Agenda

Introduction to the Smart Readiness Indicator

LIFE-2021-CET-SMARTREADY call for proposals

SRI Cluster

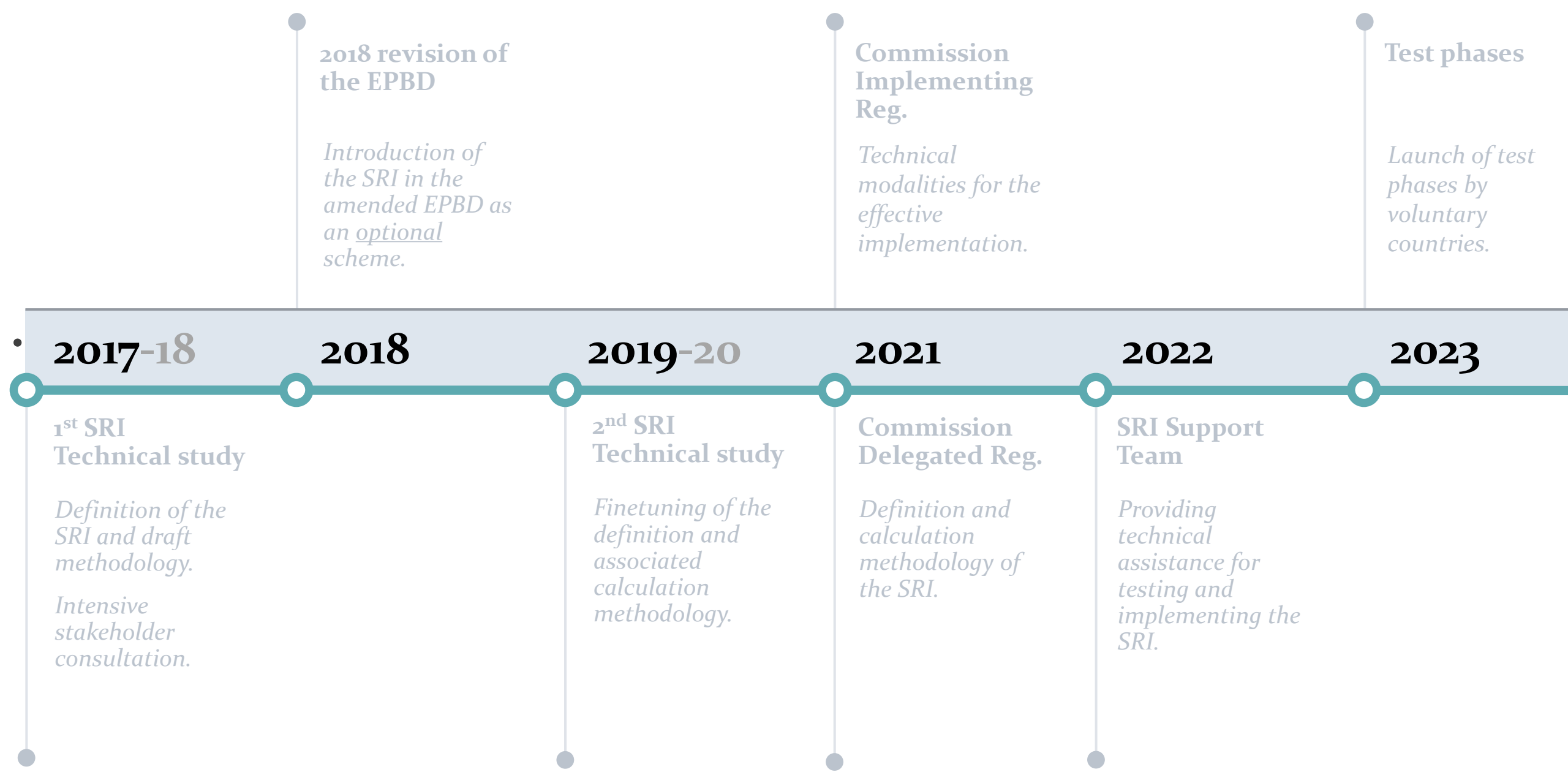Project presentations, with worked examples.

Panel discussion

The amended EPBD
Directive (EU) 2018/844
introduced the
Smart Readiness Indicator

Outlined the impact of the energy system digitalisation in the energy landscape, from the integration of renewables to smart grids and **smart buildings**.

2018 revision of the EPBD

Introduction of the SRI in the amended EPBD as an optional scheme.

Commission Implementing Reg.

Technical modalities for the effective implementation.

Test phases

Launch of test phases by voluntary countries.

2017-18

2018

2019-20

2021

2022

2023

1st SRI Technical study

Definition of the SRI and draft methodology.

Intensive stakeholder consultation.

2nd SRI Technical study

Finetuning of the definition and associated calculation methodology.

Commission Delegated Reg.

Definition and calculation methodology of the SRI.

SRI Support Team

Providing technical assistance for testing and implementing the SRI.

Material originally developed by the SRI support team: VITO, Waide Strategy Efficiency Europe, R2M, and LIST

The *smartness* of a building or building unit was defined as to its ability to sense, interpret, communicate, and actively respond in an efficient manner to changing conditions in relation the operation of technical building systems, the external environment, and demands from building occupants.
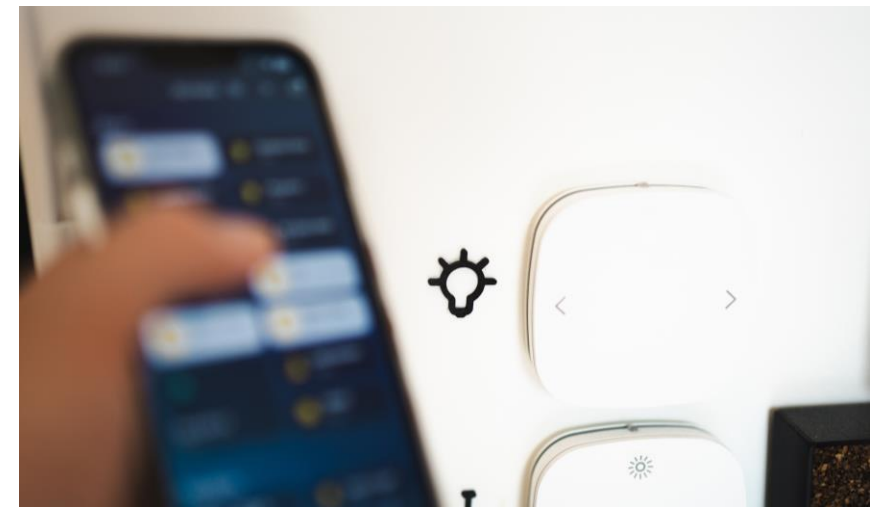
SRI
Core methodology

As defined by the **Commission Delegated Regulation 2020/2155**

The SRI methodology is structured in **three key smart readiness functionalities**, within which there are certain **impact criteria**.

The SRI assesses nine **technical domains**.

For each technical domain, **smart-ready services shall be defined by Member States**, as part of a smart-ready catalogue. Additionally, Member States shall define **weighting factors** characterising the impact of each technical domain in each impact criteria, of each impact criteria in each key smart readiness functionalities, and of each functionality in the total score.
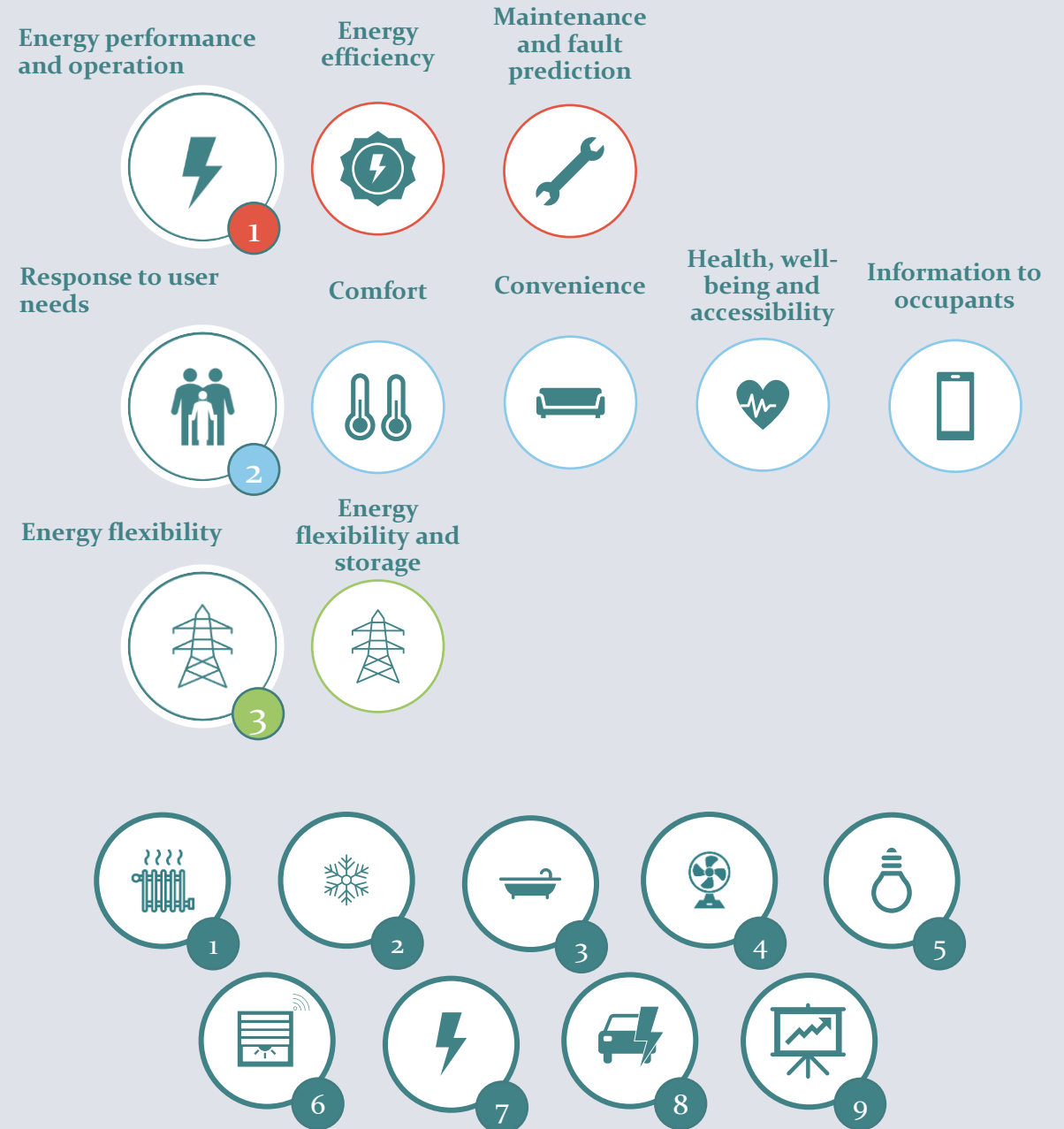
SRI modalities & implementation

As defined by the **Commission Implementing Regulation 2020/2156**

Member States may decide to apply it on a **voluntary** or **mandatory** basis.

Member States shall define the **requirements for experts** to qualify for issuing SRI certificates.

Member States may decide to couple the issuing of the SRI with other assessments, such as the **energy performance certificate** or with existing schemes for **inspection of technical systems**.

Member States may undertake a non-committal test phase of the SRI at national level. If adopted, the SRI shall be controlled, monitored and promoted.

Accreditation and qualification of SRI experts

Issue of the **SRI certificate**

Coupling with **EPC** and **inspection** schemes

Monitoring and **promotion** of the SRI

Testing of the SRI scheme.

LIFE-2021-CET
SMARTREADY

Creating the conditions for a global improvement of smart readiness of European buildings

The objectives of the topic are:

- The **implementation** of the Smart Readiness Indicator.

- The **market up-take** of the Smart Readiness Indicator.

- The **rollout of ICT and smart-ready technologies** (e.g., BMS, smart meters, smart thermostats, sensors, Internet of Things (IoT) devices, smart e-mobility charging infrastructure) in residential, public and commercial buildings.

- The **protection of privacy and cybersecurity** of smart buildings.

- The **reduction of energy consumption** linked to the use of digital technologies.

SRI Cluster

SRI2MARKET

Régis Decorme

SRI-ENACT

Apostolis Arsenopoulos

European Commission

Sylvain Robert

SMART²

Paris A. Fokaides

easy SRI

Nikos Katsaros

SRI2Market. *Development of National SRI Schemes in EU Member States*

SRI-Enact. *Training and Awareness Raising for the SRI*

Smart Square. *SRI Methodology, Walk Through Audits, and Standardization*

easySRI. *SRI Tools and Worked Examples*

Agenda

Panel discussion on SRI implementation and benefits

SRI2Market.

Development of National SRI Schemes in EU Member States

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SRI2MARKET

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

Development of national SRI Schemes in EU Member States

National SRI developments

The SRI is currently being officially tested in 8 EU countries: Austria, Croatia, Czech Republic, Denmark, Finland, France, Slovenia and Spain.

LIFE CET SRI projects support Member States to successfully plan the rollout of the SRI in their national regulation and markets.

In particular, the SRI projects support 14 Member States: Austria, Bulgaria, Croatia, Cyprus, Czechia, France, Germany, Greece, Italy, Latvia, the Netherlands, Portugal, Romania and Spain.

SRI2MARKET

Main Objectives

Member States with official test phases launched or with a decision to launch an official test phase

- complement planned national activities

- make a link between the national test phases and the thematic SRI working groups

- showcase successes and obstacles of the testing phases so that other Member States can learn from them

Member States with active interest in the SRI

- support to move forward with designing and implementing a testing phase

- act as a catalyst for accelerating the relevant policy decisions by initiating stakeholder dialogues and making a series of tools and use cases available

- engage national policy and market stakeholders so that to create interest in the SRI and the opportunities that may emerge from it

SRI2MARKET

Austria

A current national project "SRI - Analysis & Test Phase Austria" intends to support the SRI testing phase in Austria. The national project is carried out through the cooperation of:

- BMK (Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology)
- OIB (Austrian Institute of Construction Engineering - The SRI falls under the coordination and implementation of the OIB)
- AEE INTEC (Institute of Sustainable Technologies)
- BOKU (University of National Resources and Life Sciences Vienna)

SRI2MARKET

Projects involved: SRI2MARKET, easySRI, SRI-ENACT

Croatia

The SRI test phase in Croatia is led by the Ministry of Physical Planning, Construction and State Assets and is supported by the Energy Institute Hrvoje Pozar (EIHP).

The decision for the test phase was influenced by the funding of the SRI2MARKET.

SRI2MARKET

Projects involved: SRI2MARKET, SRI-ENACT

France

The French test phase is led by the Ministry for Ecological Transition with the support of CEREMA.

R2M is currently supporting the official French SRI testing phase in the context of the EC DG ENER technical assistance service for testing and implementation of the SRI.

SRI2MARKET will target industry actors – manufacturers of smart building technologies and real estate actors – to demonstrate how the SRI can increase the market up-take of smart building technologies.

SRI2MARKET

Projects involved: SRI2MARKET

Portugal

DGEG (Directorate-General for Energy and Geology) is the national authority in charge of implementing the EPBD requirements, including the SRI.

ADENE is the responsible authority in Portugal for the Energy Performance Certification (EPC) scheme and will play a pivotal role in the design of the national SRI rollout.

DGEG and ADENE have already engaged in informal conversations on the implementation of the SRI.

SRI2MARKET

Projects involved: SRI2MARKET

Spain

The SRI test phase in Spain is led by the Ministry for the Ecological Transition and the Demographic Challenge.

IDAE (Institute for Diversification and Energy Saving) is the public organization in charge of the EPC schemes, as well as the SRI instrument.

CENER and EFINOTATIC are technical partners of IDEA, and part of the group of developers chaired by IDAE to provide technical perspective and advice regarding the future evolution and development of the EPC in Spain.

SRI2MARKET

Projects involved: SRI2MARKET, easySRI, SRI-ENACT

Cyprus

The Ministry of Energy, Commerce and Industry is the Competent Authority for Energy Performance of Buildings legislation. There is a well-established collaboration between the Ministry and the **CEA**.

Projects involved: SRI2MARKET, easySRI, SmartSquare

Greece

The Centre for Renewable Energy Sources and Saving (CRES) is the authority responsible for the Energy Performance of Buildings legislation, including the activities related to the SRI implementation.

Projects involved: SRI2MARKET, easySRI, SmartSquare, SRI-ENACT

SRI2MARKET

Czechia

The Czech test phase is led by the Ministry of Industry and Trade (MPO), with support from the Department of Environmental and Building Services Engineering of the Czech Technical University in Prague (CTU).

During the test phase the common SRI methodology is applied, and depending on the sensitivity of the results, some adaptations may be undertaken in a later phase. SRI evaluations are conducted by the team of the University. The test phase should last around one year.

Projects involved: SRI-ENACT

SRI2MARKET

Bulgaria

Projects involved: SmartSquare, SRI-ENACT

Romania

Projects involved: SmartSquare, SRI-ENACT

The Netherlands

Projects involved: easySRI

Latvia

Projects involved: SRI-ENACT

Italy

Projects involved: easySRI, SmartSquare

Germany

Projects involved: SmartSquare

SRI2MARKET

Denmark

The Danish test phase is led by the Danish Energy Agency (DEA) in cooperation with the Danish Technological Institute (DTI).

The purpose is to investigate potentials and opportunities for the SRI in a Danish context.

SRI2MARKET

Not supported by a project

Finland

The SRI test phase in Finland is led by the Ministry of the Environment with the support of MOTIVA, a company dedicated to promoting and supporting sustainable development.

External assessors are going to be trained in order to conduct SRI assessments for a target of 150 buildings of different types.

The test phase should last around two years, comprising a social impact assessment and an evaluation of the suitability of the scheme to Finland.

SRI2MARKET

Not supported by a project

Slovenia

The SRI test phase in Slovenia is led by the Ministry for Environment, Climate and Energy with the support of Jožef Stefan Institute (Energy Efficiency Centre) and Goriška Local Energy Agency, in cooperation with the Horizon 2020 project TIMEPAC.

A sample of at least 50 representative buildings will be assessed, covering different typologies, ages and uses.

Assessments will be conducted by personnel from Jožef Stefan Institute and Goriška Local Energy Agency, and by external assessors to be trained through dedicated workshops. The test phase should last two years.

SRI2MARKET

Not supported by a project

Methodological approach

1. Take into consideration national specificities and priorities
2. Integration of EPC and SRI certification
3. e-learning lessons on the SRI
4. Repository of use cases for SRI upgrades
5. Setup of pilot campaigns at national level
6. National stakeholder dialogues

SRI2MARKET

Thank you!

SRI2MARKET

SRI-Enact.
Training and Awareness Raising for the SRI

2

Project Overview

Apostolis Arsenopoulos

Project Identity

- **Project Title:** Co-creating Tools and Services for Smart Readiness Indicator Uptake

- **Project Start:** 1st December 2022
- **Duration:** 30 months
- **Consortium:** 9 partners and 1 affiliated entity

  - ICT partners (SLG, SONE)
  - Researchers, Academia (NTUA)
  - Energy agencies and other energy experts (REGEA, BSERC, SEVEn)
  - Regional organisations (RPR)
  - Facility and energy managers (VEOLIA)
  - Service providers (ISPE)
  - Policy Makers & Public Authorities (EHP)

Country Coverage

Belgium

Czechia

Austria

Spain

8 Pilot Countries

Latvia

Bulgaria

Croatia

Romania

Greece

Project Objectives

STAKEHOLDER ENGAGEMENT

SRI-ENACT engages stakeholders at the national and EU levels in a co-creation process for the design of the SRI-ENACT approach

TOOLKIT

SRI-ENACT develops a web-based toolkit implementing the proposed SRI driven methodology

PILOT ASSESSMENT

SRI-ENACT trains 120 auditors who will assess 1,200 buildings across 8 EU Pilot Countries
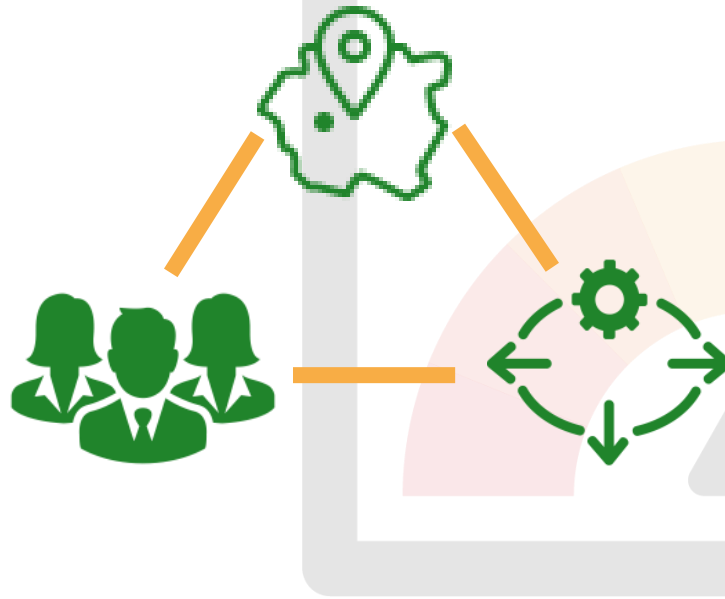
FINANCING SCHEMES

SRI-ENACT explores and develops concepts for the financing of building smartness upgrades

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Expected outcomes

Enhancing the smart readiness of buildings in specific national contexts

(on the basis of the national framework/ national regulations)

Training professionals (SRI auditors)

Design of new SRI financing & decision support tools

Project Scope

SRI-ENACT Assessment Tool

- Focus mainly on **the Method B** and rely on professionals third party assessors (**SRI auditors**)
- Adapted to **different national contexts** considering the climate conditions, the technologies present in the local markets and the main priorities set at policy level.

SRI-ENACT Decision Support Tool

- Rely on 1) data collected during the SRI assessments containing information about the building energy profiles; 2) information about potential building retrofit technologies (categorization, estimated costs etc.); 3) other data supporting "what-if" scenarios, e.g., estimated cooling energy demand based on the climate zone etc.
- Investigate the assessment of **potential retrofit technologies** covering supply-side management, demand side management and change of energy consumption patterns (human factor)

SRI-ENACT Capacity Building Programme

- Create the **SRI-ENACT guidebook**
- Develop at least 3 capacity modules focusing on the three SRI impact criteria

Co-creation Workshops

8 workshops with key stakeholders at the 8 pilot countries

GOAL : to engage a group of experts and policy-makers, forming the so-called **Stakeholder Liaison Groups**, to co-design a methodology that will enable the tailored SRI assessment in **national-specific contexts** and pave the way for the SRI-ENACT **pilot activities**
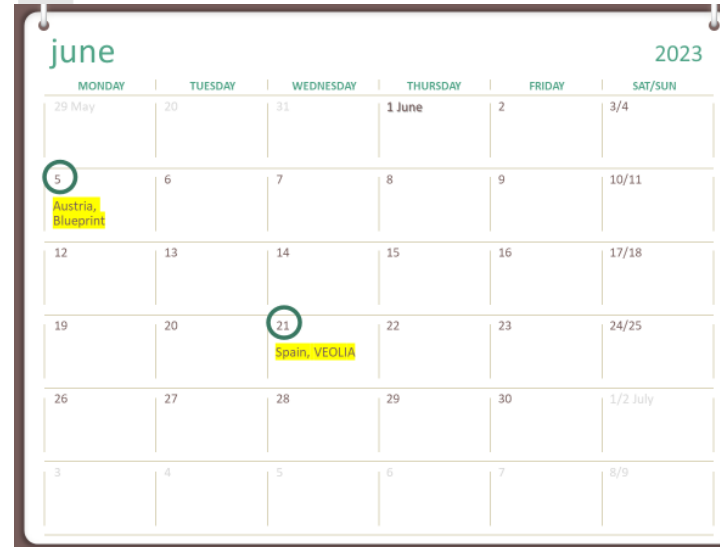
GREECE

- Participants from EasySRI, Smartsquare and SRI2MARKET projects, Ministry of Environment and Energy, Technical Chamber of Greece

- Discussion about the Greek national tailored SRI methodology

LATVIA

Participants from
- Ministry of Economy,
- Energy Agency of Riga,
- The State Construction Control Bureau,
- Technical University,
- Association of Energy auditors,
- Municipalities of the Riga Planning Region,
- Representatives of the private sector

SRI-ENACT
Co-creating Tools and Services
for Smart Readiness Indicator Uptake

BULGARIA

CROATIA

- The 11 participants included the key stakeholders (the 2 Government authorities in charge of SRI, the national energy efficiency fund, auditors, BMS suppliers, and others)

- Discussion about weightings for each type of building to be calculated based on data about previously certified buildings.

- 15 experts gathered who actively discussed the adaptation of SRI in Croatia (such as City of Zagreb, Ministry of Physical Planning, Construction and State Assets, Faculty of Electrical Engineering and Computing, Croatian Chamber of Electrical Engineers and more)

ROMANIA

- Representatives from:
  - Ministry of Development and Public Works,
  - National institute for research and development in construction
  - Auditors order and association,
  - Technical universities,
  - Municipalities,
  - Cluster for promotion of nZEB,

CZECHIA

- 8 participants in total, including 3 representatives from the Ministry of Industry and Trade
- Organizer: SEVEn, The Energy Efficiency Center

Feasibility study – Greece (1/2)

Tertiary or Residential?

- Hotels, office buildings, and industries are the most relevant…

- …but SRI will have biggest impact on residential.

Multi-Family Houses (MFH) or Single-Family Houses (SFH)?

- SFH have the highest primary consumption…
- …but most large cities feature MFH.

Geographical regions / climate zones?

- Almost half of the building stock are in zone B…
- …but energy consumption is much higher in zone C and D.

Recommendations

- Make SRI mandatory <u>only</u> for the buildings suggested by the EU (non-residential with large HVAC systems by 2026)
- Allow <u>all</u> typologies and regions to participate (as an add-on to EPCs)
- Use the testing phase to examine all categories

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Feasibility study – Greece (2/2)

Compulsory BACS
BACS become compulsory for non-residential buildings with large HVAC systems

Technical guidelines
The Technical Chamber of Greece develops technical guidelines for SRI in Greece (TOTEE)

EU projects on SRI
4 LIFE projects on SRI support, including tools and test assessments for numerous Greek buildings (to finish by mid 2025)

Assess public buildings
YPEN and CRES organise SRI assessments of public buildings participating in the ELECTRA program, based on the support and resources of the four LIFE projects

KENAK update
KENAK is extended with SRI provisions; SRI assessments become compulsory for non-residential buildings with large HVAC systems in Greece

2023   2024   2025   2026   2027   2028

Test phase starts in Greece
YPEN formally starts SRI testing in Greece, supported by the four LIFE projects that fund test assessments and train the first assessors

EC evaluates the national test phases
Early in 2026, the Commission publishes an evaluation report of the test phases of all participating Member States along with their feedback

Release the SRI tool
YPEN releases the tool for self-assessment and organises consultations with market actors to prepare SRI-compliant products

Train the trainers
The Technical Chamber of Greece develops and tests SRI training material and seminars

EPBD update
SRI becomes compulsory for non-residential buildings with large HVAC systems in the EU (conditional to the positive evaluation of the test phases)

Support SRI in other building types
Include SRI-relevant improvements in the eligible funding of Eksikonomo program for SMEs and residential buildings

Stakeholder Liaison Groups Activities

SRI ENACT will establish 8 National Stakeholder Liaison groups in the 8 Pilot EU countries and a EU Stakeholder Liaison Group

Testing — Scale-Up — Replication

Project month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Calendar month	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25
Establishment of the national liaison group	Identify and invite members				Update the composition of the Group - e.g. new members																									
Tailoring of SRI methodology to country				Roundtables, interviews, focus groups with stakeholders																										
Find buildings for pilot SRI assessment				Group members contact building owners, managers, and users to participate in SRI assessment																										
Recruitment of SRI auditors				Group members identify and recruit SRI auditors to participate in training courses and pilot assessments																										
Promotion and dissemination				Promote Info Days, SRI-ENACT pilot assessments, auditor training opportunities / Promote SRI-ENACT methodology and toolkit																										

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Thank you

Apostolis Arsenopoulos

Smart Square.
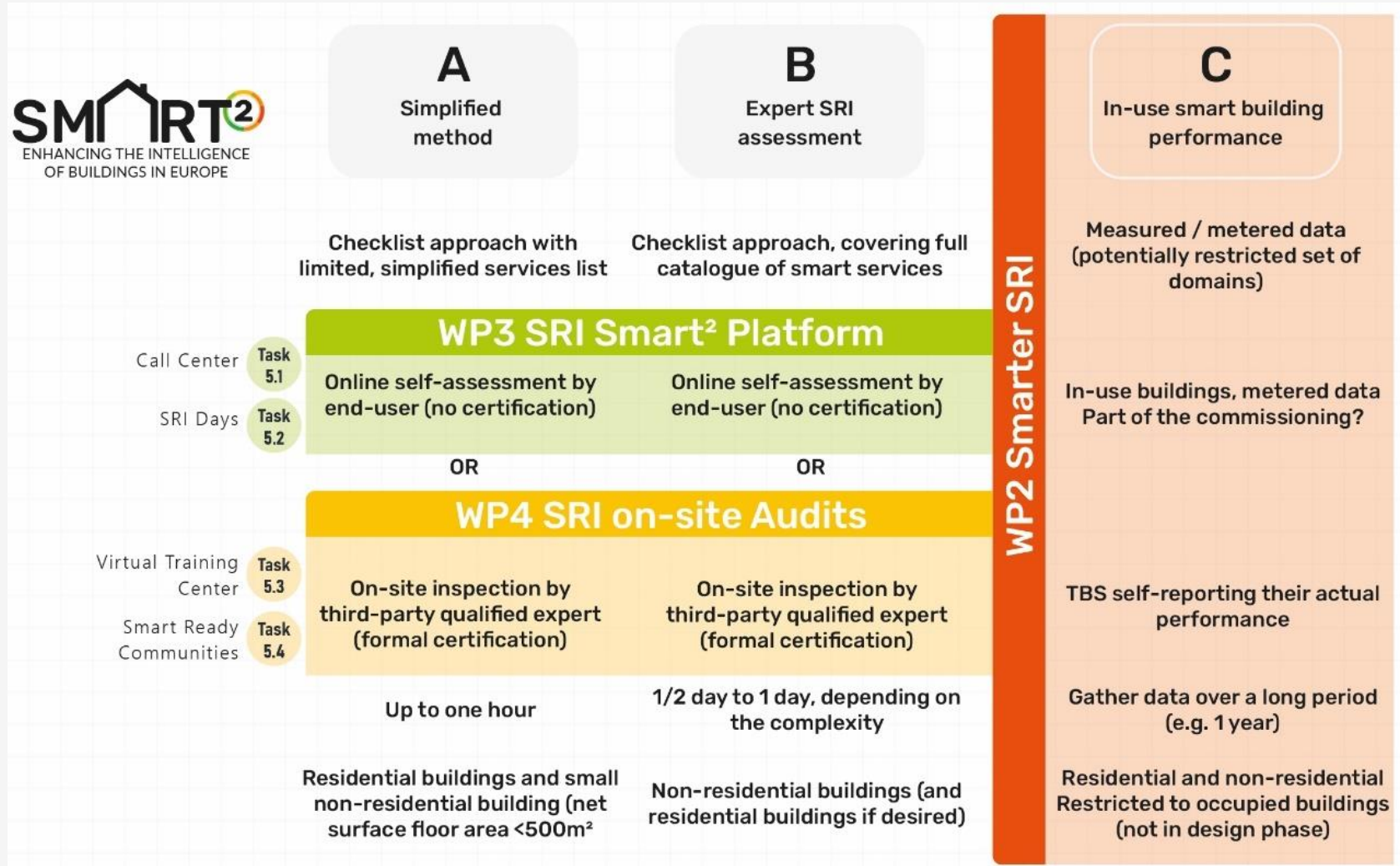*SRI Methodology, Walk Through Audits, and Standardization*

3

Smart² Proposition

- The project **Smart Tools for Smart Buildings**: Enhancing the intelligence of buildings in Europe (Smart²), aims to develop and deliver the appropriate tools and applications, which will enable the promotion and establishment of intelligence assessment of buildings in Europe, through buildings Smart Readiness Indicator (SRI) scheme.

- Smart² aspires to deliver **a cloud based open platform for assessing the intelligence of buildings, tailored for building designers, facility managers and building users**.

- Within Smart², the definition of **smartness cost optimal building upgrades**, as well as laying the grounds for the development and establishment of **cost optimal SRI minimum requirements** for new buildings will be defined. As part of the project, an SRI audit process will also be developed, with related protocols and procedures, with the aim to act as the forerunner of a standardized procedure.

- Smart² will also enable the smartness assessment of buildings with the use of real time data, based on the **in-use assessment method, focusing on interoperability gaps and cybersecurity aspects**.
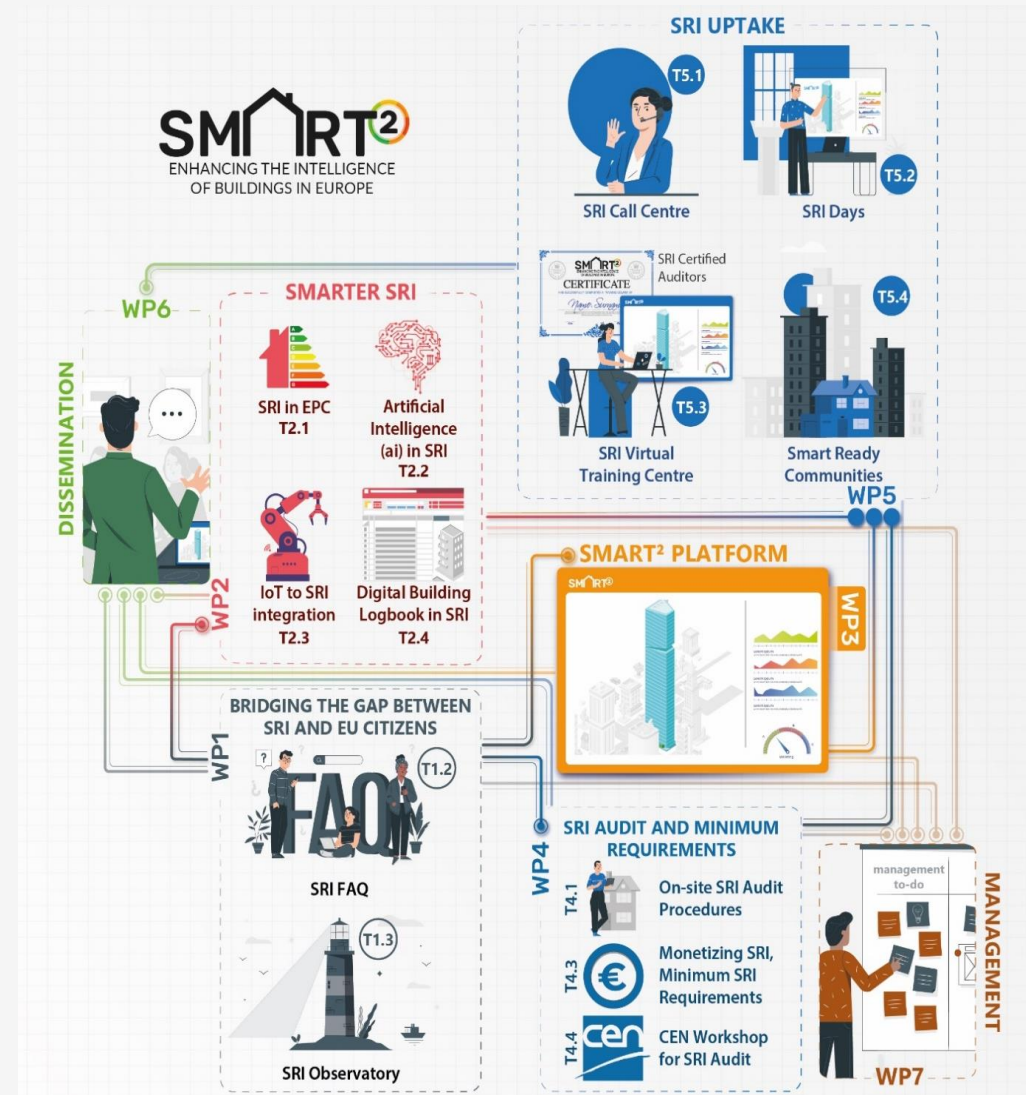
Alignement of Smart² with SRI Developments
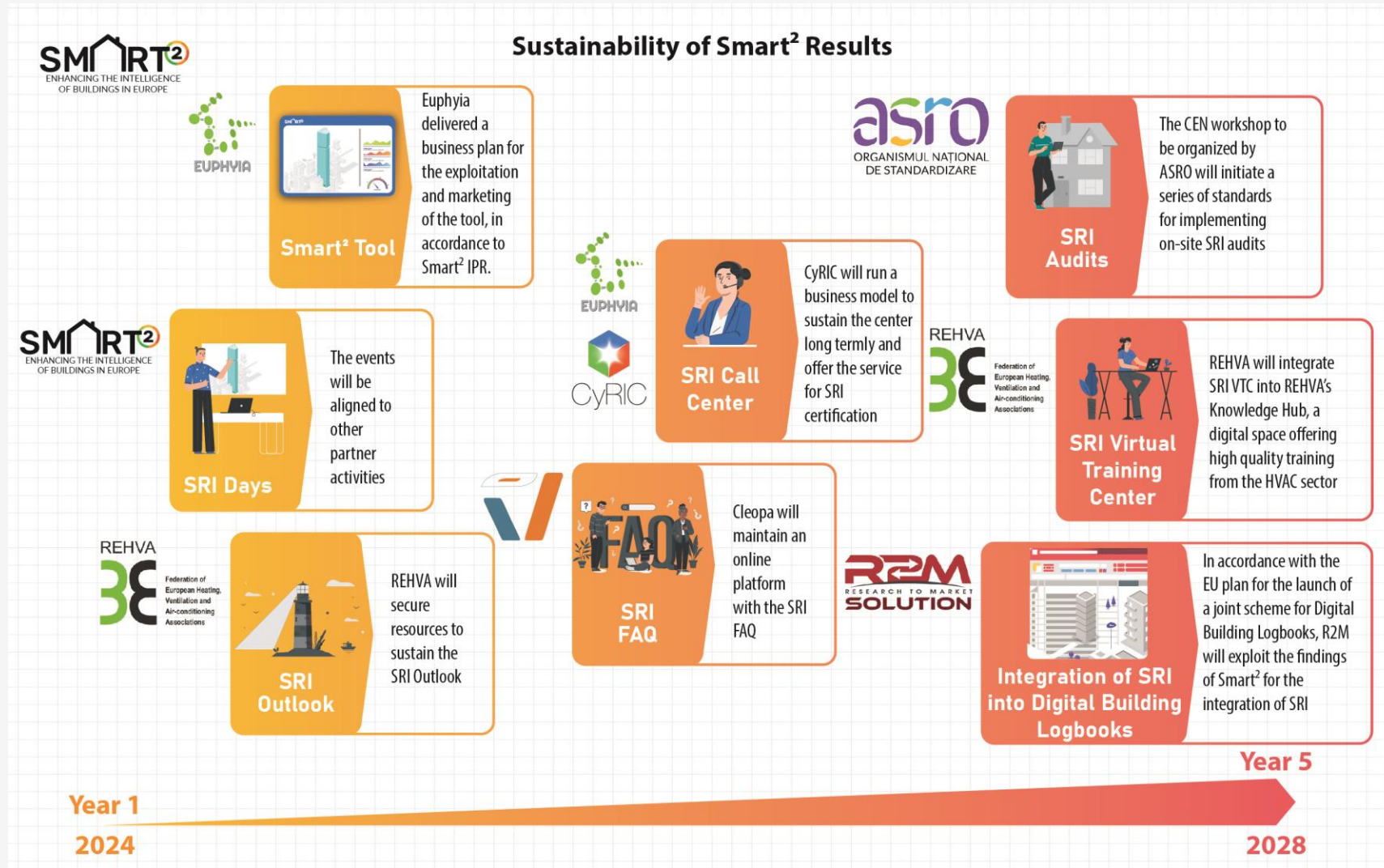
Smart Tools for Smart Buildings: Enhancing the intelligence of buildings in Europe – Smart²

Collaboration for efficient and sustainable buildings
Sustainable Places, Madrid, 15 June 2023

SRI Methodology, Walk Through Audits, and Standardization

Dr.-Ing- Paris A Fokaides
**Euphyia Tech**
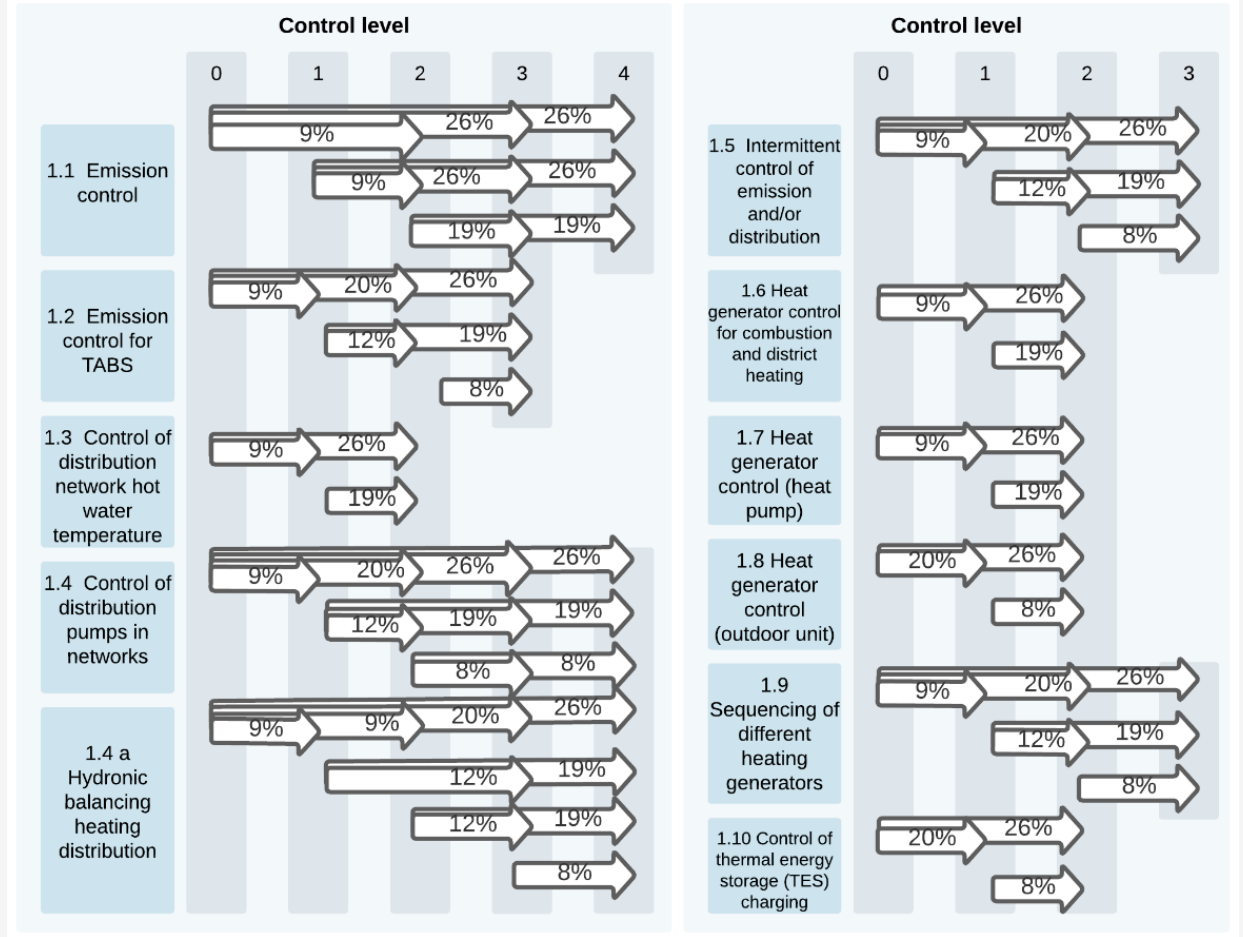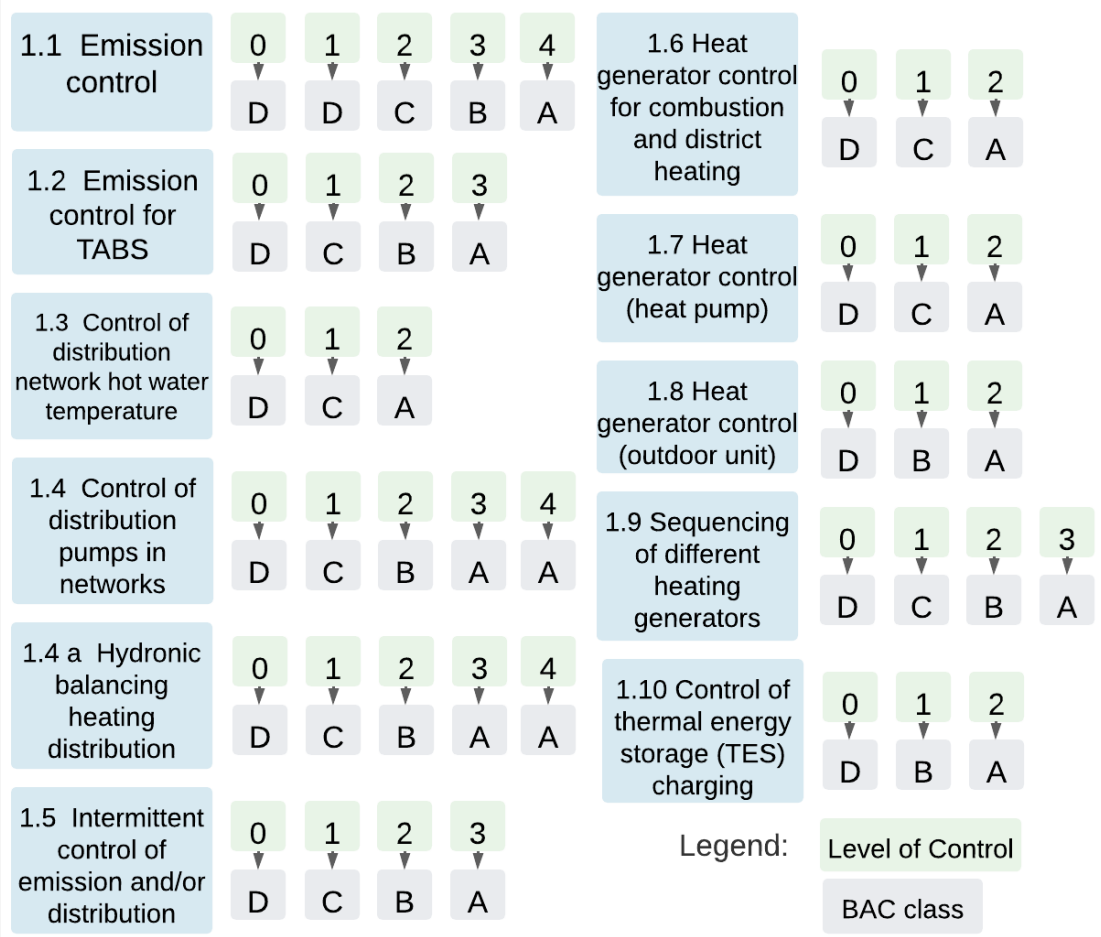**Technical and Scientific Manager**

- Despite the fact that **Articles 3 and 5 of the (EC) Regulation 2020/2156 indicate clearly that an SRI certificate shall be is-sued could be issued through an audit**, up to this point, there are no initiatives towards developing the standardized pro-cesses for conducting an SRI audit.

- On top of that, the final report on the technical support for the development of an SRI for buildings , refer to the **on-site SRI inspections**, both for the simplified (Method A) as well as the SRI expert method (Method B).

- Smart² aims to pave the way for the **development of the main principles for contacting on-site SRI building audits**. Based on these grounds, the Smart² project will attempt to adopt the audit procedures described in the EN 16247:2012 energy audit standard, with the aim to deliver a novel, SRI audit procedure.

- The outcome of this task, will be a **step by step SRI on-site audit procedure**, with the aim to become a harbinger of the development of an integrated, standardized process, for the performance of on-site SRI audits.

Adapting the 16247:2020:2 procedures for the SRI audit
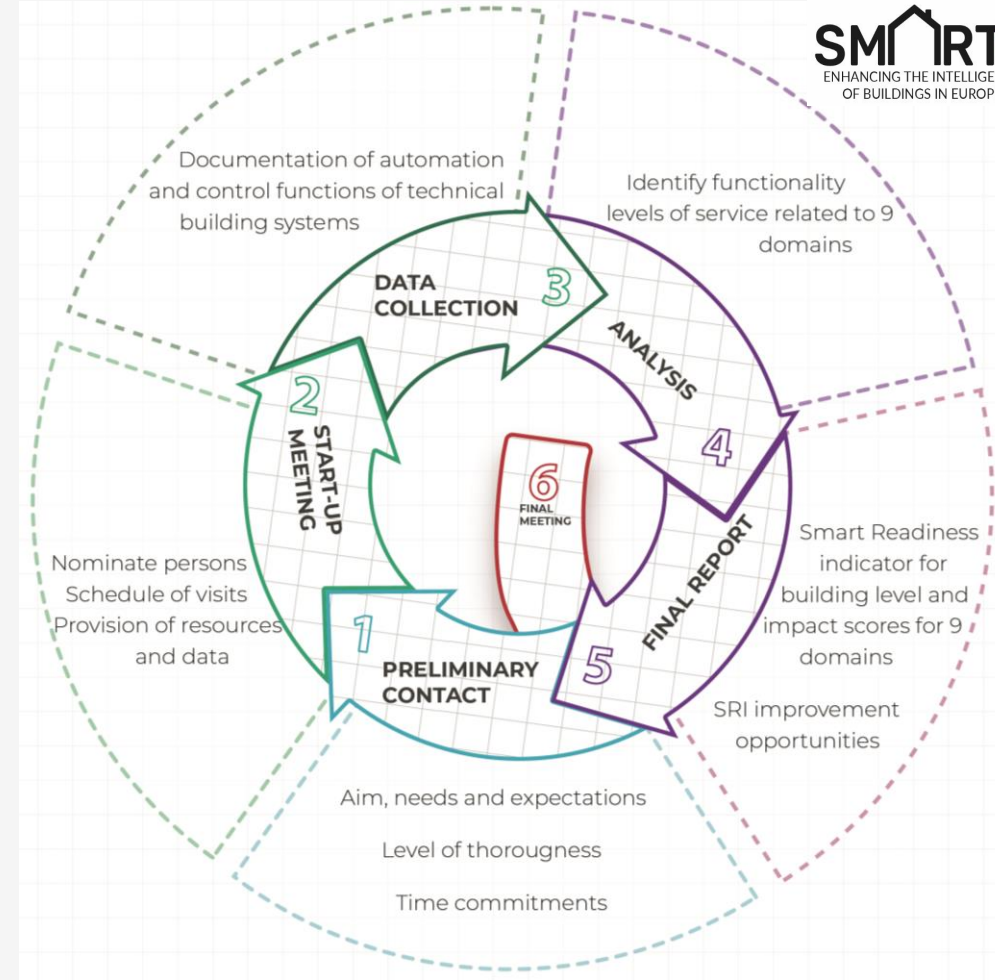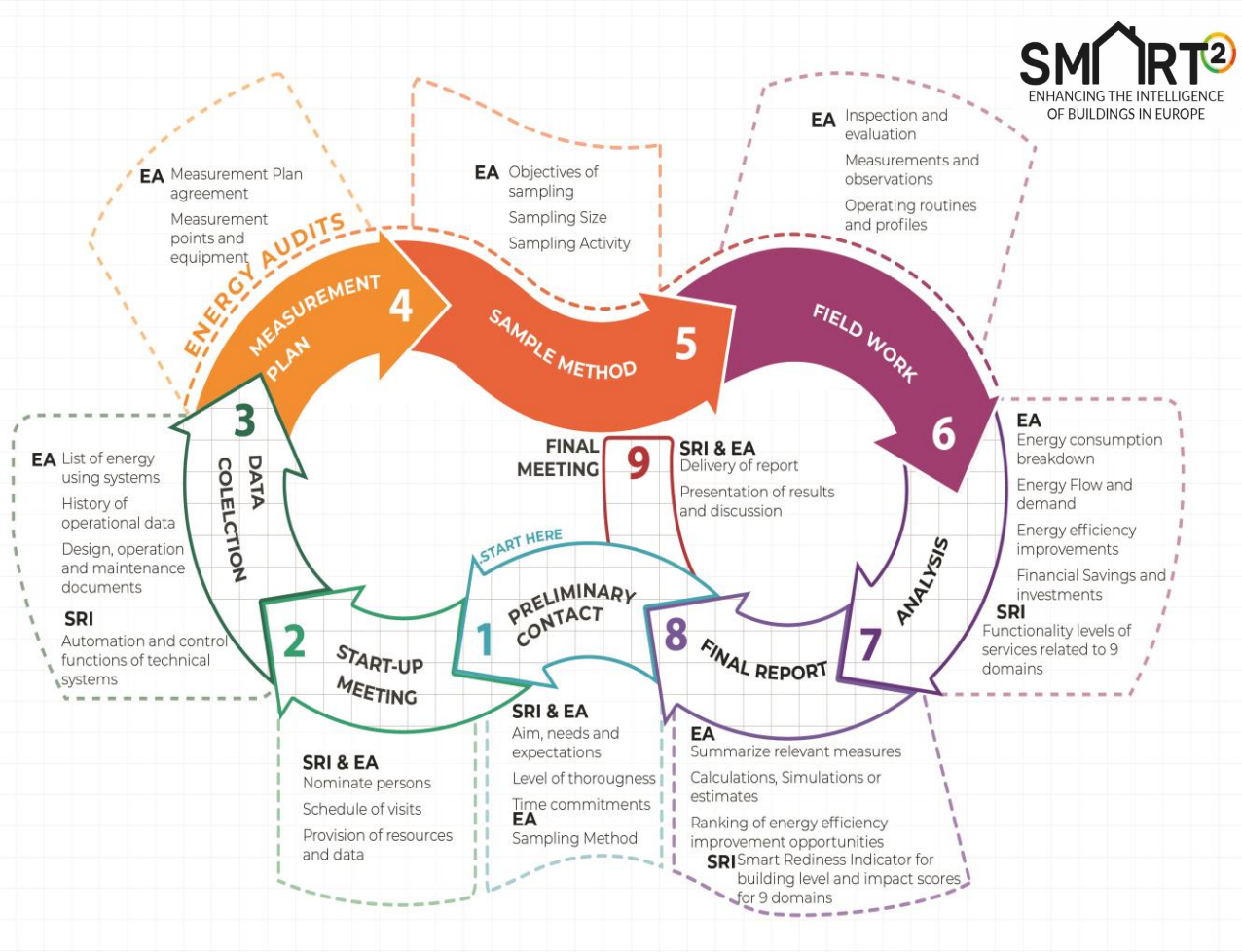
Smartness Upgrade Recommendations: The cost optimal

Analysis of Standardization Capabilities:

- Conduct an **analysis of the foreground of the project to determine its standardization capabilities**.
- Evaluate the **existing standardization environment** and identify areas for improvement.

Progressing Future Standardization Activity:

- Organize **a CEN Workshop** in accordance with the process outlined in CEN-CENELEC Guide 29.
- **Prepare a CEN Workshop Proposal** with the assistance of ASRO.
- **Submit the proposal** to the CEN-CENELEC Director Standardization and relevant CEN and CENELEC Technical Committees for consultation.

Evaluation by CEN Technical Board:

- The CEN Technical Board **evaluates the proposal**.
- **Prepare a Workshop Draft Project Plan** and announce it on the CEN-CENELEC Website.

Validity and Implementation:

- The CWA (**CEN Workshop Agreement**) working documents will be valid for a minimum of 3 years.
- **Implement the SRI Audit workshop**, inviting stakeholders, sister projects of the LIFE-2021-CET-SMARTREADY call, and other partners in the field.
- Aim to develop a **knowledge hub in the field of SRI audit** through collaborative efforts.

Main Outcome:

- The main outcome will be a **CEN Workshop Agreement on the topic of SRI Audits**.

Challenges for cost optimality

- Cost optimality for smartness upgrade measures involves considering the impact on various parameters such as **energy efficiency, human comfort, and smart grids**. The Smart Readiness Indicator (SRI) addresses these three parameters, focusing on the potential benefits of smartness upgrades in buildings.

- The proposed methodology primarily focuses on **evaluating the energy efficiency aspect of smartness upgrades**.. By optimizing energy consumption, smartness upgrades reduce operational costs and contribute to a more sustainable environment.

- However, the **challenge lies in quantifying and monetizing the effects of smartness upgrades on human comfort and their integration into smart grids**. While smartness improvements undoubtedly enhance occupants' well-being, accurately assessing their monetary value is complex.

- Additionally, the **smooth integration of buildings into smart grids is crucial for efficient energy management and demand response programs**. By enabling two-way communication between buildings and the grid, smartness upgrades facilitate load balancing and grid stability. However, determining the economic benefits derived from this integration is a complex task, as it involves considering factors like demand-side management, grid optimization, and the potential for revenue generation.
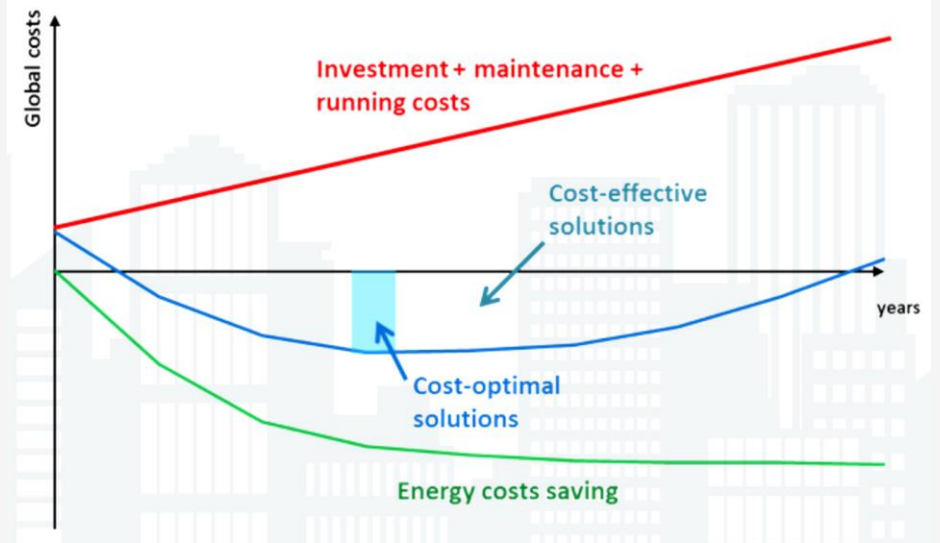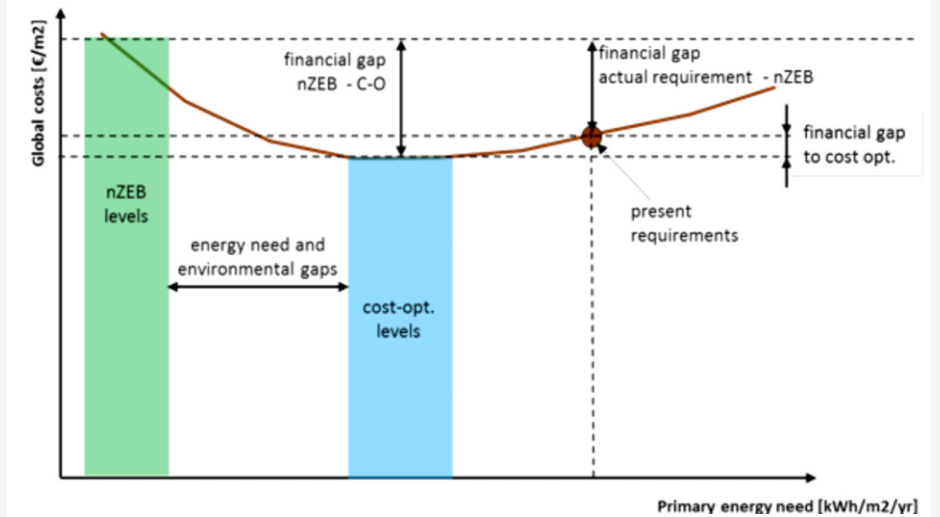
easySRI.
SRI Tools and Worked Examples

4

easySRI: Improving & demonstrating the potential of SRI

(LIFE21-CET-SMARTREADY-easySRI)

Project Identity Card

Grant Number	101077169
Project name	Improving & demonstrating the potential of SRI
Project acronym	LIFE21-CET-SMARTREADY-easySRI
Call/ Topic	LIFE-2021-CET/ LIFE-2021-CET-SMARTREADY
Type of action	LIFE Project Grants
Granting authority	European Climate, Infrastructure & Environment Executive Agency
Duration	36 months
Starting date	1 November 2022
End date	31 October 2025
Total eligible costs (BEN & AE)	€ 2,104,562.67
EU contribution	€ 1,999,334.53
Partners	CERTH (EL), FREDU (CY), E@W (IT), SGS (ES), SERA (AT), CETMA (IT), WSEE (IE), DEMO (NL), ASI (AT), CRES (EL)

easySRI Vision-Objectives

- <u>Main Aim</u>: enable an **extendable web platform and act as a basis** for effective implementation of SRI → allow further testing @ EU MS level

- <u>Introduce</u> additional parameters like **energy efficiency** & **financial aspects** → information more **understandable** and **quantitative** for the user of the building

- Implementation of **ML services** → assessment of building system's performance/ smartness → upgrade recommendations

- Promotion of **novel business strategies** → adoption & stakeholder engagement for utilizing SRI

- <u>Contribute</u> to possible update of **current standards** & **integration w/ other standards** → elevate SRI usability **in EU policy**

easySRI Outcomes/Results

- easySRI offers a **single platform** that combines:
  - A **SRI Calculation engine**,
  - A **SRI Wizard tool &**
  - A **ML-based core engine** identifying best SRI renovation solutions & making recommendations for upgrades.

- **Enables services** aimed to:
  - Promote & exploit the rollout of ICT & Smart Ready Technologies (SRTs)
  - Promote & disseminate the SRI adoption as a **standard index for evaluating** efficient building operation
  - Generate **new** "Green & Sustainable" **businesses**
  - Reduce (as indirect & inducted effect), **energy consumption** in buildings.

6 Pilot Sites
in Greece, Cyprus, Netherlands, Austria, Italy, Spain
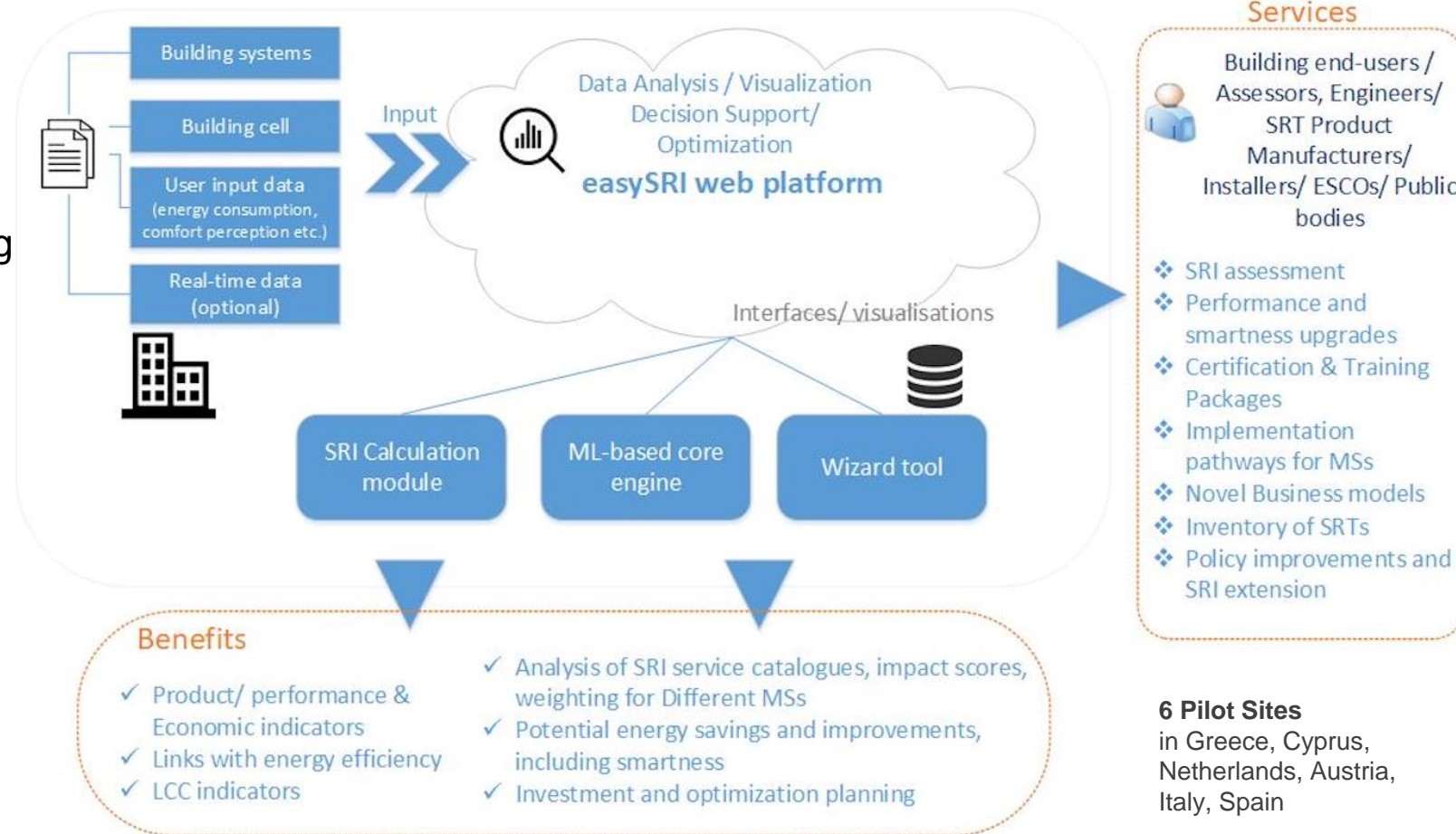
easySRI Expected Impact

easySRI as an interlink between two different client segments:

Group 1: Stakeholders aiming to renovate their **buildings** & increase their **SRI score**

Group 2: Stakeholders who can offer **products & services** for it.

Prototype will be exploited and extended

Generate a platform to act as a **"SRI-raising"** products & services solution.

Introduction to market & stakeholder engagement

Significant **impact** in terms of **implementation** & **market uptake** of SRI

Speed up the SRI advancements foreseen by national provisions in Europe.

Increase adoption rate of SRTs

The SRI framework

- The **Smart Readiness Indicator (SRI)** is a concept introduced by the **European Energy Performance of Buildings Directive (EPBD)**.

- It is a common framework developed by the European Union to **assess the smart readiness of buildings**.

- The SRI aims to evaluate the **integration of smart technologies** in buildings to **enhance energy efficiency** and **improve occupants' well-being**.

- It was introduced to **promote the use** of smart technologies and their potential benefits in the building sector.

- The SRI concept has been developed **collaboratively with Member States** and **stakeholders** in the building value chain.

- Member States are now encouraged to implement the SRI, potentially including **a preliminary test phase**.

Impact Criteria

- The **three main functionalities** related to smart readiness can be expanded upon to form **seven distinct impact criteria**

Technical Domains

- The **calculation methodology** of the SRI relies on evaluating the smart-ready services. These services are categorized **into nine technical domains**.

Heating

Cooling

Domestic hot water

Ventilation

Lighting

Dynamic building enveloppe

Electricity

Electric vehicle charging

Monitoring and control

SRI digital calculation tools

- There are currently **several initiatives** to develop **digital tools** that support the implementation of SRI assessments,
- They also provide **complementary SRI-related services** to improve smartness of buildings.

+ D^2EPC Building Performance Module-SRI Calculation Subcomponent
+ EPC-RECAST BIM supported SRI assessment tools
+ Smart-Ready-Go®
+ Smart2B Smart performance assessment & Advisor (SPA&A)
+ SRI2MARKET platform
+ SRI Calculator in IsZEB Certify
+ U-CERT Smart Readiness Indicator (SRI) digital tool

Source: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/smart-readiness-indicator/sri-implementation-tools_en#sri-digital-calculation-tools

SRI assessment package v4.5

SUSTAINABLE PLACES 2023

USE CASE: nZEB Smart House DIH, Mixed-use, Thessaloniki Greece

- **STEP 1:** Definition of general building information and selection of the applied methodology

GENERAL BUILDING INFORMATION

Building type	non-residential
Building usage	non-residential - healthcare
Location	Greece
Climate zone:	*South Europe*
Total useful floor area of the building	200 - 500 m²
Year of construction	> 2010
Building state	Original

Please provide a brief description of the building

Address: EKETA

METHODOLOGY SELECTION

Preferred weightings	Default
Preferred services catalogue	B

Domains present

Are the following technical building systems present in your building?
If not, are they mandatory for new constructions in your country of residence?
1 - This domain is present; 2 - This domain is absent but mandatory; 0 - This domain is absent and not mandatory

Heating	1
Domestic hot water	0
Cooling	1
Ventilation	1
Lighting	1
Dynamic building envelope	1
Electricity	1
Electric vehicle charging	1
Monitoring and control	1

Package source: https://ec.europa.eu/eusurvey/runner/SRI-assessment-package
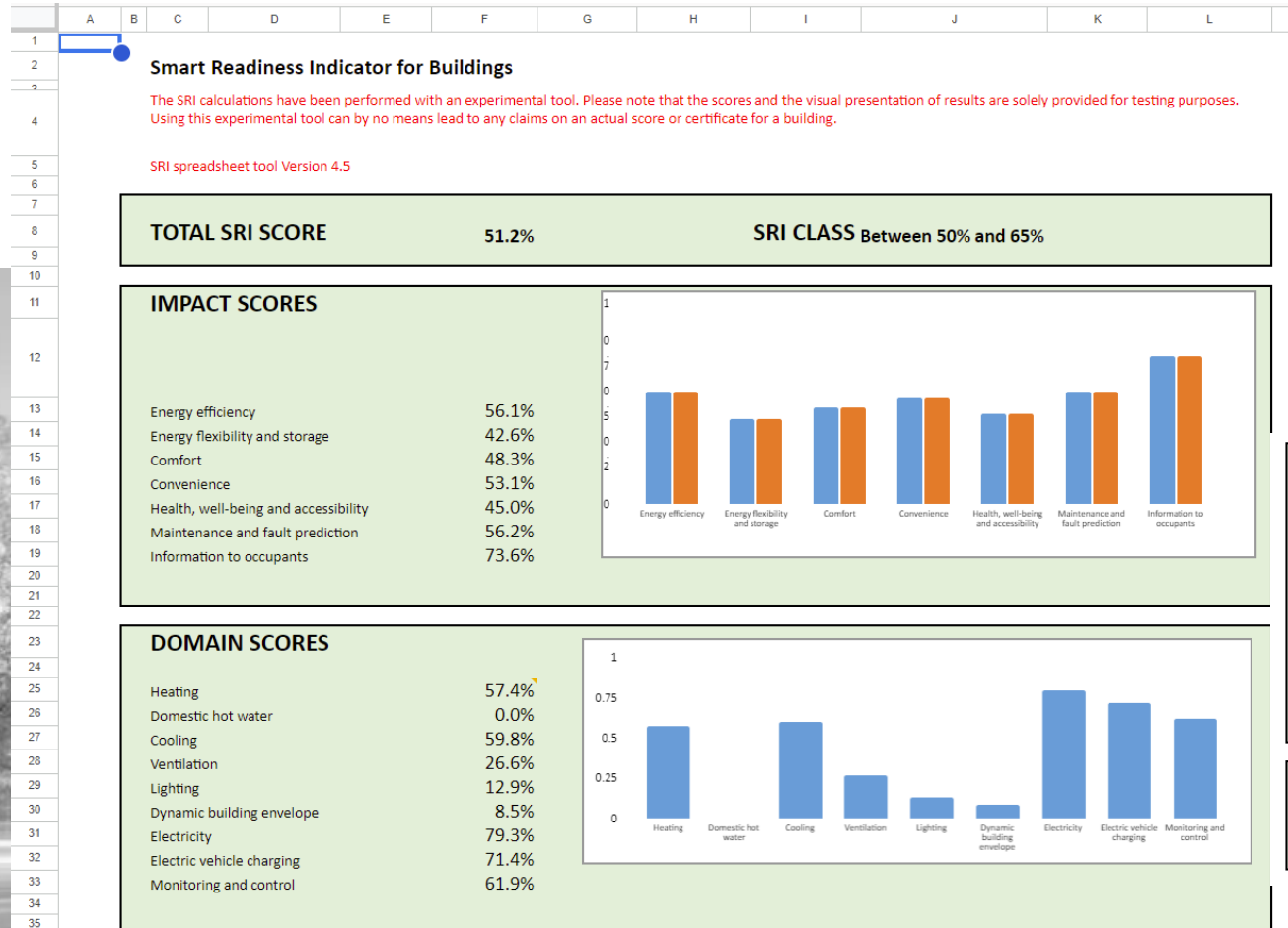
USE CASE: nZEB Smart House DIH, Mixed-use, Thessaloniki Greece

- **STEP 2:** The provision of information for the services applicable to the building under study.

Code	Service group	Smart ready service	Service included in the selected method (A/B/custom): 0 - not included, 1 - included	1 - This domain is present; 2 - This domain is absent but mandatory; 0 - This domain is absent and not mandatory	TRIAGE: 1 - This service affects maximum obtainable score, even if service is not applicable in this building; 0 - This service does not affect maximum obtainable score when not present in building	Service applicable in your building? - to be assessed by the assessor: 1 - applicable; 0 - not applicable	Main functionality level as inspected by SRI assessor	share (default = 100% means applicable throughout the building)	Optional: additional functionality level in part of the building	Share of additional functionality level	Warnings	Functionality level 0 (as non-smart default)	Functionality level 1	Functionality level 2	Functionality level 3	Functionality level 4	Service part of the method and domain selection?	Service applicable?	Optional for Estimated (minutes)
H-1a	Heat control - demand side	Heat emission control	1	1	0	1	3	100%		0%		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	1	1	
H-1b	Heat control - demand side	Emission control for TABS (heating mode)	1	1	0	0		100%		0%							1	0	
H-1c	Heat control - demand side	Control of distribution fluid temperature (supply or return air flow or water flow) - Similar function can be applied to the control of direct electric heating networks	1	1	0	1	2	100%		0%		No automatic control	Outside temperature compensated control	Demand based control			1	1	
H-1d	Heat control - demand side	Control of distribution pumps in networks	1	1	0	0		100%		0%							1	0	
H-1f	Heat control - demand side	Thermal Energy Storage (TES) for building heating (excluding TABS)	1	1	0	0		100%		0%							1	0	
H-2a	Control heat production facilities	Heat generator control (all except heat pumps)	1	1	0	0		100%		0%							1	0	
H-2b	Control heat production facilities	Heat generator control (for heat pumps)	1	1	0	1	2	100%		0%		On/Off-control of heat generator	Multi-stage control of heat generator capacity depending on the load	Variable control of heat generator capacity depending on the load or demand	Variable control of heat generator capacity depending on the load		1	1	

USE CASE: nZEB Smart House DIH, Mixed-use, Thessaloniki Greece

- **STEP 3:** Calculations using default or provided by user weighting factors

USER DEFINED

User-defined

DOMAIN WEIGHTINGS

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants
Heating	11.1%	12.5%	16.7%	11.1%	0.0%	14.3%	12.5%
Domestic hot water	11.1%	12.5%	16.7%	11.1%	0.0%	14.3%	12.5%
Cooling	11.1%	12.5%	16.7%	11.1%	0.0%	14.3%	12.5%
Ventilation	11.1%	12.5%	16.7%	11.1%	40.0%	14.3%	12.5%
Lighting	11.1%	0.0%	16.7%	11.1%	0.0%	0.0%	0.0%
Electricity	11.1%	12.5%	0.0%	11.1%	0.0%	14.3%	12.5%
Dynamic building envelope	11.1%	12.5%	16.7%	11.1%	60.0%	14.3%	12.5%
Electric vehicle charging	11.1%	12.5%	0.0%	11.1%	0.0%	0.0%	12.5%
Monitoring and control	11.1%	12.5%	0.0%	11.1%	0.0%	14.3%	12.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

IMPACT WEIGHTINGS

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants	
	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	100.0%

NOTE: some cells are set to zero and cannot be changed. This means that for these domains, the services have no impact on the given impact criterion.
=> no weight should be attributed.

DEFAULT WEIGHTING FACTORS

residential

DOMAIN WEIGHTINGS

North Europe

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants
Heating	0.30	0.43	0.20	0.1	0.2	0.31	0.11
Domestic hot water	0.09	0.13	0.00	0.1	0	0.10	0.11
Cooling	0.00	0.00	0.20	0.1	0.2	0.00	0.11
Ventilation	0.19	0.00	0.20	0.1	0.2	0.20	0.11
Lighting	0.04	0.00	0.20	0.1	0.2	0.00	0.00
Electricity	0.13	0.19	0.00	0.1	0	0.14	0.11
Dynamic building envelope	0.05	0	0.00	0.1	0	0.05	0.11
Electric vehicle charging	0	0.05	0.00	0.1	0	0	0.11
Monitoring and control	0.2	0.2	0.20	0.2	0.2	0.2	0.2
	1.00	1.00	1.00	1.00	1.00	1.00	1.00

West Europe

	Energy efficiency	Energy flexibility and storage	Comfort	Convenience	Health, well-being and accessibility	Maintenance and fault prediction	Information to occupants
Heating	0.34	0.46	0.20	0.10	0.20	0.35	0.11
Domestic hot water	0.08	0.10	0.00	0.10	0.00	0.08	0.11
Cooling	0.03	0.04	0.20	0.10	0.20	0.03	0.11
Ventilation	0.18	0.00	0.20	0.10	0.20	0.18	0.11
Lighting	0.01	0.00	0.20	0.10	0.20	0.00	0.00
Electricity	0.11	0.15	0.00	0.10	0.00	0.11	0.11
Dynamic building envelope	0.05	0.00	0.00	0.10	0.00	0.05	0.11
Electric vehicle charging	0.00	0.05	0.00	0.10	0.00	0.00	0.11
Monitoring and control	0.20	0.20	0.20	0.20	0.20	0.20	0.20
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

USE CASE: nZEB Smart House DIH, Mixed-use, Thessaloniki Greece

- **STEP 4:** Provision of the results/ scores

Panel discussion.
SRI Implementation and Benefits