in the 2nd technical assistance study[2]. So these responses can provide a sound basis for the design of SRI certificates. In terms of what information is presented and the type of integrated design concepts used it tends to strongly favour the content and approaches used in the maximalist certificate Design 2 (which shows all the mandatory and optional scores) compared to the minimalist Design 1 (which only shows the mandatory scores).

4.3.1 Conclusions and guidance on certificate design

From the above it can be concluded that the preferred certificate design would include:

- the overall SRI score

- the SRI class (which is determined from the building's overall SRI score on a seven-grade scale
- the SRI scores, expressed as percentage values, for the three key functionalities
- the SRI scores, expressed as percentage values, for each of the seven impact criteria
- the matrix of SRI scores by technical domain and impact criteria

Practically, it seems best to provide the matrix, and the SRI scores, expressed as percentage values, for each of the 7 impact criteria in the same manner as shown in certificate Design Option 2.

While it is preferable if additional information can be presented on connectivity, interoperability, cybersecurity of systems and data protection it is not essential. Provision of this information could also be facilitated through webpages accessed by a QR code or link on the certificate. See also section 5.2.

It is preferable to provide information on what the SRI functionalities are and how the scores are determined; however, for pragmatic reasons (to avoid an excessive certificate length) this is likely to best be done through webpages accessed by a QR code or link on the certificate.

It is also preferable to provide recommendations on how to improve the smart readiness of the building or building unit; however, for pragmatic reasons (to avoid an excessive certificate length) this is likely to best be done through webpages accessed by a QR code or link on the certificate.

If information on SRI functionalities and recommendations on improvement are provided on a website it is likely to be most useful to display the matrix of domain and impacts and invite users to click on each aspect of interest to see nested information on how the scores are related to the functionalities, how the functionality can be improved and the benefits to be obtained from doing so.

In general, it is preferable that certificates carry some explanation on the certificate with a link to further information on a website or simply have all explanation on a website compared to simply using text on a certificate. It is also important that information be given on the SRI's scope, and especially what it doesn't address, to avoid misunderstanding and potential accusations of misrepresentation.

Preferably, the length of the physical certificate should be limited to two sides.

A priori, the same certificate design can be used for residential and non-residential buildings.

5 ASSESSMENT PROCESS AND DATA COLLECTION

As mentioned in section 3 the generic SRI assessment tool offers the option of two assessment methods: Method A (a simplified method) and Method B (a detailed method). The simplified method is intended to be used primarily in existing residential and small non-residential buildings of low complexity. While the detailed method is intended to be used primarily for non-residential buildings of a higher complexity and for new buildings. Both methods use the same assessment methodology and the generic service catalogue – the primary difference is that the detailed method includes a more comprehensive set of services in the catalogue. Key distinctions are summarised in the image below.

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

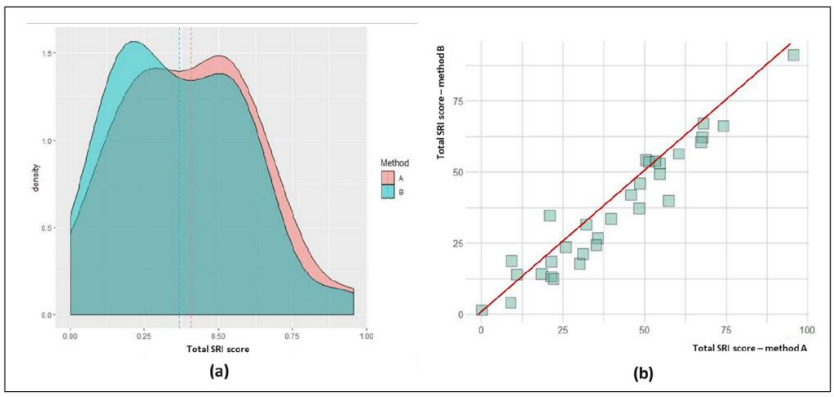
Method B (detailed)

- 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

While the detailed method includes more services and hence is more comprehensive than the simplified method the results of beta testing both methods with a set of 31 buildings found that the results were quite consistent for the overall SRI score (see the figure below).

- Within a previous study, 31 buildings were assessed with both the simplified method A and the more detailed method B
- It was concluded that the results for both methods A and B were generally well-aligned



Comparison of methods A and B, applied to the same buildings during the public beta test

The assessment process can be broken down into the following steps

- **Collection of information on buildings and systems** for the assessment of smart readiness, including but not limited to on-site inspections (section 5.1)
- **Means of collection of additional information** about building connectivity, system interoperability and cybersecurity in the scope of the assessment of smart readiness (section 5.2)

- **Means of dealing with changes in the calculation method** over time (e.g. through indicating a validity date or a version no.) (section 5.3).

Guidance on these aspects is now addressed in turn.

5.1 COLLECTION OF INFORMATION ON BUILDINGS AND SYSTEMS

As set out in the delegated regulation, the SRI requires application of an on-site assessment method in order to collect the information on a building and its technical domains needed to complete an SRI assessment. This information will be input by the assessor into the SRI calculation tool used in the Member State.

Visual inspection methods are applicable for collecting the required data and can be applied with checklists and suitable calculation tools (e.g. a calculation tool provided online or on a portable IT device). In principle, anything that can be inspected on-site can also be inspected off-site if the appropriate photographic/video evidence is provided, so in theory off-site inspection could also be used; however, on-site assessment carries less risk of something important not being seen providing the formal SRI assessor can access the appropriate parts of the site and also ensures that the evidence is indeed from the site being assessed. It also mitigates the risk of the supplied visual evidence not being comprehensive enough e.g. perhaps due to misunderstanding by the person on-site supplying the visual evidence.

When conducting an assessment an assessor will need to view all the pertinent technical domains and will often also need to inspect their technical documentation. For larger buildings it will frequently be more efficient to liaise with the facility manager who will be able to direct the inspector to the relevant places and supply relevant information to permit an effective assessment to take place. In order to support quality control of the assessments it will be important that assessors are required to either supply evidence to support their assessment (such as photographic evidence) or a Declaration of Honour, or both (see section 8.2 on Suggestions for setting-up an independent control system of the SRI scheme).

When assembling and assessing the evidence needed to conduct the SRI assessment having access to the following sources of information (where relevant) may also facilitate the assessment process:

- supporting calculation files, e.g. input/output data sheets from permitted energy performance assessment tools in a standardised format
- product data sheets
- checklists produced via other assessment processes (e.g. heating and cooling inspections) and any related Declarations of Honour
- supporting video and photographic evidence
- real-time performance data.

This evidence can be used to support and clarify the technical domain functionality assessments.

If online processes are set up through an assessment registration tool and database then it would facilitate any subsequent quality control verification actions and would be likely to considerably increase the quality of assessments achieved. This is because assessors would be more aware of the possibility that their assessments could be checked. With the implementation of an online registration system for all SRI assessments then many checks could be automated to systematically identify cases where:

- standardised data submissions and assessment files are incomplete
- reported values are inconsistent.

On the other hand, the establishment of automated data submission and processing systems would need to be done in way that adequately addresses data privacy and cybersecurity risks and hence would require careful implementation to respect the rights of building owners and contractors.

5.2 MEANS OF COLLECTION OF ADDITIONAL INFORMATION

As mentioned in section 4.2 the SRI delegated regulation[6,7] provides options to include additional information about connectivity, interoperability and cybersecurity on the SRI certificate.

Specifically, points (k) and (l) in Annex IX state:

> *The information contained in the smart readiness indicator and conveyed to the end user includes the following:*
>
> *(k) where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label,*
>
> *l) where possible, available information on interoperability, cybersecurity of systems and data protection, including where relevant on conformity to commonly agreed standards, and information on related risks*

The potential means of collecting information on the status of these for a building under SRI assessment is now discussed for each aspect in turn.

5.2.1 Building connectivity

The delegated regulation[6,7] stipulates that where possible, available information on connectivity, in particular on the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label[13] should be included in the SRI certificate.

As building connectivity is a necessary precursor to many smart ready technologies (SRTs) the "broadband ready" label[14] is also relevant to the SRI with regard to how ready the building is to apply such technologies and the services they offer. Furthermore, the implementation process has several parallels with the SRI's in that the scheme is initiated through an EU Directive but is voluntary for EU Member States and entails an inspection process to determine compliance with the nationally adopted specifications. In principal, where such schemes exist they could potentially be implemented in common with the SRI to share assessment costs and improve the net value proposition of both schemes, albeit that while the focus of both schemes overlap they are not the same.

Installing physical infrastructure that enables high-speed internet access is more cost-effective and less disturbing for residents if done at the time of construction or implementation of major renovation. If buildings are equipped with the necessary infrastructure, companies can install cables or other active equipment more quickly and at significantly lower costs, allowing them to offer their services faster and to more citizens. With this thought in mind, Articles 8 and 9 of the Directive on "Measures to reduce the cost of deploying high-speed electronic communications networks"[15] ensure high-speed-ready, accessible in-building physical infrastructure in all newly constructed and majorly renovated buildings.

To achieve this objective, the buildings for which permits are submitted after 31 December 2016 must be equipped with physical infrastructure, such as mini-ducts capable of hosting high-speed networks, and an easily accessible access point for the providers of public communications networks who wish to terminate

[13] The 2014 Broadband Cost Reduction Directive 2014/61/EU contains a provision that Member States may (voluntarily) provide a "broadband-ready label" for buildings which have been equipped with high-speed-ready in-building physical infrastructure where 'High-speed-ready in-building physical infrastructure' means in-building physical infrastructure intended to host elements or enable delivery of high-speed electronic communications networks.

[14] See also section 7 that concerns Integration With Other Assessment Schemes

[15] 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 Text with EEA relevance https://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex:32014L0061

their networks at the premises of the subscriber. Such buildings shall be eligible to receive the voluntary "broadband-ready" label in Member States where this is available.

RECOMMENDATION: Thus, it is recommended that at least all buildings that comply with this provision e.g. those who have received permits from 2017 onwards and any others that can demonstrate compliance should be recognised as being "broadband ready" on the SRI certificate.

5.2.2 System interoperability

The delegated regulation[6,7] for the SRI specifies that where possible, available information on interoperability including where relevant on conformity to commonly agreed standards can be presented on the certificate.

The degree of interoperability of technical systems can be a limiting factor affecting the smart services and impacts that can be delivered within a building. Interoperability of systems can avoid duplication of efforts (e.g. investment for occupancy detection systems and monitoring displays for lighting, for space heating and cooling and ventilation systems) and optimise the control and maintenance of technical domains (e.g. single interface for controlling heating and cooling facilitates the operation of the building and prevents spilling energy through uncoordinated simultaneous heating and cooling in building zones). Next, interoperability is essential for allowing technical domains to interact with the energy grids. Finally, interoperable systems are desirable in the light of future upgrades of the building as they can avoid proprietary lock-in and facilitate innovative solutions. Thus, for all these reasons interoperability is a highly relevant factor that affects a building's smart readiness.

The various levels of interoperability (technical, syntactical & semantic) complicate the definition and assessment of interoperability aspects.

In the generic SRI methodology, the smart readiness of a building or building unit is determined on the basis of the assessment of smart ready services (and their functionality level) present in a building. As such, it reflects the capabilities of the building or building unit to adapt its operation to the needs of the occupants and the grid, and to improve its energy efficiency and overall performance. Apart from these key capabilities, there are some cross-cutting issues related to the greater uptake of smart technologies, including interoperability of the technical buildings systems. The SRI could potentially play a role in informing the market actors on this important aspect and even assist in shaping the market.

Various ways to do so can be considered, e.g. blending the assessment in the core SRI calculation methodology, using the SRI as a means to disseminate additional information, or supplementing the SRI assessment with additional evaluations of these aspects besides the overall SRI score. In the 2nd technical assistance study[2], three potential approaches to consider interoperability within the SRI were presented, each with different implications towards SRI calculation methodology and assessment process:

- **Implicit approach**: Define services that require interoperability, without defining the required standards or protocols needed to enable such interoperability. For example, if a service for "avoiding simultaneous heating and cooling" is present, implicitly these systems will inherently have to be interoperable (either directly or through other gateways)
- **Explicit approach**: take into account the level of interoperability of services (based on the standards and protocols featured by a given TBS) in the calculation of the SRI. A higher SRI score could be granted if systems adhere to a list of specific standards and protocols
- **Informative approach**: Provide information of the level of interoperability of services (based on the standards and protocols featured by a given TBS), for instance, in the SRI and accompanying documents. A structured overview of such information provides a valuable source for building owners when planning to upgrade their building systems.

For pragmatic reasons a formal evaluation of interoperability in a manner which affects the SRI scoring process (i.e. the explicit approach) is not currently included as part of the generic SRI scoring system. The

reasons for this were explained in detail in the 2nd SRI technical assistance study[2] (page 88) and are summarised as follows:

- Whilst interoperability is acknowledged as a very important concern in relation to the SRI, there are significant limitations to the actionability of the explicit evaluation of interoperability
- It would require in-depth information on a very broad range of technology and implementation routes by numerous vendors - this information is usually not readily available to an assessor and would require additional investigations
- Especially in the case of legacy equipment it might be very hard or even impossible to retrieve sufficiently detailed information
- Such an assessment would need to be performed for many of the technical domains present in a building (heating, cooling, lighting, ventilation, building management systems (BMS)…), which would require a substantial amount of time and effort and thus have important repercussions on the cost of an SRI assessment.

Instead, the generic SRI methodology takes into account interoperability as follows:

- Implicitly, interoperability is evaluated as part of the generic SRI assessment: a few services explicitly require interoperability in order to achieve higher functionality levels (some services such as MC-S1 and MC-S3 are specifically introduced that support this goal)
- Additionally, information of interoperability aspects can be optionally added to the SRI certificate whenever it is available. This information does not affect the SRI score in itself.

Some schemes, such as that operated by the Smart Building Alliance[16] in France, do entail explicit assessments of building interoperability and when such information is available and produced by a credible and recognised source Member States could opt to include it within the information provided on the certificate. Member States who are considering this type of explicit interoperability assessment within the SRI are advised to appraise how this has been implemented in schemes such that operated by the Smart Building Alliance.

In principle, Member States may also wish to consider establishing their own system of inspecting the use of open protocols as a criterion in the assessment of interoperability aspects and reporting the findings on the certificate. This could be relevant in all three of the potential approaches that were previously delineated. However, when considering this Member States should be aware that there are some concerns towards establishing a practical assessment procedure:

- Using open standards can ease interoperability but this is not a synonym for interoperability because many open standards are not mutually interoperable. Nevertheless, their openness allows for gateways to be established which facilitate communication between two distinct protocols; a practice which is very common in the current market. From this perspective, the use of open protocols does not guarantee interoperability, but it would create a form of “readiness” to allow interoperability now or in the future
- For a practical assessment, the standards and protocols need to be well documented, e.g. in technical product sheets or labels. In the SRI calculation methodology, an evaluation would ideally be performed on the level of smart ready services or domains. In practice, most services and domains of the suggested SRI service catalogue require a smooth collaboration of a multitude of products (e.g. thermostats, pumps, valves, heat generators, etc.). The assessment of the use of open protocols therefore requires the inspection of a great variety of technical products. In principle, such

[16] https://www.smartbuildingsalliance.org/

assessment could be supported by the introduction of labels or codes on equipment, structured product databases or a means for TBS to self-report the standards and protocols which are supported.

- If this approach were to be pursued, a well-supported list of open standards will need to be defined. A first version of such a list was drafted under the 2nd SRI technical assistance study[2] and contains the following protocols: 1-wire, BACnet, DALI, DMX, EnOcean, KNX, Lonworks, Modbus, M-bus, TCP/IP, X10, ZigBee, Z-Wave. In addition, some stakeholder(s) suggested including SAREF and Spine (which are ontologies rather than protocols) and DECT/ULE. If the approach of using open standards and protocols is to be pursued, further actions would need to be taken to ensure a broad consensus on the list of standards and protocols to be included.

Interoperability is a fast-moving field, and many software and hardware solutions emerge which allow interoperability despite using different technologies and protocols, for example a DALI-to-KNX gateway to integrate lighting and KNX control. In conclusion, adoption of such an approach would require further efforts to generate a broad consensus on standards and protocols that would be accepted or the development of other definitions and a calculation method to explicitly rate interoperability scores.

RECOMMENDATION: For more information on interoperability and how to consider its inclusion within building certificates, such as the SRI, readers are recommended to read the SmartBuilt4EU Task Force publication on interoperability available at https://smartbuilt4eu.eu/publications/. Interoperability of BACS is discussed extensively in the Ecodesign Preparatory study for Building Automation and Controls[17].

5.2.3 Cybersecurity

The delegated regulation[6,7] for the SRI specifies that available information on cybersecurity including where relevant on conformity to commonly agreed standards, and information on related risks can be presented on the certificate.

Cybersecurity is highly relevant to the SRI in terms of data protection and ensuring no action associated with the SRI is responsible for compromising cybersecurity. As the SRI concerns smart technologies which are likely to be connected and hence potentially exploitable through cyberattacks the SRIs implementation needs to be mindful of these risks and take all reasonable steps to minimise them. The European Cybersecurity Certification framework[18] is thus potentially an initiative that could help to minimise such risks to the extent that it develops criteria that are applied to smart ready technologies (SRTs) and enables cybersecurity status to be communicated to market actors (see also the discussion in section 7).

At the current time this scheme is still quite new and cybersecurity certification requirements and regulations are under development according to a working plan. Development work is being conducted by ENISA[19].

Under this framework the Commission announced a set of measures to strengthen the cybersecurity of wireless devices and products in October 2020. The proposed legislation establishes obligations for manufacturers to increase the level of cybersecurity of products placed on the EU market. These obligations are for the benefit of consumers. It will also allow the Member States to take corrective measures in case

[17] https://energy.ec.europa.eu/studies/preparatory-studies/ecodesign-preparatory-study-building-automation-and-control-systems_en#documents

[18] The EU cybersecurity certification framework for ICT products enables the creation of tailored and risk-based EU certification schemes. https://digital-strategy.ec.europa.eu/en/policies/cybersecurity-certification-framework

[19] The European Union Agency for Cybersecurity (ENISA) https://www.enisa.europa.eu/

unsecure products are found on the market. The Commission's initiative aims to achieve the following objectives:

- Make networks more resilient: The equipment will have to incorporate features to avoid their misuse to harm communication networks.
- Improve the protection of personal data and consumers' privacy: The equipment will incorporate features to guarantee the protection of personal data and privacy.
- Reduce the risk of monetary fraud: The equipment will have to include features to minimise the risk of fraud when the equipment is used to make electronic payments.

The initiative notes that wireless equipment is the target of more than 80% of cybersecurity attacks, compared to wired devices. Accordingly, it covers certain categories of wireless devices that use radio technology. The decision on which devices are covered has been taken on a risk-based approach and according to the results of a cost-benefit analysis. In particular, the legislation is applicable to the following equipment (amongst others):

- Devices capable of communicating via the Internet: Examples of such equipment include electronic devices such as smartphones, tablets, electronic cameras; telecommunication equipment as well as equipment that constitutes the 'internet of things'. Due to insufficient security, such devices present a risk that third parties can improperly access and share personal data, including for fraud purposes, or that such equipment is misused to harm the network.

Many SRTs are capable of communicating with the internet and thus will become subject to the requirements of this initiative.

To implement this measure the Commission has adopted a delegated act under the Radio Equipment Directive (2014/53/EU)[20]. The co-legislators empowered it to determine certain essential requirements with respect to specific classes and categories of radio equipment.

The delegated act imposes essential requirements, formulated in general terms as objectives to be achieved, that are deemed necessary for ensuring an adequate level of cybersecurity, personal data protection and privacy. The manufacturers will have the possibility to choose the specific technical solutions for the implementation of these objectives.

The Commission are launching a standardisation request to the European Standardisation Organisations in order to develop harmonised standards in support of this piece of legislation. The standards will be developed with the participation of industry and will be assessed by the Commission against the essential requirements laid down by the EU legal framework. Once it has been established that the specific technical solutions described in these standards comply with the applicable legal requirements, these standards can provide a presumption of conformity with the delegated act. Concretely, this would imply that to benefit from a presumption that their product complies with the applicable legal requirements, manufacturers have to adopt a given technical solution described in a harmonised standard.

Under the terms of the delegated act all wireless products with relevance to SRTs that are placed on the market will be required to be cybersecure from the summer of 2023 onward. Member States will thus have the option of adapting SRI assessments to determine whether wireless devices providing smart capabilities in the building stock being assessed are in compliance with this regulation and reporting this in the SRI certificate, or potentially simply using the certificate to inform users of the importance of cybersecurity and of initiatives to enhance such security.

[20] https://ec.europa.eu/growth/system/files/2021-10/C_2021_7672_F1_COMMISSION_DELEGATED_REGULATION_EN_V10_P1_1428769.PDF

In addition, or alternatively, Member State specific cybersecurity initiatives may already be operational and can provide a basis for information to be supplied on the certificate.

5.3 MEANS OF DEALING WITH CHANGES IN THE CALCULATION METHOD OVER TIME

For reasons that have been explained in section 3.5 it is expected that the SRI calculation methodology will evolve over time. This will allow higher future functionalities to be accounted for, the potential addition of new services and improvements in the assessment method to be included in future versions of the SRI.

In partial anticipation of this, the SRI delegated regulation[6,7] specifications for the SRI certificate stipulate that it is mandatory for the certificate to include:

(a) unique ID of the certificate

(b) date of issue and date of expiry of the certificate

(m) an informational text clarifying that the certificate reflects the smart readiness at the date of issuance and that any significant modifications to the building and its systems would affect smart readiness and would therefore require an update of the information given on the certificate.

Each of these aspects will help to ensure that it is clear that the certificate information and related scores are unique to when the assessment was conducted and the certificate issued and are only valid within a certain period and until such point as amendments are made to the building and its technical systems. The requirement to include an expiry date for the certificate should help to mitigate problems that could occur in the comparability of scores from one certificate to another due to periodic upgrades in the SRI calculation methodology.

However, these aspects alone may not be sufficient to avoid confusion in the market as a change in the methodology could occur before the expiry of a certificate issued under the previous methodology and thus the same building could receive different SRI scores (under the old and new methodologies) without having changed any of the functional characteristics of its technical systems. This problem has occurred in numerous asset or product performance rating schemes (e.g. EPCs, building sustainability certification schemes, energy labels, Eco labels and Energy Star) and the standard means of addressing it is to indicate the version number of the assessment methodology on the certificate. As the SRI assessment methodology is new and currently there is no history of SRI methodological changes the first version could be denoted as SRI methodology version 1 circa 2021. This information could be optionally conveyed in the certificates. Once future changes occur[21] they could be denoted as version X, circa 2XXX etc. and this makes it clear to users that the scores on the certificate can only be directly compared to assessment scores made with the same assessment methodology.

RECOMMENDATION: Considering these factors it is recommended that in addition to the certificate including a unique ID and a date of issue and date of expiry of the certificate (as specified under Annex IX of the delegated regulation[6,7]), that Member States also consider adding a methodology version number.

[21] Working Group 2 of the SRI Platform is charged with considering any need to update the SRI methodology.

6 ASSESSORS

This section on assessors provides guidance on:

- **Qualification and training of experts**, with potential suggestions to include SRI training in relevant national or EU-wide qualification frameworks
- Principles related to the financing of **assessment studies**.

6.1 QUALIFICATION AND TRAINING OF EXPERTS

The SRI delegated regulation[6] requires SRI assessors to be certified whenever SRI certificates are issued and this necessitates the training and formal qualification of assessors.

Specifically, Article 8 on *Smart readiness indicator experts* stipulates:

> *1. Member States that decide to implement the smart readiness indicator shall ensure that the assessment of the smart readiness of buildings or building units with a view to issuing a smart readiness certificate is carried out by experts that are qualified or accredited. The experts may operate as self-employed or be employed by public bodies or private enterprises.*
>
> *2. Member States that decide to implement the smart readiness indicator scheme shall lay down requirements on the qualification or accreditation of smart readiness indicator experts and ensure that those requirements include competence criteria, including in the ICT field.*

Member States already have considerable experience in training and certifying qualified professional assessors to do building energy performance assessments. This experience includes the training and certification of:

- energy performance certificate assessors
- inspectors of heating and air-conditioning systems (under Articles 14 and 15 of the EPBD)
- building energy auditors (specifically reporting on heating and air-conditioning systems in buildings under Article 8 of the Energy Efficiency Directive).

In addition, there is also experience of training, qualification and certification of professionals to conduct assessment of voluntary building energy and environmental performance assessments via such schemes as:

- BREEAM[22]
- HQE[23]
- DGNB[24]
- Level(s)[25]
- LEED[26]

[22] The Building Research Establishment Environmental Assessment Method (BREEAM), www.breeam.com

[23] Haut Qualité Environnementale http://www.hqegbc.org/batiments/certifications/

[24] The rating system of the German Society for Sustainable Building (Deutsche Gesellschaft für Nachhaltiges Bauen; DGNB) https://www.dgnb.de/de/index.php

[25] Level(s) is a framework produced by the European Commission, using voluntary reporting to improve building sustainability. https://ec.europa.eu/environment/levels_en

- Building Information Modelling (BIM)

Furthermore, there is also relevant experience via the following schemes (amongst others):

- The Smart Building Alliance (mostly based in France)[27]
- The "broadband ready" label[28].

The experience of training, qualifying and certifying professional assessors under the EPBD scheme has been progressive as the scope of the assessments and the related skillsets have expanded from the first incarnation of the EPBD through to the latest 2018 version. New items to be assessed have been progressively added and this has necessitated progressive extensions to Member State training and certification schemes.

The SRI methodology specified in the delegated regulation has been designed to be conducted via onsite assessment in the same way as would be needed for any of the above-mentioned schemes, but it largely follows a checklist process which in some ways makes it simpler than some of the aspects required by many of these schemes. Nonetheless, the assessors need to be competent to make the assessment and they need to have a good understanding of the technical systems in buildings.

Member States have freedom as to how they will go about training, qualifying and certifying SRI assessors, but a priori it can be anticipated that many will choose to invite established building performance assessors to undergo SRI assessment training and certification. Whenever, assessors who are qualified to conduct an existing building performance assessment scheme are to be invited to undergo qualification to become an SRI assessor then the modularity of additional skills they need will have to be determined and training adapted to provide this. If the assessors are not already qualified to do any existing building performance assessment then they will need comprehensive training to ensure they have the full set of skills required. A priori, it is expected that Member States planning to implement the SRI will simply chose to adapt their existing training and qualification/certification systems to include SRI assessment. These existing schemes will already have their procedures in place and these will have been adapted to suit the national/local contexts which they operate within.

RECOMMENDATION: To develop such training it is recommended that:

- a process be undertaken to map the assessors existing skillsets to the required SRI assessment skillsets, then
- tailored SRI training and qualification/certification modules be developed that build upon the existing process.

To implement training for wide implementation it is recommended that a training-the-trainers approach be used such that first a cadre of qualified (i.e. accredited) trainers are established and once this is in place these then train and certify others to become qualified assessors.

In order to support the assessment training process an SRI assessment package: calculation sheet and practical guide (available on request by using this form: https://ec.europa.eu/eusurvey/runner/SRI-

[26] Leadership in Energy and Environmental Design of the Green Building Council, https://www.usgbc.org/leed

[27] http://www.smartbuildingsalliance.org

[28] Directive 2014/61/EU of the European Parliament and the Council https://ec.europa.eu/digitalsingle-market/en/news/directive-201461eu-european-parliament-and-council

assessment-package) has been prepared. This is complemented by related training webinars which are available at the Commission's SRI web pages[29] and which cover the following topics:

- Introduction to the SRI framework
- Overview of the SRI scoring methodology
- Must-know before undertaking an SRI assessment
- How to assess the smart readiness of a building
- Tips & tricks, frequently asked questions
- References.

Note, as Member States may decide whether certificates will be issued during the national testing phase then they have freedom to time the training and certification process such that a cadre of qualified and certified assessors are available in advance of official SRI certificates being issued during the testing phase.

6.2 PRINCIPLES RELATED TO THE FINANCING OF ASSESSMENT STUDIES

When implementing the SRI Member States will need to consider which business model or models should be permitted, promoted or required to fund the conduct of SRI assessments and the issuance of the SRI certificates. There are several factors to consider in this, such as:

- the value of the SRI certificate and the nature of the beneficiary of the assessment
- economies of scale that can bring costs down and enable greater levels of adoption
- broader societal benefits from elevated levels of knowledge and literacy of building smartness.

If the SRI is deemed to be sufficiently valuable and demanded by individual beneficiaries (e.g. building owners) then a business model could exist to issue the certificates on an owner pays basis, much as is done for private green building certificate schemes; however, the adoption levels of such schemes are much less than for mandated certification schemes such as EPCs and (partially) as a result the costs per certification are also higher. To both broaden uptake and bring costs down and then economies of scale are needed and this could be achieved by linking the scheme to mandatory certifications (EPCs), to mandatory assessments (e.g. HVAC inspections when they occur), or by large scale subsidies (e.g. funded through utility energy efficiency schemes in line with article 7 of the Energy Efficiency Directive). The 2nd SRI technical assistance study[2] assessed the likely scale and impact of SRI certification as a function of different deployment models and concluded that linkage to the EPC would have the lowest cost, achieve the highest level of adoption and bring the biggest net benefits so this option should be considered as a leading contender by Member States. However, if a decision is made to move forward with EPC linkage then implementation could be phased in over time with the scheme initially being piloted on a voluntary basis, and then linked to the EPC successively by building types. Note, a full or partial linkage of the SRI with the issuance of EPCs does not preclude also linking it to other building assessment initiatives as is discussed in section 7 below.

[29] https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator/sri-implementation-tools_en

7 INTEGRATION WITH OTHER ASSESSMENT SCHEMES

This section provides EU Guidance in relation to the potential implementation of the SRI in conjunction with other assessment schemes. Specifically, it addresses:

- Possible **coupling of the SRI scheme to existing schemes**
- Interoperability to allow data exchanges from and to the SRI scheme (e.g. introduction of energy balance data from energy performance certificates to define domain weighting factors in the SRI; e.g. usage data from SRI assessment to inform an energy performance certificate on energy savings attributed to a smart thermostat in a particular building, etc.)
- Potential information provision on the **SRI-related capabilities of technical building systems** (e.g. through labelling, online datasets with up-to-date specifications, use of SRI references in marketing, etc.).

7.1 POTENTIAL COUPLING OF THE SRI SCHEME TO EXISTING SCHEMES

As mentioned in section 6.1 there are a considerable number of existing building assessment schemes that the SRI could be connected with and implemented with conjointly. In principle, making such connections will enable the exploitation of synergies with regards to:

- Recruitment of building users wishing their buildings to be assessed
- Access to buildings and sharing of assessment costs
- Assessor training, qualification and certification
- Leveraged value for users
- Leveraged scheme recognition and brand building
- Leveraged communication and awareness raising.

The most important schemes to consider establishing such connections to are those which are already implemented by Member States themselves and particularly the schemes for the issuance of energy performance certificates and the periodic inspection of heating and cooling systems. In both cases, Member States may wish to offer an SRI assessment as a voluntary option or (once a test phase has been successfully demonstrated) to consider making the SRI mandatory within their jurisdictions.

If the SRI were to be coupled with an existing mandatory scheme then the option (or requirement) to have an SRI assessment would immediately be offered to a large number of building owners and hence the exposure to the SRI would be greatly increased compared to a case where the SRI is purely a standalone optional tool. The expected impact of the SRI at the EU-level was assessed in the 2nd technical assistance study[2] for a variety of implementation cases and the option where it was integrated into the implementation of EPCs was found to have the largest impact. Thus, it is recommended that this option be examined in the SRI test phase and if confirmed to be viable to be considered as the basis for national adoption.

Currently, Member States might organise on-site inspections for any of the following reasons:

1. to issue an EPC
2. to conduct a heating system inspection in accordance with Article 14 of the EPBD (required for systems >70kW)
3. to conduct an air conditioning system inspection in accordance with Article 15 of the EPBD (required for systems >70kW)
4. to conduct a combined HVAC system inspection (potentially including ventilation) in accordance with Articles 14 and 15 of the EPBD

5. as-built checks for permits to use
6. for safety compliance checks of a heating system
7. for building and ventilation system air leakage tests
8. for F-gas compliance checks for a heat pump or AC system
9. for Ecodesign/ELR market surveillance checks for the energy labels applied for space heating systems and domestic hot water systems.

Only the first seven of these are likely to be done systematically and even here the practice (including the building/technical domain types in scope, the frequency of inspections and the nature of the party checking conformity) varies by Member State or even within them. Nonetheless, all Member State issue EPCs, all have heating and AC system inspections (at least for systems of >70kW), all are thought to require some kind of heating system safety conformity check and many are believed to require air leakage testing. In principle, any of these inspection processes could be adapted to include/encompass SRI assessments.

Evidently, several of these other sources of on-site inspection only entail inspection of certain technical building systems (TBS) (space-heating, space-cooling and combined HVAC inspections; heating systems safety checks; air-leakage tests; F-gas checks), while those for built permit checks and EPCs are tied to the permitting and EPC issuance processes respectively. Both factors (technical scope and timing) would affect their potential suitability for linkage with SRI assessment.

In addition, the skills required by the assessor also need to be taken into account. A priori, it is assumed that if an assessor is conducting energy performance checks for a TBS, such as is the case for heating and space cooling inspections, then they would already have many of the requisite skills and experience necessary to conduct SRI assessments, and would only require a relatively modest amount of additional training. As AC and ventilation systems are often related then a modest additional training might be needed to broaden the scope of AC system inspectors to cover ventilation TBS requirements. With more training it is not unreasonable to imagine an AC system inspector could be qualified to do heating system conformity checks too. In theory, the same process could apply for heating system inspectors although the additional training might need to be more extensive and protracted. Some countries, for example Germany, already employ the inspectors who are responsible for conducting heating system safety checks to conduct heating energy performance checks. It is equally conceivable that an inspector used for market surveillance of packaged energy labels for space and water heating systems could relatively easily acquire the skillsets necessary to conduct inspections for such systems. In the case of F-gas and space cooling system inspections it is already frequent for these to be combined (i.e. such that the F-gas inspection occurs at the same time as the AC inspection) and hence there is no extra opportunity to combine with TBS inspections than for the AC inspection case already discussed) it would probably require a more extensive upskilling process to use F-gas inspectors (who are only doing that currently) for AC inspections.

In the case of EPC inspectors the applicability of their skill sets may depend on the type of building (e.g. residential or non-residential or both) they are qualified to verify EPCs for and the rigour of the EPC assessments currently required in the Member State in question. In principle, though EPC inspectors could be readily trained to also conduct TBS conformity verification checks and the software tools the inspectors (may) already apply to determine EPC compliance used to check system level performance conformity assessments for TBS. Obviously, the issue of the frequency/timing of EPC issuance compared to the moment a TBS conformity assessment declaration is made would need to be factored into the viability assessment as if an EPC is not issued until many years after a TBS is installed it can complicate the process of seeking remedial action from a contractor responsible for a non-compliant installation; however, viewed en masse linkage of TBS conformity verification with EPC inspections could offer an attractive synergy. The same could be true of linkage with as-built permitting inspections but these are only generally applicable to new build or major renovations building stages and hence would only capture a sub-set of the TBS installations subject to Article 8(1) requirements.

7.2 INTEROPERABILITY

The issue of interoperability was discussed in section 5.2.2 wherein it was noted that some existing building performance certification schemes already entail formal explicit assessments of building interoperability and when such information is available and produced by a credible and recognised source Member States could opt to include it within the information provided on the certificate.

7.3 POTENTIAL INFORMATION PROVISION ON THE SRI-RELATED CAPABILITIES OF TECHNICAL BUILDING SYSTEMS

In the medium to longer term SRI assessment will be facilitated if the information on the SRI functionality of technical domains is declared when technical building systems (and technical domains in general) are installed. In principle it would also be facilitated if such declarations were made when a component of an technical domain is replaced and/or when a technical building system is inspected. Member States should therefore consider whether they will aim to encourage such practice either through setting requirements on the specifiers/installers of technical building systems and/or through those responsible for their inspection. In particular, Member States could require technical building system SRI functionalities to be assessed and declared when a system is newly installed or replaced. This would not only facilitate SRI assessment but would help promote awareness of technical system smartness functionality by placing an obligation on specifiers and installers to determine and declare smartness functionality to the procurers. This in turn would help to integrate the SRI functionality into the promotional material provided by the suppliers and create increased awareness of the value proposition within the market.

In principle, information about the extent to which specific technical equipment provide any given SRI functionality level could also be provided by the equipment suppliers. Providing there is a high degree of commonality in the functionality levels applied across the EU it will be relatively straightforward for equipment suppliers to provide the information in a common manner across the Single Market as a whole. This in turn, will facilitate the determination of the SRI functionality level provided to the equipment procurer by the specifier/installer.

There are likely to be many practical issues to address before any requirement to provide such information could be made compulsory, thus, a staged approach is likely to work best. Initially, training could be provided to a cadre of installers, via (for example) professional associations, to familiarise them with the SRI functionality levels applicable to their technical domain and to clarify how such functionality is to be determined for conformity assessment declarations. This could then be trialled in a voluntary pilot scheme, which might provide incentives for early adopters. If found to be successful it could be progressively scaled-up by providing incentives over a larger part of the market. Ultimately, once a sufficiently large part of the installer base has acquired the requisite skills the provision of the SRI functionality information could be made mandatory, perhaps phased in progressively for different segments of the market.

There will be much to be learned from sharing experience in this type of action with other Member States and even in coordinated actions to help build critical mass in the market. This is the type of measure that could be discussed by Member States in a collaborative manner within Working Group 1 of the SRI Platform.

8 MEMBER STATE IMPLEMENTATION, CONTROL AND SHARING

This section considers EU Guidance in relation to the implementation of the SRI, its control and the sharing of information. Specifically, it addresses:

- **Best practices to involve** the relevant stakeholders (e.g. mapping of markets and companies)
- Suggestions for setting-up an **independent control system** of the SRI scheme
- **Framing and adequate implementation principle of self-assessment** of smart readiness by a non-expert audience
- Suggestions concerning a **harmonised principle (and system) to share data** and results of Member State/pilot phase findings could be delivered.

Note, that according to the Commission Implementing Regulation (EU) 2020/2156[30], all arrangements of the national test phases shall be defined by Member States, including the decision on whether certificates are issued during the test phase.

8.1 BEST PRACTICES TO INVOLVE RELEVANT STAKEHOLDERS

A large variety of stakeholders are concerned by the SRI, a non-exhaustive list are:

- Suppliers, specifiers, integrators and installers of technical building systems
- Estate agents and property sector professionals
- Architects and building designers
- Building software suppliers and professionals
- Facility managers
- Building owners and leasers
- Building portfolio managers
- Building renters and other users
- Energy utilities and aggregators
- EV suppliers and service providers
- Building performance assessors, certifiers and related training and accreditation bodies
- The managers/promoters of complementary building performance assessment schemes
- Municipalities and local authorities
- Professional bodies who represent the above stakeholders
- Standards bodies
- Environmental groups
- Academia

[30] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2020.431.01.0025.01.ENG&toc=OJ:L:2020:431:TOC

- Other relevant civil society groups and NGOs.

Each Member State entering an SRI test phase will need to map and engage with these stakeholders in order to raise their awareness of and interest in the SRI, to ensure their sector is prepared for the SRI and is primed to contribute to its success, and to receive their feedback on its implementation.

Establishing effective lines of communication with such stakeholders will be essential for the success of this communication and engagement. Much as is being done at EU level this could include establishing an SRI website, support materials and communication outreach actions (such as newsletters) at the national level. It would also likely entail organisation of related meetings and webinars.

Ultimately, Member States may wish to consider establishing their own national equivalent of the SRI Platform to allows stakeholders to engage with its implementation and share suggestions and experience.

8.2 SETTING-UP AN INDEPENDENT CONTROL SYSTEM

Article 9 of the SRI delegated regulation[6] on *Control system of the smart readiness indicator scheme* states:

> *1. Member States that decide to implement the smart readiness indicator scheme shall establish an independent control system for smart readiness indicator certificates. Where relevant, those Member States may rely on the independent control systems that are already in place, such as those for energy performance certification schemes.*
>
> *2. The independent control system shall ensure the validity of the smart readiness indicator certificates issued on the Member State's territory.*

Thus, if a Member State formally implements the SRI following the test phase then they will need to establish an independent control system for the SRI certificates. This is because it is important for the credibility and market acceptance of the SRI for an independent control system to be established to verify that the assessments conducted and certificates issued are of a good quality and are applied consistently across market operators. This can be asserted confidently following the experience for EPCs and the inspection of heating and cooling systems.

See the discussion in section 5.1 on potential quality control mechanisms for SRI assessments.

8.3 FRAMING AND ADEQUATE IMPLEMENTATION PRINCIPLE OF SELF-ASSESSMENT

Although Article 8 of the SRI delegated regulation[6] stipulates that SRI certificates can only be issued by qualified professional assessors there are likely to be many instances where building owners or users would like to conduct a self-assessment that does not result in the issuance of a certificate. This situation could arise under the following circumstances (amongst others):

- where a building user and/or owner would like to assess their building's smartness without engaging a qualified assessor and having a certificate issued
- where a building user and/or owner would like to pre-assess their building's smartness, potentially with the view to make improvements, in advance of engaging a qualified assessor and having a certificate issued
- where a building user and/or owner would like to understand their building's smartness but no formal certification system is offered within the jurisdiction where their building resides.

RECOMMENDATION: To facilitate such self-assessment it is recommended that Member States consider establishing an online self-assessment hub, e.g. a website with supporting assessment tools and guidance. They may also wish to direct users to any such facility that may be created and managed at the EU level in the future. Such a hub could also provide information on the SRI scope, the SRT functionality levels and scoring, and recommendations on how to improve SRI functionality and elevate SRI scores.

8.4 HARMONISED PRINCIPLE (AND SYSTEM) TO SHARE DATA

In generating SRI assessments and issuing SRI certificates a lot of data will be generated and collected. There are three primary needs with regard to this data:

- to keep track of the progress and impact of the SRI scheme
- to enable quality assurance to ensure the assessments are being done correctly and consistently
- to provide input to other building performance assessment schemes.

To conduct this it will be important that Member States establish appropriate principles and systems to collate and share data.

8.4.1 Tracking the progress and impact of the SRI scheme

In this case data is needed on the number of SRI assessments conducted differentiated by building type which will allow the uptake of SRI assessments to be monitored and allow for adjusted or additional efforts to promote uptake as deemed appropriate. In addition to tracking the number of SRI certificates issued it will also be pertinent to track the overall SRI scores, the SRI classes, the SRI scores per the three key smart readiness functionalities, and the SRI scores by technical domain and impact criteria. This information will enable targeted actions that, for example, could target the smartness of heating and hot water systems or of specific aspects of most interest to public policy.

Ordinarily, the compilation of such data will be achieved by the assessor reporting the data into a central database either on a nominated or anonymous manner depending on data sharing permissions. Member States planning to implement the SRI will therefore need to make suitable arrangements for such data compilation that respect the users data privacy and are cybersecure. In addition, Member States will need to determine an impact reporting protocol that sets out what data is reported in what way and over what frequency of reporting period.

RECOMMENDATION: A priori, it is recommended that Member States aim to share anonymised data on the following data fields:

- the number of SRI assessments conducted per building type
- the overall SRI scores
- the SRI classes
- the SRI scores per the three key smart readiness functionalities
- (optional) the SRI scores by technical domain and impact criteria
- (optional) the SRI scores by impact criteria.

It is recommended that the above scores be reported as both average values and as the distributions.

Such data can then be shared within the jurisdiction, but also with the European Commission and with other Member States via the SRI Platform Working Group 1.

It should also be noted that the Annex[31] on *Monitoring of the implementation of the smart readiness indicator scheme* of the SRI Implementing Regulation[32] stipulates the following:

[31] https://energy.ec.europa.eu/document/download/b385ee9d-f4d7-4351-9158-76e4b9591144_en?filename=smart_readiness_buildings_implementing_act_annex_c2020_6929.pdf

[32] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2020.431.01.0025.01.ENG&toc=OJ:L:2020:431:TOC

1. For each certificate issued, data on the following categories, where available, are reported by experts to national or, where relevant, regional authorities:

(a) the type of buildings or building unit;

(b) the total useful floor area of the building or building unit;

(c) the smart readiness class;

(d) the overall smart readiness score;

(e) the smart readiness scores with regard to the three key smart readiness functionalities highlighted in Annex IA to Directive 2010/31/EU and in Delegated Regulation (EU) 2020/2155;

(f) the smart readiness scores with regard to the smart readiness indicator impact criteria as set out in Annex II to Delegated Regulation (EU) 2020/2155.

2. Member States may choose the most effective approach to allow for collecting those data. They may rely on their energy performance certificate database, where available.

3. Member States report annually to the Commission on the data collected in accordance with the requirements set out in point 1. The annual report to the Commission includes, where available, at least the following:

(a) the total number of smart readiness indicator certificates issued, the overall distribution of smart readiness classes, in accordance with Annex VIII to Delegated Regulation (EU) 2020/2155, and statistics on the energy performance of buildings and building units for which smart readiness indicator certificates were issued;

(b) statistics on the buildings for which smart readiness indicator certificates were issued in the reporting year, including the share of certificates for:

(1) residential and non-residential buildings;

(2) single family dwellings;

(3) multifamily apartment buildings;

(4) non-residential buildings with a total useful floor area equal to or less than 1 000 m2;

(5) non-residential buildings with a total useful floor area of more than 1 000 m2.

(c) The distribution of smart readiness classes, according to Annex VIII to Delegated Regulation (EU) 2020/2155 for each of the following categories of buildings:

(1) single family dwellings;

(2) multifamily apartment buildings;

(3) non-residential buildings with a total useful floor area equal to or less than 1 000 m2;

(4) non-residential buildings with a total useful floor area of more than 1 000 m2.

4. Where allowed by available data, Member States may give more detailed statistics, differentiating between building types such as educational buildings, healthcare buildings, or heritage buildings.

8.4.2 Data sharing to support quality assurance

As with any building performance certification schemes there is a need to provide quality assurance to ensure the assessments are being done correctly and consistently. One means of facilitating this is to compile a record of the SRI assessment data, including of the functionality scores attributed to each technical domain and of any supporting evidence used to determine the scores attributed and then enabling this to be subject to 3rd party validation. In all cases there is a need to define, record and communicate the evidential data needed to demonstrate that the functionality scores determined in the SRI assessment are valid and to establish protocols for sharing such data.

There are a spectrum of approaches which are possible in regard to the provision of evidence that range from a minimalist to a maximalist approach, as follows:

- A minimalist approach would be to require no evidence of the SRI functionality score assessment to be provided by the certifier but to ensure quality by the conduct of random control inspections
- A maximalist approach would be to require SRI certifiers to provide evidence supporting each functionality assessment referenced against the various criteria – this could be facilitated by the establishment of a web portal to allow the assessor to upload this data into a central database.

The current SRI test phase being conducted in France by CEREMA[33]/DHUP[34] has adopted the first approach while typical Green Building Standards assessment systems, such as BREEAM and similar schemes, tend to use the latter. The trade-off between these approaches is one of greater rigour and higher quality assurance (for the latter) compared to lower assessment burden and hence lower cost for the former. There are legitimate arguments in favour of either and where the best balance resides is likely to be contextual and influenced by other decisions, such as the relationship between the way the scheme is implemented within a given jurisdiction and other existing building performance assessment schemes.

Hybrid approaches are also possible e.g. where assessments for more complex buildings, or for buildings where owners are prepared to pay a premium, are conducted using a more maximalist quality control model but those for simpler buildings, or for those not prepared to pay for a quality assurance premium, could use the more minimalist approach. For the more maximalist approach the level of substantiating evidence required could also be more or less exacting and even be tailored to be more focused on the technical domains with the highest impact and less so for those with lower impact.

As mentioned above the decision is also likely to be influenced by the choice of the assessment business model adopted. For example, if SRI certification is formally linked to the issuance of an EPC then it is likely to be pragmatic to adapt the EPC quality assurance system, including its data sharing provisions, to include the SRI assessment. The same might be true for linkages made with other building performance assessment schemes such as digital building logbooks. For example, in relation to building digital logbooks, the 2020 EC report[35] includes a table that provides an overview of all the data fields a logbook should contain:

- Descriptions of the “systems” could be cross-referenced in the SRI evaluation to justify the functionality level
- The use of ‘linked documents’ for some fields (e.g. in relation with the building material inventory)
- In addition this has already anticipated the use of SRI results, see the table below:

[33] https://www.cerema.fr/en

[34] https://immobilier-etat.gouv.fr/pages/direction-lhabitat-lurbanisme-paysages-dhup

[35] Source: *Definition of the digital building logbook: Report 1 of the study on the development of a European Union framework for buildings' digital logbook*, https://op.europa.eu/en/publication-detail/-/publication/cacf9ee6-06ba-11eb-a511-01aa75ed71a1/language-en (excerpt from Table 3, p18-21)

Data category	Data field	Type of data	Where is the data stored today	Building typology (single family=S, multi-family = M, Office = O etc.	New (N) or existing (E) buildings	Static (S) or dynamc (D)	Ease of collection (1 = easy, 3 = difficult)
Smart readiness	SRI result	Rating	Audit	All	Both	S	2
	Charging infrastructure for E-mobility	Yes/No	Building owner	All	Both	S	1
	Smart district potential	Descriptive	Public registry	All	Both	S	2
	Demand response potential	Descriptive	Audit	All	Both	S	3

8.4.3 Data sharing with other building performance assessment schemes

As mentioned in section 8.4.2 there are likely to be synergies between SRI assessment and certification and other building performance assessment schemes. Member States authorities will need to identify such synergies and establish the rules for sharing data when it is complementary and beneficial to do so.

These data exchange opportunities are likely to be bi-directional, for example, an assessment of SRI functionality scores could be informed by input evidence obtained from digital building logbooks or conversely could provide information that is also relevant to a digital building logbook. In principle a functionality level score should refer to a technical description of a system, or several systems, or even to entries in a Digital Logbook.

Thus, Member States will need to determine what should (or should not) be shared and with whom and when data exchange is permitted establish the rules and formats for doing so.