



D6.1 – easySRI policy implications and national priorities report v1 (v1.0)



This project has received funding from the European LIFE Programme for Research and Innovation under grant agreement no 101077169. Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Project Acronym: easySRI

Project Full Title: Improving and demonstrating the potential of SRI

Grant Agreement: 101077169

Project Duration: 36 months (01/11/2022 – 31/10/2025)

DELIVERABLE 6.1

easySRI policy implications and national priorities report v1

Work Package: WP6 Untapping the potential of smart technologies

Task: T6.1 Translating easySRIs into improvements for EU and national policies and initiatives

Document Status: v1.0

File Name: easySRI_D6.1 Report_v1.0

Due Date: 30.04.2024

Submission Date: 30.04.2024

Lead Beneficiary: SERA

Dissemination Level

Public ☒

Confidential, only for members of the Consortium (including the Commission Services) ☐

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Version History

v	Author	Date	Brief Description
v0.1	Susanne Geissler	31 August 2023	First draft
v0.2	Susanne Geissler	13 October 2023	Comments on v0.1 addressed: Paul Waide, ASI, CRES
v0.3	Susanne Geissler	14 February 2024	General part completed (apart from chapter 4), Austrian case study completed, Greek case study included

	Andreas Androutsopoulos		
v0.4	Pavlos Papadopoulos	16 February 2024	Cyprus case study added
v0.5	Paul Waide	15 March 2024	Ireland case study added
v0.6	Susanne Geissler	15 March 2024	Draft completed
v1.0	Susanne Geissler	25 April 2024	Revision according to feedback from review

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Executive Summary

The report suggests ways in which the integration of main outcomes of the easySRI project to existing policies may occur. Furthermore, it is investigated how priorities at national level can be supported. This refers to the SRI impact categories and SRI impact indicators which represent thematically self-contained subject areas which are used to structure policies and initiatives, and allow responsible authorities, organisations and other stakeholders:

- Optimise energy efficiency and overall in use performance
 - Energy efficiency
 - Maintenance and fault prediction
- Adopt operation to the needs of the occupants
 - Comfort
 - Convenience
 - Health, wellbeing and accessibility
 - Information to occupants
- Adopt to signals from the grid
 - Energy flexibility and storage

In the first phase of the project the focus is on desk research, while in the second project phase the focus is on the interaction with stakeholders. Therefore, this report will be updated and enriched with results from stakeholder interaction at the end of the project.

The procedure consists of two main parts and their work steps: (1) SRI impact indicators are mapped to the EU policy framework and policy instruments to identify which SRI impacts are relevant to which specific policy frameworks, instruments, and initiatives; (2) National priorities and possible ways forward to translate easySRI results into improvements for EU policies and initiatives are identified.

This report is composed of 10 chapters. After presenting the Introduction including the scope and the objectives of the task in chapter 1, the Study methodology is presented in chapter 2. Chapters 3 to 9 present the material the analysis is based on:

- Chapter 3 Analyzing vehicles of EU policy instruments: The vehicles of the following thematic instrument at EU level are analyzed: Energy Performance of Buildings Directive, Renewable Energy Directive, Energy Efficiency Directive, Governance Regulation, Taxonomy Regulation, Corporate Sustainability Reporting Directive, Level(s), SME digitalization strategy.
- Chapter 4 Analyzing relevant elements of EU initiatives: Relevant Initiatives are the Next generation EPC cluster of projects, the SRI cluster of projects, and the digital building logbook. Linking with other projects can help disseminate easySRI findings. Regarding training, Build up Skills is the central program in the building sector. Guidance developed by easySRI could be made available to dedicated training platforms, or could be advertised and disseminated through the respective networks.
- Chapter 5 Approaches, areas and responsible stakeholders for introducing SRI: The introduction of SRI and easySRI results can be voluntary in the form of guidelines, quasi-mandatory if there is a link to funding, and mandatory if there is a legal obligation. Stakeholder discussion will be continued in the second phase of the project.
- Chapters 6-9 National priorities for incorporating SRI into policies and initiatives: The status quo in Austria, Cyprus, Greece, and Ireland is presented and will be updated in the second phase of the project.

This report closes with chapter 10 Conclusions and recommendations, including practical ways to incorporate easySRI findings into policies. The analysis results in the conclusion that priority should be given to easySRI links with the Taxonomy Regulation and ESG reporting according to ESRS. Real estate companies complain about the large number of certificates that are required in different contexts and the associated expenses for consultancy services. If the certificates generated with easySRI are also suitable as evidence for Taxonomy Annex I sections 7.3 to 7.7, and ESRS E1, E5 and S4, real estate companies would have a clear advantage from using the easySRI services.

The accordance with the digital building logbook is essential as it is not only mentioned in the EPBD but is also a focus set by DG GROW.

SRI impact indicators can support the provisions of the forthcoming EPBD recast in the area of technical building systems, EPC and the renovation passport. For the latter two, the focus is on recommendations to improve building performance. Regarding technical building systems, the focus is on the installation of BACS and the SRI certificate could be used as proof. However, the limitation of technical, economic and functional feasibility leaves room for excuses not to comply.

Appropriate processing of WP4 content will enable the link to these policy instruments and initiatives. In particular, this concerns the following tasks:

- easySRI core engine, including data input, calculation algorithms, and data output formats;
- easySRI service online web-application, including APIs, assessment results and certificates.

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List of Acronyms and Abbreviations

Term	Description
AI	Artificial Intelligence
BACS	Building Automation and Control System
BER	Building Energy Rating
BREEAM	Building Research Establishment Environmental Assessment Method
C	Cooling
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CSRD	Corporate Sustainability Reporting Directive
DBL	Digital Building Logbook
DEAP	Dwelling Energy Assessment Procedure
DEC	Display Energy Certificate
DGNB	Deutsche Gesellschaft für Nachhaltiges Bauen
DHW	Domestic Hot Water
DIY	Do it yourself
DNSH	Do Not Significant Harm
DSO	Distribution System Operator
EED	Energy Efficiency Directive
EPB	Energy Performance of Building
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ESG	Environmental Social Governance
ESRS	European Sustainability Reporting Standards
GFA	Gross Floor Area
H	Heating
HEDNO	Hellenic Electricity Distribution Network Operator
IoT	Internet of Things

L	Lighting
LEED	Leadership in Energy and Environmental Design
MS	Member State
NDC	Nationally Determined Contribution
NEAP	Non-dwelling Energy Assessment Procedure
NECP	National Energy and Climate Plan
nZEB	Nearly Zero Energy Building
OIB	Österreichisches Institut für Bautechnik – Austrian Institute of Construction Engineering
R&D	Research and Development
RED	Renewable Energy Directive
SEAI	Sustainable Energy Authority of Ireland
SME	Small and Medium-sized Enterprise
SRI	Smart Readiness Indicator
TBS	Technical Building Systems
V	Ventilation
VR	Virtual Reality
ZEB	Zero Emission Building

1 Introduction

1.1 Scope and objectives of Task 6.1

It is the objective of this task to increase the impact of easySRI findings on the various policy initiatives taken at European level. To this end, Task 6.1 suggests ways in which the integration of main outcomes of the project to existing policies may occur. Furthermore, it is investigated how priorities at national level can be supported.

In the first phase of Task 6.1, a detailed documentation of the status of European initiatives at the given time of the project is done and their aspects related to the SRI concept are identified. In addition, efforts are also dedicated to the results from the SRI test phase in EU countries, with special focus on the consortium partner countries. Reaching out to public authorities to identify their national level priorities (e.g. “Energy performance and operation”, “Response to the needs of the occupant” etc.) as well as the methods considered most appropriate for introducing and adopting the SRI in the national context (e.g. connection of the SRI to the EPC; connection of the SRI to major new constructions and renovations etc.) is considered for the second phase of Task 6.1 that will result in an updated version of the present deliverable.

Task 6.1 is based on the following work steps:

- Concept development for study methodology, including suggestion how to proceed at national level
- Revision of the concept based on the feedback of project partners
- Implementation of the study methodology
 - Identification of policies and initiatives at EU level, including existing and possible links with smart readiness, relevant authorities and other stakeholders
 - Identification of national priorities, jurisdiction and relevant contacts at national level
 - Compilation of results
- Recommendations regarding practical ways in which the findings of the easySRI project can be incorporated into existing European policies and initiatives as well as in support of national level priorities

1.2 Structure of the deliverable

The structure of report D6.1 is described below.

After presenting the Introduction including the scope and the objectives of the task in chapter 1, the Study methodology is presented in chapter 2. Chapters 3 to 9 present the material the analysis is based on:

- Chapter 3 Analyzing vehicles of EU policy instruments
- Chapter 4 Analyzing relevant elements of EU initiatives
- Chapter 5 Approaches, areas and responsible stakeholders for introducing SRI
- Chapters 6-9 National priorities for incorporating SRI into policies and initiatives: Austria, Cyprus, Greece, Ireland

This report closes with chapter 10 Conclusions and recommendations, including practical ways to incorporate easySRI findings into policies.

1.3 Relation to other tasks and deliverables

This task builds on WP2 easySRI specification and design and is carried out to complement the work done in WP3 Development of the implementation framework of easySRI with a broader and more forward looking perspective, in order to utilise the smart readiness potential of buildings as much as possible.

The stakeholder-needs matrix developed in Task 2.1 provides a good basis for identifying responsible authorities, organisations and other stakeholders. However, this task goes beyond the stakeholder-needs matrix because it is more strategic in nature and less tool-oriented, which was the focus in Task 2.1.

This deliverable thus provides not only further insights for the development of the easySRI platform, which is carried out in WP4 easySRI services and system, but also provides input for WP7 Sustainability, replication and exploitation of project results, and for developments beyond the easySRI project.

2 Concept development - study methodology

2.1 Overview of procedure

The procedure consists of two main parts and their work steps:

1. Mapping of the EU policy framework and policy instruments according to SRI impact indicators
 - Specification of SRI impact indicators used to identify European policies and initiatives.
 - European policies, instruments, and initiatives are analyzed regarding existing and possible links with smart readiness topics. To this end, a hierarchical approach is applied.
 - Relevant areas for introducing SRI impact indicators including responsible authorities, organizations and other stakeholders are identified.
2. Identification of national priorities and possible ways forward
 - National priorities are investigated according to the template developed to implement this task.
 - Possible ways forward are identified to translate SRIs into improvements for EU policies and initiatives.

Detailed information on specific work steps is provided in the following chapters.

2.2 Mapping of the EU policy framework

SRI impact indicators are mapped to the EU policy framework and policy instruments to identify which SRI impacts are relevant to which specific policy frameworks, instruments, and initiatives.

A mapping hierarchy is applied:

- The first level considers broad policy frameworks and their objectives, which are selected for analysis based on two criteria: (1) directly connected with energy and (2) impact on, or interlinkage with, other policies. Examples: Climate change, Energy Market, Health and wellbeing, Digitalization, etc.
- The second level considers the existent EU policy instruments and initiatives for each policy framework (e.g., EED, EPBD, RED, etc.).
- The third level considers the specific elements within the existent EU policy instruments and initiatives (e.g., EPCs, energy audits, etc.).

This way, the analysis moves from the broad policy frameworks, via the policy instruments to the policy instrument vehicles where concrete aspects can be identified where the SRI can be complementary to a specific vehicle.

2.2.1 SRI impact indicators and easySRI findings

Table 1 shows the SRI impact categories and indicators which represent thematically self-contained subject areas for which responsibilities can be defined later on. These subject areas are used to structure policies and initiatives and allocate responsible authorities, organisations and other stakeholders in the respective chapters of the main text of this document.

Table 1. SRI impact categories and impact indicators.

SRI Impact categories	SRI impact indicators
Optimise energy efficiency and overall in use performance	Energy efficiency
	Maintenance and fault prediction
Adopt operation to the needs of the occupants	Comfort
	Convenience
	Health, wellbeing and accessibility

	Information to occupants
Adopt to signals from the grid	Energy flexibility and storage

Subsequently, the role of the easySRI results of WP4 will be examined, in particular for the results of the following tasks:

- easySRI core engine, including data input, calculation algorithms, and data output formats;
- easySRI service online web-application, including APIs, assessment results and certificates.

2.2.2 EU policy frameworks, instruments and initiatives

Policy frameworks and instruments as well as relevant initiatives addressing the building sector are presented in Table 2. Thematic vehicles relevant for easySRI are identified. These thematic vehicles are analysed in the main text of this document regarding existing and possible links with smart readiness topics.

Table 2. Overview of policy frameworks, instruments, and initiatives.

Policy framework	Thematic instrument at EU level	Thematic vehicle
Clean energy for all Europeans package NDC according to Paris Agreement	Energy Performance of Buildings Directive	EPC Inspection of TBS Renovation passport Build up Skills
	Renewable Energy Directive	Renewable energy communities Increasing the share of renewable energy
	Energy Efficiency Directive	Exemplary role of public buildings Renovation rate of public buildings Energy audit
	Governance Regulation	National Energy and Climate Plan (NECP)
Green Deal	Taxonomy Regulation	Annex I Climate change mitigation - Evidence through certificates such as the EPC and audit by the chartered accountant
	Corporate Sustainability Reporting Directive	ESG Reporting according to European Sustainability Reporting Standards (ESRS)
	Level(s)	Level(s) compliance - Evidence through certificates
Digitalisation strategy	SME digitalisation strategy	Training Funding

Relevant Initiatives are the Next generation EPC cluster of projects, the SRI cluster of projects, and the Digital Building Logbook. Relevant elements of these initiatives are described in the main text of this document.

2.2.3 Areas and approach for introducing SRI, and responsible stakeholders

Relevant areas for introducing SRI including responsible authorities, organisations and other stakeholders are described. Introduction of SRI can be voluntary in the form of guidelines, quasi-mandatory if there is a link to funding, and mandatory if there is a legal obligation.

2.3 Investigating national priorities

2.3.1 Identification of national level priorities

Consortium partner countries involved in the task reach out to public authorities to identify their national level priorities:

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

National priorities for incorporating smart readiness are investigated in more detail at two levels:

- Incorporating smart readiness into the legal framework
- Incorporating smart readiness into voluntary approaches

This can be done by means of the following approaches:

- Case studies – contributions of participating countries
- Meetings with public authorities
- Workshops and round table discussions

In addition, questionnaires can be sent through European platforms to a wider target group of Member States. However, it is important to keep in mind that the response rate may be low, particularly in areas where legal frameworks are being investigated, as is the case with the SRI.

2.3.2 Case study approach – contribution of participating countries

National priorities for incorporating smart readiness are investigated in more detail at two levels:

- Incorporating smart readiness into the legal framework
- Incorporating smart readiness into voluntary approaches

The following procedure is applied:

1. Review existing national and regional regulations and policies related to building standards, energy efficiency, renewable energy, indoor air quality and health, and smart technologies; including identification of jurisdiction and relevant contacts at national level, analysis what works well and why and where are barriers and why. Important are voluntary building assessment schemes such as DGNB and specific national schemes which are also used for the public building stock and for funding programs.
2. Identify gaps or areas where new policies or updates are needed to facilitate smart readiness.
3. Identify key stakeholders in the relevant government agencies to discuss possible ways forward with them.

It is clear that the information on ongoing developments is informal.

3 Analyzing vehicles of EU policy instruments

This chapter consists of a short overview of European policies and initiatives, and then describes the respective vehicles in dedicated chapters, focusing on the parts relevant to easySRI.

3.1 Short description of thematic European policies and initiatives

Energy Performance of Buildings Directive (EPBD) [1–3]

The EPBD mandates energy efficiency improvements in buildings. In this context, building automation and control play a crucial role in these regulations by requiring the implementation of advanced systems for heating, cooling, lighting, and ventilation to optimize energy usage and maintain comfortable indoor environments.

The current EPBD is still under revision, the upcoming recast EPBD is expected to be published in April 2024.

Renewable Energy Directive (RED) [4] [5]

The RED primarily focuses on increasing the share of renewable energy in the EU's energy mix. Additionally, the directive recognizes the importance of electricity storage systems, such as batteries, to support the integration of intermittent renewable sources and ensure a stable and sustainable energy supply, including their potential use in buildings for optimizing energy consumption. On 9 October 2023, the EU Council adopted the amended Renewable Energy Directive ("RED III") that aims to increase the share of renewable energy in the EU's overall energy consumption to 42.5% by 2030.

Energy Efficiency Directive (EED) [6]

The EED aims to promote energy efficiency and reduce energy consumption. Among others, a key aspect of the directive is the focus on providing information to users, particularly consumers and businesses, to raise awareness about energy efficiency measures. It requires member states to implement programs and initiatives that empower users with information on energy-saving opportunities, energy-efficient products, and the benefits of energy conservation. The recast EED 2023 strengthens the ambition in reducing the EU's final energy consumption by 2030.

Governance Regulation and NECP [7]

The Governance Regulation and the National Energy and Climate Plans (NECPs) are both key components of the European Union's efforts to address climate change and transition to a more sustainable energy system. The Governance Regulation (EU) 2018/1999 establishes a framework for the governance of the Energy Union and climate action in the EU. It sets out the rules and procedures for Member States to develop and implement their National Energy and Climate Plans (NECPs) and ensures coordination and coherence in achieving the EU's energy and climate objectives. NECPs are comprehensive documents developed by EU Member States to outline their national strategies and policies for achieving the EU's energy and climate objectives. These plans cover a ten-year period and are updated every two years. NECPs play a crucial role in ensuring the alignment of national efforts with the EU's overall energy and climate objectives and in facilitating cooperation and coordination among Member States to achieve these goals.

Taxonomy Regulation [8]

The Taxonomy Regulation is a European Union (EU) framework aimed at creating a standardized classification system for sustainable economic activities. It defines criteria to determine whether an economic activity is environmentally sustainable, focusing on its contribution to climate change mitigation and adaptation, sustainable resource use, and protection of ecosystems. The regulation aims to provide clarity and transparency for investors, businesses, and consumers by setting clear standards for environmentally friendly investments. It is a key component of the EU's broader sustainability agenda, intended to drive capital towards green and sustainable projects, ultimately supporting the EU's goal of becoming carbon-neutral by 2050.

Corporate Sustainability Reporting Directive - Environmental Social Governance Reporting [9]

Environmental, Social, and Governance (ESG) is a framework that assesses a company's performance and impact in three key areas:

- **Environmental (E):** This aspect focuses on a company's environmental impact, including its efforts to reduce carbon emissions, conserve natural resources, manage waste, and promote sustainability. Companies with strong ESG practices often prioritize renewable energy adoption, waste reduction, and responsible resource management.
- **Social (S):** The social dimension of ESG evaluates a company's approach to social responsibility. It considers factors such as labour practices, employee well-being, diversity and inclusion, community engagement, and supply chain ethics. Companies with robust social ESG practices tend to prioritize fair labour standards, employee development, and positive community relationships.
- **Governance (G):** Governance assesses a company's leadership, ethics, and overall corporate structure. This includes evaluating board diversity, executive compensation, transparency, and anti-corruption measures. Strong governance practices ensure accountability, ethical decision-making, and protection of shareholder interests.

ESG criteria are used by investors, analysts, and organizations to assess a company's long-term sustainability and ethical impact.

The Corporate Sustainability Reporting Directive (CSRD) covers the area of non-financial reporting obligations certain types of companies must fulfil (in addition to the long-established financial reporting obligations). It aims to enhance quality, comparability, and reliability of ESG reporting among companies within the European Union (EU). Some of the requirements it puts forth for companies include:

- **Mandatory Reporting:** The CSRD expands the scope of companies required to disclose non-financial information, such as environmental, social, and governance (ESG) factors, beyond just large public-interest entities (PIEs). This means more companies will be obligated to report on their sustainability performance.
- **Standardized Reporting:** The directive seeks to standardize sustainability reporting by introducing mandatory sustainability reporting standards. This should make it easier for stakeholders to compare and evaluate companies' sustainability performance.
- **Materiality Assessment:** Companies will need to conduct a materiality assessment to identify and disclose information relevant to their business and stakeholders. This helps ensure that companies focus on disclosing the most significant ESG issues.
- **Digital Reporting:** The CSRD introduces digital reporting requirements, including the use of Inline eXtensible Business Reporting Language (XBRL) format. This aims to enhance the accessibility and comparability of sustainability data.
- **Audit and Assurance:** There are requirements for external assurance of sustainability reports to enhance credibility and reliability.

Level(s) [10]

Level(s) is an initiative developed by the European Commission as part of its efforts to promote sustainable construction practices in the European Union. It is a voluntary, performance-based reporting framework that helps assess and communicate the environmental, social, and economic sustainability of buildings and construction projects. Level(s) provides a standardized set of indicators and metrics that enable stakeholders to evaluate a building's environmental performance throughout its life cycle, from design and construction to operation and end-of-life. This framework is designed to support decision-making, encourage sustainable building practices, and contribute to the EU's overarching sustainability goals, including reducing greenhouse gas emissions and resource consumption.

Small and medium-sized enterprises (SMEs) digitalisation strategy [11]

The EU SME Digitalisation Strategy is an initiative to support the digital transformation of SMEs across Europe. It aims to empower SMEs to harness the potential of digital technologies and stay competitive in the digital age. The strategy focuses on three key pillars: access to digital infrastructure and technologies, fostering digital skills

and competencies among SMEs and their workforce, and promoting the digitalization of business processes and models.

3.2 Energy Performance Certificate

The Article on Energy Performance Certificates (EPC) of the upcoming EPBD [3] recast contains various provisions of which the following are relevant for easySRI, namely provisions on the EPC recommendations and provisions on the mandatory elements of the EPC.

Recommendations:

It is specified that the EPC shall include recommendations for the cost-effective improvement of the energy performance and the reduction of operational greenhouse gases emissions and the improvement of indoor environment quality of a building or building unit, unless the building or building unit already achieves at least energy performance class A.

The recommendations shall include an assessment of whether the heating, ventilation, air-conditioning and domestic hot water systems can be adapted to operate at more efficient temperature settings, such as low temperature emitters for water based heating systems, including the required design of thermal power output and temperature/flow requirements.

The recommendations shall include an assessment of the remaining lifespan of the heating and/or air conditioning systems. Where relevant, the recommendations shall indicate possible alternatives for the replacement of the heating and/or air-conditioning system, in line with the 2030 and 2050 climate targets, taking into account local and system-related circumstances.

When Member States choose to integrate a renovation passport, the renovation passport shall substitute the recommendations in the EPC.

Mandatory elements of the EPC:

The Annex provides a Template for the EPC specifying that the EPC shall also display the following elements:

- (a) the calculated annual primary and final energy consumption in kWh or MWh;
- (b) renewable energy production in kWh or MWh; main energy carrier and type of renewable energy source;
- (c) the calculated energy needs in kWh/(m².y);
- (d) a yes/no indication whether the building has a capacity to react to external signals and adjust the energy consumption;

Links with SRI and easySRI findings

With regard to the recommendations, the easySRI services could offer of recommendations for improving energy efficiency, user comfort and health and climate adaptability, and the associated costs. Once more it becomes evident that a well-designed TBS data collection format would be beneficial.

With regard to the mandatory elements of the EPC, it is clear that information required by point d) can be covered by the SRI.

3.3 Renovation passport

The upcoming recast EPBD [3] specifies the provisions on the renovation passport and provides even more details about the mandatory and voluntary content in the Annex. The scheme itself is voluntary, unless the Member State decides to make it mandatory.

Other provisions on the renovation passport are:

- Can be drawn up and issued jointly with the energy performance certificate.
- Shall be issued in a digital format suitable for printing by a qualified or certified expert, following an on-site visit.

- Contains a suggestion of the best steps to transform the building into a zero-emission building well before 2050.
- Strong recommendation to Member States to provide a dedicated digital tool for preparing and potentially updating the renovation passport.
- To be uploaded to the national database for the energy performance of buildings.
- To be stored in, or can be accessed via, the digital building logbook, when established.

Links with SRI and easySRI findings

The offer of a checklist for assessing the condition of all technical building systems, including building automation, during an onsite visit would be an incentive for experts to use easySRI services in connection with the creation of a renovation passport. Another incentive would be the offer of recommendations for improving energy efficiency, user comfort and health and climate adaptability, and the associated costs. It is important to link this to an EPC calculation program in order to prove that the identified measures have the potential to achieve the zero-emission standard by 2050.

3.4 Technical Building Systems

The upcoming recast EPBD [3] contains a dedicated article on technical building systems that are highly relevant to easySRI, with the exception of those paragraphs referring to fossil fuels. However, in some paragraphs there is the restriction "where economically and technically feasible" (grey mark in the table below), which experience has shown leads to weak implementation. Table 3 lists the relevant provisions including a comment regarding the relation to easySRI.

Table 3. Overview of TBS related provisions and relation to easySRI.

Provisions of Article on TBS	Comment regarding link with easySRI
Setting requirements for technical building systems to facilitate the effective installation and operation of low temperature heating systems in new or renovated buildings	BACS supports the implementation of system requirements
New buildings to be equipped with self-regulating devices for the separate regulation of the temperature in each room or zone	SRI service catalogue
Existing buildings to be equipped with self-regulating devices for the separate regulation of the temperature in each room or zone when heat or cooling generators are replaced	SRI service catalogue
MS set requirements for the implementation of adequate indoor environmental quality standards in buildings in order to maintain a healthy indoor climate	Indirectly relevant
Non-residential zero-emission buildings to be equipped with measuring and control devices for the monitoring and regulation of indoor air quality	SRI service catalogue
In existing buildings, the installation of such devices shall be required when a building undergoes a major renovation	SRI service catalogue
MS may require the installation of such devices in residential buildings.	SRI service catalogue
When a technical building system is installed, the overall energy performance of the altered part, and where relevant, of the complete altered system, is assessed	BACS supports the implementation of system requirements
Results shall be documented and passed on to the building owner, so that they remain available and can be used for the verification of compliance with the minimum requirements	easySRI platform could generate TBS report

When a technical building system is retrofitted or replaced, the energy performance of the system is to be optimised	easySRI platform could support implementation check
MS shall promote energy storage for renewable energy in buildings	SRI service catalogue
<p>Non-residential buildings are equipped with BACS, as follows:</p> <p>Non-residential buildings with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation</p> <ul style="list-style-type: none"> • of over 290 kW by 31 December 2024 • of over 70 kW by 31 December 2029 	easySRI platform could support implementation check
<p>The building automation and control systems shall be capable of:</p> <p>(a) continuously monitoring, logging, analysing and allowing for adjusting energy use;</p> <p>(b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;</p> <p>(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers;</p> <p>(d) monitoring of indoor environmental quality</p>	easySRI platform could support implementation check
<p>New residential buildings and residential buildings undergoing major renovations are equipped with the following:</p> <p>(a) the functionality of continuous electronic monitoring that measures systems' efficiency and informs building owners or managers in the case of a significant variation and when system servicing is necessary;</p> <p>(b) effective control functionalities to ensure optimum generation, distribution, storage, use of energy and, where applicable, hydronic balance;</p> <p>(c) a capacity to react to external signals and adjust the energy consumption</p>	easySRI platform could support implementation check
Exemptions possible for single residential buildings undergoing major renovation	Indirectly relevant
<p>Non-residential buildings are equipped with automatic lighting controls that are suitably zoned and capable of occupancy detection:</p> <p>with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation</p> <ul style="list-style-type: none"> • of over 290 kW by 31 December 2027 • of over 70 kW by 31 December 2029 	SRI service catalogue

Links with SRI and easySRI findings

Compliance with some provisions can be checked using the SRI service catalogue. Compliance with other provisions could be confirmed if the easySRI platform offers a corresponding service.

3.5 Build up Skills

Build-up Skills

The programme is a complementary activity to the EPBD implementation covering the training part. It promotes the adoption of energy-efficient construction techniques and renewable energy technologies, aligning with the EU's climate and energy objectives. Through the Build-up Skills program, the EU encourages the development of training programs and curricula that address the specific needs of the construction industry in the context of energy efficiency and sustainability. It supports partnerships between educational institutions, industry stakeholders, and vocational training centres to ensure a well-trained workforce. The program also seeks to raise awareness of the importance of sustainable construction practices and energy-efficient building standards among professionals and the public.

This initiative has been dealing with education and training in the field of construction and energy and the necessary further developments in the member states for several years, in Austria since 2011. While the initial target group was primarily craftsmen, the target group was expanded to include technical colleges and universities in current phase which is to be completed by end of March 2024. [12]

Links with SRI and easySRI findings

In the context of Build up Skills, training material has been developed. Guidance developed by easySRI could be made available to dedicated training platforms, or could be advertised and disseminated through the respective networks.

3.6 Increasing the share of renewable energy

The amended Renewable Energy Directive [5] stipulates more ambitious renewable energy targets.

Links with SRI and easySRI findings

Energy efficiency and grid flexibility and storage as documented by the SRI certificate are essential contributions to achieving the renewable energy targets.

3.7 Renovation rate of public buildings

The EED recast [6] article 6 obliges public buildings at federal, state, and municipal level to achieve a 3% renovation rate or to prove that equivalent energy savings are achieved by so called alternative measures. Implementation of appropriate building automation and control systems can generate substantial energy and cost savings, for example a time program for the operation of heating and ventilation in a school.

Links with SRI and easySRI findings

The easySRI platform could offer a special service for the public buildings sector, to assist with the implementation of Article 6 recast EED.

3.8 Energy audit

The EED recast [6] article 11 on Energy management systems and energy audits contains provisions on energy audits which are specified in more detail by means of minimum criteria set out in Annex VI:

The energy audits referred to in Article 11 shall:

(a) be based on up-to-date, measured, traceable operational data on energy consumption and (for electricity) load profiles;

(b) comprise a detailed review of the energy consumption profile of buildings or groups of buildings, industrial operations or installations, including transportation;

(c) identify energy efficiency measures to decrease energy consumption;

(d) identify the potential for cost-effective use or production of renewable energy;

(e) build, whenever possible, on life-cycle cost analysis instead of simple payback periods in order to take account of long-term savings, residual values of long-term investments and discount rates;

(f) be proportionate, and sufficiently representative to permit the drawing of a reliable picture of overall energy performance and the reliable identification of the most significant opportunities for improvement.

Energy audits shall allow detailed and validated calculations for the proposed measures so as to provide clear information on potential savings.

The data used in energy audits shall be storable for historical analysis and tracking performance.

Links with SRI and easySRI findings

It is obvious that there are similarities in terms of content and process between the SRI assessment and the energy audit. The dissemination activities of easySRI could address the need to align the qualification requirements for SRI assessors with those for energy auditors accredited for the buildings sector. There is also a link with the digital building logbook in terms of the storage of historical data and tracking performance. In terms of tracking performance there is the link with BACS and thus the SRI.

3.9 National Energy and Climate Plan

The National Energy and Climate Plans are drawn up on the basis of the Governance Regulation. [7] Part A of the plan consists of policies and measures that serve to achieve the defined targets. Evidence is provided in Part B of the plan, which uses simulations to show that the targets can actually be achieved with the policies and measures described in Part A.

The NECP follows a detailed table of contents that is stipulated by the Governance Regulation. It requires to list all the policies and measures that are to be implemented as a result of the transposition of the EED, the EPBD and the RED (as described in the previous chapters). The inclusion of the policies and measures in the NECP is important because reporting on the implementation status of the NECP must also be carried out and thus a control is given which is often not the case for the individual policy and measure.

Links with SRI and easySRI findings

The application of the easySRI platform to improve building performance in various respect, relating to the EPBD, the EED and the RED, could be included as a measure in the NECP.

3.10 Proof of conformity with Taxonomy requirements

The relevant chapter of Annex I to the Delegated Regulation Regulation (EU) 2021/2139 of 4 June 2021 [13, 13] is chapter 7 Construction and real estate activities, consisting of 7 subchapters of which **7.1. Construction of new buildings** and **7.2. Renovation of existing buildings** are irrelevant to easySRI. The other subchapters apply to the smart readiness of buildings, and the relevant text is presented below.

The technical screening criteria are:

(1) Substantial contribution to climate change mitigation

Do no significant harm ('DNSH')

(2) Climate change adaptation

(3) Sustainable use and protection of water and marine resources

(4) Transition to a circular economy

(5) Pollution prevention and control

(6) Protection and restoration of biodiversity and ecosystems

For **the relevant chapters 7.3 to 7.7 (detailed explanations see the paragraphs below)**, the positive contribution to criterion 1 is given by the measure per se. Regarding the assessment of Do Not Significant Harm (DNSH), the criteria 2 to 6 are not applicable. Regarding criterion 2, there is the reference to Appendix A to the Annex.

This Appendix contains in Section I Generic criteria for DNSH to climate change adaptation, and in Section II a table showing the Classification of climate-related hazards. The list of climate-related hazards in this table is non-exhaustive and constitutes only an indicative list of most widespread hazards that are to be taken into account as a minimum in the climate risk and vulnerability assessment.

For the topics presented below, this means that installation of systems must be done in a way that natural hazards would not affect them, for example:

- Placing batteries in rooms without risk of flooding
- Mounting PV modules on the roof in a way that reduces the risk of damage due to storm
- Solutions for external window blinds that can cope with storms and hail.

7.3. Installation, maintenance and repair of energy efficiency equipment

Description of the activity: Individual renovation measures consisting in installation, maintenance or repair of energy efficiency equipment.

The activity consists in one of the following individual measures provided that they comply with minimum requirements set for individual components and systems in the applicable national measures implementing Directive 2010/31/EU and, where applicable, are rated in the highest two populated classes of energy efficiency in accordance with Regulation (EU) 2017/1369 and delegated acts adopted under that Regulation:

[...]

(d) installation and replacement of energy efficient light sources;

(e) installation, replacement, maintenance and repair of heating, ventilation and air-conditioning (HVAC) and water heating systems, including equipment related to district heating services, with highly efficient technologies;

(f) installation of low water and energy using kitchen and sanitary water fittings which comply with technical specifications set out in Appendix E to this Annex and, in case of shower solutions, mixer showers, shower outlets and taps, have a max water flow of 6 L/min or less attested by an existing label in the Union market.

7.4. Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)

Description of the activity: Installation, maintenance and repair of charging stations for electric vehicles in buildings and parking spaces attached to buildings.

7.5. Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings

Description of the activity: Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings

The activity consists in one of the following individual measures:

(a) installation, maintenance and repair of zoned thermostats, smart thermostat systems and sensing equipment, including motion and day light control;

(b) installation, maintenance and repair of building automation and control systems, building energy management systems (BEMS), lighting control systems and energy management systems (EMS);

(c) installation, maintenance and repair of smart meters for gas, heat, cool and electricity;

(d) installation, maintenance and repair of façade and roofing elements with a solar shading or solar control function, including those that support the growing of vegetation.

7.6. Installation, maintenance and repair of renewable energy technologies

Description of the activity: Installation, maintenance and repair of renewable energy technologies, on-site.

The activity consists in one of the following individual measures, if installed on-site as technical building systems:

- (a) installation, maintenance and repair of solar photovoltaic systems and the ancillary technical equipment;*
- (b) installation, maintenance and repair of solar hot water panels and the ancillary technical equipment;*
- (c) installation, maintenance, repair and upgrade of heat pumps contributing to the targets for renewable energy in heat and cool in accordance with Directive (EU) 2018/2001 and the ancillary technical equipment;*
- (d) installation, maintenance and repair of wind turbines and the ancillary technical equipment;*
- (e) installation, maintenance and repair of solar transpired collectors and the ancillary technical equipment;*
- (f) installation, maintenance and repair of thermal or electric energy storage units and the ancillary technical equipment;*
- (g) installation, maintenance and repair of high efficiency micro CHP (combined heat and power) plant;*
- (h) installation, maintenance and repair of heat exchanger/recovery systems.*

7.7. Acquisition and ownership of buildings

Description of the activity: Buying real estate and exercising ownership of that real estate.

[...] Where the building is a large non-residential building (with an effective rated output for heating systems, systems for combined space heating and ventilation, air-conditioning systems or systems for combined air-conditioning and ventilation of over 290 kW) it is efficiently operated through energy performance monitoring and assessment. (This can be demonstrated, for example, through the presence of an Energy Performance Contract or a building automation and control system in accordance with Article 14 (4) and Article 15 (4), of Directive 2010/31/EU.)

Links with SRI and easySRI findings

With regard to the Taxonomy Regulation, evidence is required that could be provided using the easySRI platform. The points listed in the Annex sections 7.3 to 7.7 as explained in the previous chapter are already covered directly or indirectly in the SRI service catalogue.

In addition, the upcoming recast EPBD [3] states on Technical Building Systems (extract):

Member States shall lay down requirements to ensure that, where technically and economically feasible, non-residential buildings are equipped with building automation and control systems, as follows:

by 31 December 2024, non-residential buildings with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation of over 290 kW;

by 31 December 2029, non-residential buildings with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation systems of over 70 kW.

Also in this respect, evidence could be created by means of the SRI platform. However, in the upcoming EPBD recast, the obligation is weak due to the limitation “where technically and economically feasible”. Therefore, the link to the Taxonomy Regulation might be even more effective than the link to the upcoming EPBD recast.

3.11 ESG Reporting according to ESRS

The Accounting Directive [14] amended by the CSRD obliges companies to report both on their impacts on people and the environment, and on how social and environmental issues create financial risks and opportunities for the company.

Reporting is done according to European Sustainability Reporting Standards (ESRS) as shown in the table below and as specified by a Delegated Regulation [15] as part of the CSRD. ESRS 1 (“General Requirements”) sets general principles to be applied when reporting according to ESRS. ESRS 2 (“General Disclosures”) specifies essential information to be disclosed irrespective of which sustainability matter is being considered and is thus mandatory for all companies under the CSRD scope.

All the other standards are subject to a materiality assessment, meaning that the company will report only relevant information and may omit the information in question that is not relevant (“material”) for its business model and activity. Disclosure requirements subject to materiality are not voluntary.

The information in question must be disclosed if it is material, and the undertaking's materiality assessment process is subject to external assurance in accordance with the provisions of the Accounting Directive. [16]

Table 4. Overview of European Sustainability Reporting Standards (ESRS).

Group	Number	Subject	Relevance for the real estate sector (purchasing and owning buildings)
Cross-cutting	ESRS 1	General Requirements	Yes
Cross-cutting	ESRS 2	General Disclosures	Yes
Environment	ESRS E1	Climate	Yes (Building operation)
Environment	ESRS E2	Pollution	No
Environment	ESRS E3	Water and marine resources	No
Environment	ESRS E4	Biodiversity and ecosystems	No
Environment	ESRS E5	Resource use and circular economy	Yes (building renovation)
Social	ESRS S1	Own workforce	Yes
Social	ESRS S2	Workers in the value chain	No
Social	ESRS S3	Affected communities	No
Social	ESRS S4	Consumers and end users	Yes (building users)
Governance	ESRS G1	Business conduct	Yes

Legend: ESRS relevant for easySRI in green font

Links with SRI and easySRI findings

Sustainability reporting in accordance with CSRD is closely linked to the requirements of the Taxonomy Regulation. Financial institutions require proof of compliance as a prerequisite for granting financing or at least as a prerequisite for better financing conditions for the customer.

Companies complain about the large number of certificates that are required in different contexts and the associated expenses for consultancy services. If the certificates generated with easySRI were also suitable as evidence for ESRS E1, E5 and S4, companies would have a clear advantage from using the easySRI services.

3.12 Proof of conformity with Level(s) requirements

The six macro-objectives and associated indicators of Level(s) are shown in Table 5. The calculation of each indicator is described in a separate guideline as part of the online manual. [17]

Table 5. Overview of Level(s) macro-objectives and indicators with a focus on those relevant for easySRI.

Level(s) Macro-objectives (assessment categories)	Indicators (relevant to easySRI in green font)	Short description
1. Greenhouse gas emissions along a buildings life cycle	1.1 Use stage energy performance (kWh/m2/yr) 1.2 Life cycle Global Warming Potential (CO2 eq./m2/yr)	Based on EPC and associated CEN standards or national energy performance calculation method according to EPBD Annex
2. Resource efficient and circular material life cycles	2.1 Bill of quantities, materials and lifespans	Not applicable

	2.2 Construction & Demolition waste and materials 2.3 Design for adaptability and renovation 2.4 Design for deconstruction, reuse and recycling	
3. Efficient use of water resources	3.1 Use stage water consumption (m ³ /occupant/yr)	Not applicable
4. Healthy and comfortable spaces	4.1 Indoor air quality 4.2 Time outside of thermal comfort range 4.3 Lighting and visual comfort 4.4 Acoustics and protection against noise	Possible synergies with easySRI data collection for developing the indicators Noise protection is relevant because of potential noise issues due to heat pumps
5. Adaption and resilience to climate change	5.1 Protection of occupier health and thermal comfort 5.2 Increased risk of extreme weather 5.3 Sustainable drainage	Possible synergies with easySRI data collection for developing the indicators
6. Optimised life cycle cost and value	6.1 Life cycle costs (€/m ² /yr) 6.2 Value creation and risk factors	Possible synergies with easySRI Wizard; attention needs to be paid to methodological aspects

Links with SRI and easySRI findings

Data is necessary for calculating Level(s) indicators. It could be an additional benefit for building owners, if data collection for the SRI assessment is as much as possible aligned with the data collection carried out as part of a Level(s) assessment.

3.13 SME digitalization – Training

Small companies and micro-enterprises in particular need support with further training in the area of digitalisation. In the building sector, this primarily concerns the topic of building information modelling and everything associated with it.

Links with SRI and easySRI findings

The easySRI platform is designed for intuitive operation. The connection to BIM tools is supported. The easySRI platform could be integrated in trainings on BIM which are offered as part of publicly funded activities.

3.14 SME digitalization – Funding

Funding programmes for small and micro enterprises are necessary to support them in the digital transformation. Energy consultants and energy auditors in particular are often self-employed or work for an SME or micro-enterprise. Software tools are expensive and there are compatibility issues when different professions work together. Affordable solutions are needed, both in terms of the cost of the software and the time required to use it.

Links with SRI and easySRI findings

The easySRI platform could be designed in a way to enable affordable solutions as described above.

4 Analyzing relevant elements of EU initiatives

4.1 EU projects in the field of SRI and EPC

4.1.1 Smarter EPC

Duration: October 2023 - September 2026

Purpose: The [Smarter EPC](#) project aims to develop and deliver an open platform which will include a total of 7 different tools for issuing EPCs and SRI, with the aim of bringing stakeholders closer to recently developed or to be developed tools by research programs of the NextGenEPC network as well as the 2021-CET-SMARTREADY Life call. The Smarter EPC platform will allow **full access to the EPC tools developed under D2EPC, SmartLivingEPC and UCERT, as well as to the SRI tools to be delivered under Smart², easySRI, SRI2Market and UCERT**. The platform will enable the smart introduction of building related data, as well as the selection of the tool that will be used to issue EPC and SRI. Among others, the project envisages the issue of common EPC and SRI certificates, and the development of common building inspection procedures for the export of EPC and SRI certificates through the **adaptation of existing European standards**.

4.1.2 iEPB

Duration: October 2023 - September 2026

Purpose: The [iEPB](#) project aims to improve the energy performance of the EU's building stock by enhancing synchronization among existing Energy Performance Certifications (EPC) and other instruments. This involves aligning existing EPCs with complementary tools like the Smart Readiness Indicator (SRI) and energy renovation recommendations. The integration relies on the **development of a shared data model for EPB (Energy Performance Building) Assessments, which holds the potential for future expansion to incorporate additional assessments**.

4.1.3 SRI2market

Duration: November 2022 - October 2025

Purpose: The aim of [SRI2market](#) is **to roll-out SRI throughout Europe** by utilising the experience of countries that are already well advanced in the introduction of SRI to support and inspire those that are not yet at that stage. An assessment tool is developed which is accessible via registration.

4.1.4 Smart Square

Duration: October 2022 - September 2025

Purpose: [Smart Square](#) aspires to deliver a cloud based open platform for assessing the intelligence of buildings, considering as well the specificities of the Member States, with a view to maximize synergies with other EU initiatives. An SRI information hub and training centre is established. As part of the project, CEN and CENELEC organised the kick-off meeting on 4 March 2024 to create **consensus-based guidelines with recommendations for implementation of SRI building audits. The process is based on EN 16247 standards representing Europe's best practices in energy audits of buildings**. This series of standards is very useful as SRI audit shares a lot of common characteristics with the energy audits. The objective is to adopt the audit procedures described in the EN 16247:2022 energy audit standard, with the aim to deliver a novel SRI audit procedure.

Useful links:

- [SRI Observatory](#)
- [SRI Transposition tracker](#)

4.1.5 SRI-ENACT

Duration: December 2022 - May 2025

Purpose: [SRI-ENACT](#) aims to engage stakeholders at national and EU level to co-create tools and services for the Smart Readiness Indicator (SRI) uptake. Group training seminars and a series of webinars will be organised so that interested individuals can become SRI auditors. An **online registry of SRI auditors** will be created in each partner country that will support the implementation of SRI assessments.

4.1.6 tunES

Duration: September 2023 - August 2025

Purpose: The [tunES](#) project aims to optimise Energy Performance Certificate (EPC) regulation and integrate it with the Smart Readiness Indicator (SRI) roll-out in 7 national Energy Agencies, representing 132 million citizens. The agencies will follow the **EU Better Regulation Guideline (BRG) to identify and assess the best policy measures**.

4.2 EU projects and initiatives in the field of Building logbook

4.2.1 DBL Technical Guidelines

The [Technical Guidelines](#) were developed **based on an initiative of DG GROW** and were presented on 26 September 2023. The [workshop report](#) is also available.

4.2.2 openDBL

Duration: January 2023 - December 2025

Purpose: The [openDLB](#) project creates a data model and further develops an existing platform to create a DBL for an Italian Public Contracting Authority. **openDBL supports data matching with external databases** and integrates state-of-the-art technologies (AI, Blockchain, IoT and VR).

4.2.3 Demo-blog

Duration: January 2023 - December 2026

Purpose: The [Demo-blog project](#) brings together five different DBLs with a total of 4.5 million registered units. It is demonstrated how the DBLs facilitate transparency, trust, informed decision-making and **information sharing** within the construction sector, among building owners and occupants, and in financial institutions and public authorities. The idea is to collect data over the lifespan of a building and to create a common digital data repository to ensure efficiency in designing, constructing, operating and financing buildings.

4.2.4 Buildchain

Duration: January 2023 - December 2025

Purpose: The [Buildchain](#) project aims to design and develop its own Digital Building Logbook solution for the integration of building data and knowledge, and the inclusion of new applications and functionalities dealing with integrated information, efficiency, circularity and transparency to improve the building stock, facilitate informed decision making and its validation. The project creates a **new tokenized economy around Digital Building Logbooks (DBLs)**.

4.3 Links with SRI and easySRI findings

Several initiatives have been identified that have potential synergies with easySRI. These links are listed in Table 6 below and will be explored later in the project to see if they are worth pursuing.

Table 6. Overview of links between easySRI and other initiatives.

Project / Initiative	Identified link	Possible link with easySRI
Smarter EPC	Adaptation of existing European standards	Consider in easySRI Task 6.4 on Standardisation
iEPB	Shared data model for EPB to be extended to incorporate additional assessments	Consider in easySRI data model
SRI2market	SRI Roll-out throughout Europe	Not to duplicate tools but to complement each other, and to benefit from roll-out
Smart Square	EN 16247:2022 energy audit standard, with the aim to deliver a novel SRI audit procedure	Consider in easySRI Task 6.4 on Standardisation
SRI-ENACT	Online registry of SRI auditors	Connect easySRI platform with this registry
tunES	EU Better Regulation Guideline (BRG)	Observe the project development and check if input can be used
DG GROW	DBL Technical Guidelines	Make sure that easySRI services are in line with the DBL Technical Guidelines
openDBL	DBL data matching with external databases	Make sure that easySRI platform is capable of data sharing with openDBL approaches
Demo-blog	DBL information sharing	Make sure that easySRI platform is capable of data sharing with closed DBL approaches
Buildchain	DBL tokenized economy	Maybe an approach towards business models easySRI can learn from

5 Approaches, areas and responsible stakeholders for introducing SRI

5.1 Approaches for introducing SRI

SRI related indicators are relevant in various areas as shown below. Introduction of such indicators can be voluntary in the form of guidelines, quasi-mandatory if there is a link to funding, and mandatory if there is a legal obligation.

Mandatory requirements must be complemented by penalties imposed in case of non-compliance. Such procedures create administrative burdens and are expensive. Therefore, a basic level of social acceptance is necessary for the successful introduction of new obligations. Often, voluntary programmes pave the way for the introduction of mandatory obligations, and many times (but not always, as in the case of green building rating systems) they are supported by incentives.

The development of the EPC based on the Energy Performance of Building Directive (EPBD) shows that the introduction of new obligations is initially voluntary and/or less demanding. In a second and third step, after sufficient time for all market actors to adapt to the new conditions, the obligations are made binding and/or the requirements are tightened (see the evolution of Directive 2002/91/EC, Directive 2010/31/EU, Directive (EU) 2018/844, and the Commission proposal for EPBD recast 2021).

In Europe, voluntary green building rating systems have been used since the late 1990s. Based on the already available experience, DG Environment developed the so-called Level(s) scheme which borrows from the voluntary green building assessment schemes but is the European Commission's official green building assessment scheme.

It was voluntary, but recently in 2020 became de facto mandatory with the EU Taxonomy Regulation (EU) 2020/852 which refers to Level(s) indicators in the context of classifying an investment as sustainable or unsustainable. The Taxonomy Regulation has become the main driving force behind the increasing demand for sustainable buildings (including energy efficiency).

Thus, relevant areas can be structured along the following categories:

- Voluntary introduction of smart readiness indicators
- Quasi-mandatory introduction of smart readiness indicators
- Mandatory introduction of smart readiness indicators

5.2 Areas by type of approach for introducing SRI

5.2.1 Areas and stakeholders for voluntary introduction of SRI

The areas listed below can be addressed through the associations at EU level and at national level and through innovative front runner companies:

- **Real Estate and Property Development:** SRI is highly relevant in the real estate sector because it assesses the readiness of buildings and properties to incorporate smart technologies. Property developers and real estate investors can use SRI to evaluate the smart capabilities of their assets, making them more attractive to tenants and buyers.
- **Construction and Architecture:** Architects, construction companies, and building designers can use SRI to plan and construct smart, energy-efficient buildings. SRI can guide decisions related to the integration of smart systems and energy-efficient technologies during the design and construction phases.
- **Facility and Energy Management:** Facility managers can utilize SRI to assess and improve the smart readiness of existing buildings. This can involve upgrading HVAC systems, lighting, security, and automation technologies to enhance energy efficiency, comfort, and security.

- **Smart Home Technology:** Companies involved in smart home technology and IoT devices can benefit from SRI by aligning their products with the indicators. This helps consumers and businesses understand the compatibility and interoperability of smart devices in their homes and offices.
- **Smart Cities and Urban Planning:** In the context of smart city initiatives, SRI can be applied to assess the readiness of urban areas and infrastructure for smart technologies. Urban planners can use this data to guide infrastructure development.
- **Providers of rating systems for assessing the sustainability of buildings:** These types of ratings are in demand for a variety of reasons, such as sustainable real estate funds. There are now several rating procedures that require building data. Building data should be made easily accessible and multiple and thus often duplicated data collection should be avoided.
- **EPC issuers:** EPC issuers can offer the SRI assessment as additional service to be carried out during the EPC issuing process.
- **Energy auditors:** Energy auditors can offer the SRI assessment as additional service to be carried out during the auditing process.
- **Educational institutions:** Aspects of smart readiness of buildings need to be integrated into various educational programs.
- **Research and development:** Companies involved in the development of smart technologies, sensors, and IoT devices can use SRI as a benchmark to understand the market's demand for smart and connected solutions.

5.2.2 Areas and stakeholders for quasi-mandatory introduction of SRI

The areas listed below can be addressed through the associations at EU level and at national level and through innovative front runner companies:

- **Energy Management and Utilities:** Utility companies and energy management service providers can use SRI to identify opportunities for reducing energy consumption in buildings as well as grid flexibility services. This can be reflected in the fee structure or tariff.
- **Insurance and Risk Assessment:** Insurance companies may consider SRI data when underwriting policies for buildings. Buildings with higher smart readiness scores may be seen as lower risks due to enhanced safety and security measures.
- **Financing Institutions:** Smart readiness has implications in several areas that can play a role in sustainable finance. ESG reporting and the requirements of the Taxonomy Regulation need to be examined in more detail in this regard (see chapter 3).

6 National priorities for incorporating SRI into policies and initiatives: Austria

6.1 Current status

Austria participates in the SRI national test phase led by OIB. Several meetings took place under the lead of OIB (Österreichisches Institut für Bautechnik – Austrian Institute of Construction Engineering) during the years 2023 and 2024 where SERA participated, representing the easy SRI project. On 11 October 2023, a stakeholder workshop was organized under the lead of OIB, resulting in the outcome that “grid flexibility” is considered very important in the Austrian context. However, it must also be noted that the electricity sector had been invited but was hardly represented at the workshop. This leads to the following observations regarding the electricity sector as an important player in the adoption of SRI: there might be a lack of knowledge regarding the potential of SRI, the potential of SRI might be considered irrelevant because there is only qualitative information, too little importance might be attached to SRI, changing processes might be seen as too burdensome.

6.2 Results of case study

National priorities for incorporating smart readiness are investigated in more detail at two levels:

- Incorporating smart readiness into the legal framework
- Incorporating smart readiness into voluntary approaches

The following procedure is applied:

- Review existing national and regional regulations and policies related to building standards, energy efficiency, renewable energy, indoor air quality and health, and smart technologies; including identification of jurisdiction and relevant contacts at national level, analysis what works well and why and where are barriers and why. Important are voluntary building assessment schemes such as DGNB and specific national schemes which are also used for the public building stock and for funding programs.
- Identify gaps or areas where new policies or updates are needed to facilitate smart readiness.
- Identify key stakeholders in the relevant government agencies to discuss possible ways forward with them.

It is clear that the information on ongoing developments is informal.

6.2.1 Review of existing national and regional regulations and policies

The review of existing national and regional regulations and policies is presented along the following topics:

- Building standards
- Energy efficiency and renewable energy
- Thermal comfort
- Indoor-air quality
- Smart technologies: Building Automation and Control Systems
- Smart technologies: Storage / Grid Flexibility

Building standards

The table below is not a complete list but shows an extract of building standards which are considered relevant in the context of the project.

Table 7. Building related standards in relevant fields.

Field	Austrian Standards and international standards where applicable
Energy efficiency	ÖNORM B 8110-5 on Basic data: Climate model and user profiles

EPC calculation	<p>ÖNORM B 8110-6-1 on Useful energy: Heating and cooling demand</p> <p>ÖNORM H 5057-1 on Useful energy: Ventilation and air conditioning energy demand</p> <p>ÖNORM H 5050-1 on Final energy: Total energy efficiency factor and final energy requirements based on reference equipment and primary energy demand and carbon dioxide emissions</p> <p>ÖNORM H 5056-1 on Final energy: Heating energy demand and humidification energy demand</p> <p>ÖNORM H 5058-1 on Final energy: Cooling energy demand</p> <p>ÖNORM H 5059-1 on Final energy: Lighting energy demand</p>
Renewable energy PV planning and installation	<p>Electrotechnical standards for the planning, installation and testing of photovoltaic systems:</p> <p>OVE E 8101:2019-01-01 Low-voltage electrical installations</p> <p>OVE E 8101/AC1:2020-05-01 Low-voltage electrical installations (Corrigendum)</p> <p>OVE EN 62446-1:2019-05-01 Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance -- Part 1: Grid connected systems - Documentation, commissioning tests and inspection</p> <p>OVE guidelines for the planning and installation of photovoltaic systems:</p> <p>OVE-Richtlinie R 6-2-1:2012-04-01 Lightning and overvoltage protection -- Part 2-1: Photovoltaic power supply systems - Lightning and overvoltage protection</p> <p>OVE-Richtlinie R 6-2-2:2022-05-01 Lightning and overvoltage protection -- Part 2-2: Photovoltaic power supply systems - Selection and application principles of surge protection devices</p> <p>OVE-Richtlinie R 11-1:2022-05-01 PV systems - Additional safety requirements -- Part 1: Requirements for the protection of firefighters</p> <p>OVE-Richtlinie R 20:2016-11-01 Stationary electrical energy storage systems intended for fixed connection to the low voltage grid</p>
Indoor air quality and health as dealt with by the klimaaktiv building assessment scheme	<p>ÖNORM M 5700-2 Measurement of indoor air pollutants - Gas chromatographic determination of organic compounds - Part 2: Active sampling by preconcentration on activated carbon - Solvent extraction</p> <p>ISO 16000-6 Determination of organic compounds (VVOC, VOC, SVOC) in indoor and test chamber air by active sampling on sorbent tubes, thermal desorption and gas chromatography using MS or MS FID</p> <p>ISO 16000-3 Determination of formaldehyde and other carbonyl compounds in indoor and test chamber air</p>
Smart technologies	<p>ÖNORM EN ISO 52120-1, edition: 2022-09-15, Energy performance of buildings — Contribution of building automation, controls and building management Part 1: General framework and procedures</p> <p>ÖNORM EN ISO 16484-1, edition 2011-02-15, Building automation and control systems (BACS) Part 1: Project specification and implementation</p> <p>ÖNORM EN ISO 16484-2, edition 2016-08-01, Building automation and control systems (BACS) Part 2: Hardware</p> <p>ÖNORM EN ISO 16484-3, edition 2006-03-01, Building automation and control systems (BACS) Part 3: Functions</p> <p>ÖNORM EN ISO 16484-1, edition 2020-10-15, Building automation and control systems (BACS) Part 5: Data communication protocol</p> <p>ÖNORM EN ISO 16484-6, edition 2020-10-15, Building automation and control systems (BACS) Part 6: Data communication conformance testing</p>

Energy efficiency and renewable energy

The table below provides an overview of mandatory and voluntary policy instruments at national and regional levels covering energy efficiency and renewable energy in buildings.

Table 8. Energy efficiency and renewable energy: policy instruments at national and regional level.

Mandatory	Voluntary	Responsible institution	What works well	Barriers if existent
Regional				
Building regulation		Building authority at municipal level	Control of minimum requirements	
Independent control system		Authority at regional level	Based on EPC database environment	
	Housing subsidy scheme	Authority at regional level		Not used if many and ambitious requirements
National				
Building requirements		OIB Association of the Provinces with Coordination role		
	Financing scheme for public buildings	Kommunalkredit (public sector financing bank)		Not used if financing scheme too complicated

Legend: Green: only for residential buildings; Blue: only for non-residential buildings

Thermal comfort

Information about thermal comfort can be gained from the EPC. Requirements exist only for non-residential buildings as part of the employment legislation which specifies the conditions a workplace must meet. Thermal comfort is only specified in terms of room temperature in winter and summer, and not in terms of air movement (ventilation systems, air tightness) and surface temperature of walls.

Thermal comfort is addressed by the voluntary building assessment scheme klimaaktiv Gebäudestandard which has become part of the provincial housing subsidy schemes and of other voluntary building assessment schemes used in Austria (see also below regarding indoor-air quality).

Indoor-air quality

Harmful building materials are forbidden. There are no mandatory requirements regarding indoor-air quality but there is an official working group of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) that issues the [Guidelines on Indoor air Quality](#). Position papers and guidelines of the indoor air working group reflect the professional opinion of the experts (environmental hygiene, measurement technology) represented in the working group on a current problem of the indoor air topic. They do not have a normative character and can also be reworked after an evaluation.

There are voluntary building assessment systems such as the Austrian klimaaktiv Gebäudestandard which requires the measurement of indoor air quality regarding certain indicators such as formaldehyde. The strategy is to ensure indoor air quality by means of low-emission building materials.

This works well for new construction. In building operation, it is difficult because emissions come from furniture and the use of cleaning products which is the decision of the building user. The [klimaaktiv Gebäudestandard](#) is an initiative by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) and operated by ÖGUT.

Smart technologies: Building Automation and Control Systems

[Guidelines](#) are issued by consulting/quality assurance organisations such as TÜV Süd to inform potential clients.

Public bodies such as the City of Vienna issues guidelines for procurement: The [Building Automation Guide](#) is a supplementary set of rules to the room books for official buildings, schools and kindergartens as well as for other departments for which the Department of Building and Facility Management acts. It serves as a [binding basis for](#)

[planning and tendering](#) and is intended as a support for project preparation. It in no way replaces necessary meetings for detailed coordination with the departments concerned and the Department of Building and Facility Management.

Smart technologies: Storage / Grid Flexibility

The Smart Grids Austria Technology Platform brings together key players from the energy sector, industry and research and has established itself as a competent point of contact for the public sector since it was founded in 2008. In this way, it can make a significant contribution to shaping the framework conditions for R&D and the implementation of innovative technologies for the future energy system. Among others, the Smart Grids Austria Technology Platform develops and publishes [position papers](#) and factsheets, also about the role of storages in smart grid management.

6.2.2 Possibilities of incorporating smart readiness into voluntary building assessment approaches

Voluntary building assessment schemes such as DGNB and specific national schemes which are used for the public building stock and for funding programmes addressing the residential sector are important.

The klimaaktiv Gebäudestandard is most important because it is also part of funding programmes and other voluntary green building assessment schemes applied in Austria. klimaaktiv Basic Criteria are an extract from the overall set of criteria and comprise the minimum requirements for all building categories in new construction and refurbishment. The numbering of the Basic Criteria in this list and the respective brochure follows the numbering in the overall criteria set. This ensures that all detailed information can be found easily on the online declaration platform. [18]

Table 9. Overview of klimaaktiv Basis Criteria.

klimaaktiv Basis Criteria	Possible link to easySRI
A - Location A.1 Infrastructure A.2 Environmentally friendly mobility A.2.1 Public transport connection	
B - Energy and supply B.1.1 Heating demand B.1.2 Cooling demand (externally induced) (only applies to service buildings) B.1.3 Primary energy demand B.1.4 CO ₂ emissions B.3.2 Energy consumption monitoring from 1,000 m ² gross floor area (GFA) B.3.3 Airtight building envelope	Link to easySRI
C - Building materials and construction C.1.1 Exclusion of climate-damaging substances C.1.2 Exclusion of PVC for floor and wall coverings C.4.1 Eco-index of the building - OI3	
D - Comfort and indoor air quality D.1.1 Thermal comfort in summer (only applies to residential buildings) D.2.1 Indoor air quality D.2.3 Indoor air quality measurements: formaldehyde and VOC from 2,000 m ² GFA	Link to easySRI

If the link to the klimaaktiv Basis Criteria is not feasible, then the link with the klimaaktiv criteria catalogue for non-residential buildings could be targeted.

6.2.3 Identification of key stakeholders for discussion

The following table provides an overview of stakeholders to discuss with in Austria.

Table 10. Overview of organisations and topics

Organisation	Topics
OIB – Austrian Institute of Construction Engineering	How to connect easySRI findings to the Austrian SRI testphase
ÖGUT / klimaaktiv Gebäudestandard	Integrate grid flexibility and storage into criteria catalogue and assessment scheme
ÖGNI – Austrian association for the sustainable real estate sector	easySRI platform as a tool for producing documents of proof for ÖGNI/DGNB assessment
Smart grids Austria technology platform	easySRI potential contribution to position paper
Public bodies – procurement guidelines	easySRI potential contribution to procurement guidelines
Working group/Guidelines on Indoor air quality	easySRI potential contribution to Guidelines on Indoor air quality
Photovoltaics association Austria	easySRI potential services for member companies
ÖVI – Association of real estate companies	easySRI potential services for member companies
Association of non-profit property developers	easySRI potential services for member companies
BIG and ARE Bundesimmobiliengesellschaft - Federal Real Estate Company (non-residential buildings)	easySRI potential services
Österreichs Energie – Austrian umbrella organisation of energy supply companies	easySRI potential services for member companies

6.3 Conclusions

Regarding the identification of gaps or areas for new policies or updates to facilitate smart readiness the following conclusions are drawn as presented below.

There is no need for new policy instruments, but rather for an update of existing instruments. This applies above all to the klimaaktiv building standard, which forms a basis for further policy instruments and is in any case constantly being further developed in line with new requirements.

Other instruments that could be updated with SRI and easySRI findings:

- Guidelines on Indoor air quality issued by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
- Guidelines on smart technologies/BACS issued by consulting/quality assurance organizations such as TÜV Süd to inform potential clients
- Guidelines for procurement of BACS issued by the City of Vienna and other authorities
- Position papers and fact sheets issued by the Smart Grids Austria Technology Platform as the basis for shaping the framework conditions for R&D and the implementation of innovative technologies for the future energy system.

7 National priorities for incorporating SRI into policies and initiatives: Cyprus

7.1 Current status

As of now, Cyprus has yet to initiate the adaptation of the Smart Readiness Indicator (SRI) within its framework. The Smart Readiness Indicator, a key component of the EU's energy efficiency policies, assesses the capacity of buildings to use and interact with new technologies effectively. In Cyprus, the integration of SRI could significantly enhance the energy efficiency of buildings, promote sustainable development, and bolster the country's commitment to EU directives. The adaptation process in Cyprus would involve several crucial steps. Firstly, the government needs to establish a regulatory framework outlining the requirements and procedures for implementing the SRI. This includes defining the parameters for assessing smart readiness, such as building automation systems, energy management systems, and connectivity infrastructure. Furthermore, Cyprus must invest in education and training programs to familiarize stakeholders, including building owners, developers, and energy professionals, with the concept and application of SRI. Collaboration with industry experts and technology providers is essential to ensure the compatibility and effectiveness of smart technologies in Cyprus' diverse building landscape. Additionally, the government should consider offering incentives and subsidies to encourage the adoption of smart technologies in both new constructions and existing buildings. Public awareness campaigns highlighting the benefits of SRI implementation could also foster a culture of energy consciousness and sustainability among Cypriot citizens.

Overall, the adaptation of the Smart Readiness Indicator in Cyprus presents a significant opportunity to modernize the building sector, reduce energy consumption, and contribute to the country's environmental objectives.

7.2 Results of case study

7.2.1 Review of existing national and regional regulations and policies

Buildings play a significant role in Cyprus's energy landscape, accounting for a substantial 30% of total energy consumption. This proportion is expected to escalate as the building sector continues to expand. Consequently, the imperative to curtail energy usage and advocate for renewable energy sources within this sector becomes paramount. Such initiatives are pivotal not only for mitigating greenhouse gas emissions but also for fortifying the security of the nation's energy supply. To address these challenges, Cyprus has enacted the Energy Performance of Buildings Law, aligning with pertinent European Directives to institute a spectrum of measures geared towards enhancing the energy efficiency of both new constructions and existing structures.

These measures are meticulously tailored to account for various factors such as local climatic conditions, indoor climate considerations, and the cost-benefit analysis spanning the entirety of a building's lifecycle. They embody a multifaceted strategy aimed at fostering sustainability and resilience within the built environment.

Among the key measures outlined in this legislative framework are:

1. Establishment of Minimum Energy Performance Requirements: This entails setting stringent standards for energy performance across different building categories, encompassing new constructions, building units, extensively renovated structures, and components of building envelopes subject to retrospective installation or replacement.
2. Issuance of Energy Performance Certificates (EPCs): All new buildings and building units, along with those being leased or sold, are mandated to obtain EPCs. These certificates provide crucial insights into a building's energy efficiency, facilitating informed decision-making for both owners and occupants.
3. Promotion of Nearly Zero-Energy Buildings (nZEBs): Aiming to push the envelope further, Cyprus aspires for all new constructions completed by December 31, 2020, to attain nearly zero energy consumption, thus setting a high bar for energy efficiency standards.

4. Development of Long-Term Building Renovation Strategies: Recognizing the importance of continual improvement, Cyprus is actively formulating comprehensive strategies for the long-term renovation of buildings. These initiatives are vital for ensuring that existing structures are brought up to par with contemporary energy efficiency benchmarks.
5. Introduction of Regular Inspections: Heating and cooling systems, integral to a building's energy performance, undergo regular inspections to ensure optimal functionality and efficiency.
6. Implementation of Technical System Requirements: Stringent criteria are enforced concerning the dimensioning, installation, adjustment, and operation of technical systems in existing buildings. This ensures that upgrades or replacements contribute positively to overall energy efficiency goals.
7. Establishment of a Voluntary Smart Readiness Indicator (SRI) Assessment System: Recognizing the growing importance of smart technologies in building operations, Cyprus is laying the groundwork for a voluntary system to assess the smart readiness of buildings. This initiative aligns with emerging trends in the integration of digital solutions for enhanced energy management and performance optimization.

In sum, these measures encapsulate a holistic approach towards bolstering the energy efficiency of buildings in Cyprus. By aligning with broader sustainability and climate objectives, Cyprus is poised to lead by example in fostering a more resilient and environmentally responsible built environment. Through concerted efforts and ongoing collaboration among stakeholders, the nation can pave the way towards a more sustainable future.

7.2.1.1 Minimum Energy Performance Requirements

Buildings significantly contribute to long-term energy consumption due to their extended life cycle, highlighting the importance of implementing suitable measures for energy conservation and efficient energy use, both in new constructions and in renovated buildings. For this purpose, minimum energy performance requirements are applied in the following cases:

- In new buildings and building units.
- In buildings undergoing major renovations.
- In building envelope components being replaced or retrofitted.

The requirements for each building vary depending on which of the above cases they fall under and the type of the building.

The minimum energy performance requirements are determined by Decree issued by the Minister of Energy, Trade, and Industry. For the issuance of this decree, the Minister consults the statutory Advisory Committee for the Promotion of Energy Efficiency in Buildings and the Promotion of Nearly Zero-Energy Buildings. The review of minimum energy performance requirements must be conducted at least every five years to take into account technological and economic developments in the building and energy sectors. To ensure that the minimum energy performance requirements have a favorable cost-benefit ratio throughout the building's life cycle, the optimal cost-effective levels of minimum energy performance requirements are calculated at least every five years.

These measures aim to enhance energy efficiency, promote sustainable building practices, and contribute to the overall reduction of energy consumption and greenhouse gas emissions in the building sector.

7.2.1.2 Energy Performance Certificates

The Energy Performance Certificate (EPC) categorizes buildings into energy efficiency classes ranging from A to H, with Class A representing the highest energy performance. Additionally, the EPC provides information regarding estimated annual energy consumption, annual CO₂ emissions from energy use, and the contribution of renewable energy sources to meeting the building's energy needs. The building owner or unit owner is responsible for obtaining the EPC in the following cases:

- For newly constructed buildings.
- For buildings or units offered for sale and/or sold.
- For buildings or units offered for rent and/or leased to a new tenant.
- For buildings where the total useful area exceeds 250 m² and is used by a public authority frequently visited by the public. In this case, the EPC must be prominently displayed to the public.

During the construction, sale, or lease of a building or building unit, the EPC or a copy thereof must be presented to the prospective tenant or buyer and handed over upon purchase or lease. Additionally, the energy efficiency class of the building or building unit offered for sale or rent must be declared in all commercial advertisements.

The issuance of an EPC is not required in the following cases:

- Parts or entire industrial or commercial buildings or warehouses not using energy for regulating indoor climatic conditions and used purely for industrial, commercial, or storage purposes. Auxiliary spaces with a total useful area below 50 m², using energy for regulating indoor climatic conditions, which are part of the aforementioned buildings.
- Rural buildings uninhabited by humans with low energy requirements or used in sectors covered by a specific energy performance agreement.
- Individual buildings with a total useful area below 50 m².
- Buildings used as places of worship.

The EPC must always be accompanied by recommendations for improving the energy performance of the building or building unit. These recommendations should be technically feasible, consider the cost-benefit ratio, and cover measures that can be taken during major renovations or when replacing a building element. Thus, prospective buyers or tenants, as well as building owners and users, are provided with valuable information regarding the overall energy status of the building or building unit. Consequently, they are empowered to compare similar buildings and make informed decisions regarding purchase, lease, or improvement of their respective building or building unit.

According to Regulation 19(3/b) of the Regulations for Energy Performance of Buildings (Energy Certification of Buildings) of 2009 and 2014 (Law No. 164/2009 and Law No. 39/2014), inspection of the EPC registry section containing building energy performance certificates and recommendations can be carried out upon request by interested parties. Energy Performance Certificates are valid for ten years and are issued only by Qualified Energy Experts whose qualifications and obligations are determined by relevant Regulations. The Energy Service maintains a registry of all Qualified Energy Experts, part of which, containing their names and contact details, is available in the Building Energy Certification System.

The "Building Energy Performance Calculation Methodology" and the "Building Insulation Guide (2nd Edition)" define the methodology for calculating energy performance to be followed by all Qualified Energy Experts for issuing the EPC. The SBEMcy software program is provided free of charge by the Energy Service for calculating building energy performance and issuing EPCs.

7.2.1.3 Nearly Zero-Energy Buildings

A Nearly Zero-Energy Building (NZEB) refers to a building with very high energy performance, determined according to the methodology for calculating building energy performance, and where the nearly zero or very low amount of energy required is covered to a very large extent by energy from renewable sources, including on-site or nearby energy generation.

The requirements and technical characteristics of NZEBs were established by Decree issued by the Minister of Energy, Trade, and Industry in 2014. These requirements became mandatory for new buildings alongside the existing minimum energy performance requirements issued in 2020. Additionally, the requirements for NZEBs can be utilized by those wishing to renovate and upgrade an existing building to a very high level of energy performance.

These measures aim to promote sustainable building practices, reduce reliance on non-renewable energy sources, and contribute to overall energy efficiency in the built environment.

7.2.1.4 Long-Term Renovation Strategy for Buildings

The Long-Term Renovation Strategy for Buildings highlights, through quantitative and qualitative indicators, the problems stemming from the energy performance of the existing building stock today, as well as the opportunities offered by increased investment mobilization in the field of radical renovations. The involved parties, the existing obstacles, and how these obstacles can be overcome are identified. Based on the above data, a roadmap is presented with measurable progress indicators until 2050. The aim is to facilitate the economically efficient transformation of existing buildings into Nearly Zero-Energy Buildings.

The Long-Term Renovation Strategy of each member state is submitted to the Commission as part of the final consolidated National Energy and Climate Plan. This strategy aims to address energy efficiency, sustainability, and climate change goals by incentivizing and guiding the renovation of existing buildings towards significantly lower energy consumption levels.

7.2.1.5 Inspections of Heating and Cooling Systems

The aim of inspecting heating and cooling systems is to improve the energy efficiency of the systems through the proposals submitted by the inspector.

Heating and cooling systems with a useful nominal capacity greater than 70 kW must be inspected every five years. Inspections may not be required if an automation and control system has been installed, or if the system is covered by an energy performance contract or an agreed energy performance criterion, or if the operation of the system has been assigned to an operator or network manager. Optionally, systems with a capacity of less than 70 kW may also be inspected. The inspection process for heating and cooling systems is defined in the "Heating and Cooling Systems Inspection Guide" issued by the Energy Service.

Inspections of cooling systems are conducted by cooling system inspectors, while inspections of heating systems are conducted by heating system inspectors. In any case, the inspector delivers an inspection report to the building owner, documenting the inspector's proposals for improving the performance of the system or parts thereof.

7.2.1.6 Requirements, Regulation, and Inspection of Building Technical Systems

To further improve the energy efficiency of heating and cooling systems in existing buildings, periodic inspection, regulation, and operation of these systems have been legislated. Two guides have been issued for each system, describing the tasks and checks to be carried out by technical system installers. The aim is to ensure that appropriate maintenance measures are taken for heating and cooling systems to operate with the best possible energy efficiency.

Additionally, for new systems installed in existing buildings and for existing systems undergoing upgrades, energy efficiency requirements have been established. These requirements cover not only heating and cooling systems but also hot water production systems, large ventilation systems, lighting, automation and control systems, and on-site electricity generation systems. The application of these requirements is mandatory to the extent that it is technically, operationally, and economically feasible.

The Energy Service has created a registry of installers with the aim of ensuring minimum quality levels regarding the installation of systems and their energy performance. Gradually, ensuring quality is expected to increase the confidence of building owners in the technical personnel working in the field of technical systems and small-scale renewable energy systems.

7.2.2 Identification of key stakeholders for discussion

In Cyprus, the main stakeholders involved in the implementation and assessment of Smart Readiness Indicators (SRI) for buildings may include:

1. **Government Institutions:** Government bodies at various levels (national, regional, and local) play a crucial role in developing and implementing policies related to energy efficiency and building standards. This includes the Ministry of Energy, Commerce, and Industry, as well as local municipalities responsible for building regulations.
2. **Energy Regulatory Authority:** The Energy Regulatory Authority of Cyprus (CERA) oversees energy-related policies and regulations and may be involved in implementing SRI requirements.
3. **Building Owners and Developers:** Building owners, developers, and facility managers have a vested interest in ensuring that their properties meet SRI standards. They may need to invest in upgrades or technologies to improve the smart readiness of their buildings.
4. **Architects and Engineers:** Design professionals are responsible for incorporating smart technologies and energy-efficient design principles into building plans and construction projects. They play a key role in ensuring that buildings meet SRI requirements from the outset.

5. **Construction Industry:** Construction companies and contractors are responsible for implementing building designs and integrating smart technologies into the construction process. They need to ensure that the final product meets SRI criteria.
6. **Energy Service Companies (ESCOs):** ESCOs provide energy efficiency services, including the installation of smart technologies and systems in buildings. They may be involved in retrofitting existing buildings to improve their smart readiness.
7. **Technology Providers:** Companies that develop and supply smart building technologies, such as sensors, automation systems, and energy management software, play a critical role in implementing SRI requirements.
8. **Research Institutions and Academia:** Universities and research institutions contribute to the development of SRI standards and guidelines through research and innovation. They may also provide training and education on smart building technologies.
9. **Industry Associations and Professional Organizations:** Associations representing the construction, real estate, and energy sectors may advocate for SRI adoption and provide guidance and support to their members.
10. **Consumers and Tenants:** Building occupants have a growing interest in smart and energy-efficient buildings due to the potential benefits in terms of comfort, cost savings, and environmental impact. Their feedback and preferences can influence the adoption of SRI standards.

Table 11. Overview of stakeholders in Cyprus.

Stakeholder	Description	Specific Interest
Government Institutions	Government bodies responsible for developing and implementing energy efficiency policies and building regulations at various levels.	Ensure compliance with SRI standards and promote energy efficiency
Energy Regulatory Authority	Regulatory body overseeing energy-related policies and regulations, ensuring compliance with energy efficiency standards and promoting the adoption of smart technologies.	Implementing SRI requirements and fostering energy efficiency
Building Owners and Developers	Individuals or organizations owning or developing buildings, responsible for ensuring that properties meet SRI standards and may need to invest in upgrades or technologies.	Meeting SRI requirements and improving building value
Architects and Engineers	Design professionals responsible for incorporating smart technologies and energy-efficient design principles into building plans and construction projects.	Ensuring buildings meet SRI criteria from the outset
Construction Industry	Companies and contractors responsible for implementing building designs and integrating smart technologies into the construction process.	Ensuring final buildings meet SRI criteria
Energy Service Companies	Providers of energy efficiency services, including the installation of smart technologies and systems in buildings.	Retrofitting existing buildings to improve smart readiness
Technology Providers	Companies developing and supplying smart building technologies, such as sensors, automation systems, and energy management software.	Advancing smart technology and meeting SRI requirements
Research Institutions	Universities and research institutions contributing to the development of SRI standards and guidelines through research and innovation.	Advancing knowledge and innovation in smart building technologies
Industry Associations	Associations representing the construction, real estate, and energy sectors, advocating for SRI adoption and providing guidance and support to their members.	Promoting SRI adoption and supporting members' interests
Consumers and Tenants	Building occupants with an interest in smart and energy-efficient buildings due to potential benefits in comfort, cost savings, and environmental impact.	Enjoying benefits of smart buildings and influencing adoption

7.3 Conclusions

Cyprus is enhancing the energy efficiency of its buildings and integrating smart technologies to meet European Union directives. Although the country has yet to formally implement the Smart Readiness Indicator (SRI), a framework designed to assess buildings' capability to utilize and interact with new technologies, it recognizes the potential benefits of doing so. The adaptation of SRI in Cyprus is anticipated to not only modernize the building sector but also significantly reduce energy consumption and support the country's environmental goals.

The importance of this initiative is underscored by the fact that buildings in Cyprus account for a substantial 30% of total energy consumption, a figure expected to rise with the sector's growth. In response, Cyprus has introduced the Energy Performance of Buildings Law, aligning with European Directives to enhance the energy efficiency of both new and existing buildings. This comprehensive approach includes setting minimum energy performance requirements, issuing Energy Performance Certificates (EPCs), promoting Nearly Zero-Energy Buildings (nZEBs), developing long-term renovation strategies, and enforcing regular inspections of heating and cooling systems. The establishment of minimum energy performance requirements is a cornerstone of Cyprus's strategy, targeting new buildings, major renovations, and retrofitting projects. These standards are periodically reviewed to reflect technological advances and economic considerations, ensuring that energy efficiency measures are both effective and cost-beneficial over a building's lifecycle. Furthermore, the introduction of Energy Performance Certificates provides transparency regarding a building's energy efficiency, encouraging informed decisions among owners and occupants. The push towards Nearly Zero-Energy Buildings (nZEBs) is particularly ambitious, with Cyprus setting stringent requirements for new constructions to achieve very high energy performance, predominantly through renewable energy sources. This initiative is complemented by the development of long-term renovation strategies aimed at upgrading existing buildings to meet similar high standards of energy efficiency. The inspection of heating and cooling systems forms another critical aspect of Cyprus's energy efficiency framework, ensuring that these systems operate optimally to conserve energy. Additionally, Cyprus has legislated the periodic inspection and regulation of building technical systems to further enhance energy efficiency. Stakeholder involvement is crucial to the successful implementation of SRI and related initiatives. This includes government institutions, the Energy Regulatory Authority, building owners and developers, architects and engineers, the construction industry, Energy Service Companies (ESCOs), technology providers, research institutions, and industry associations. Each plays a unique role in developing, implementing, and advocating for energy efficiency measures and the adoption of smart technologies. Moreover, consumers and building occupants are increasingly interested in the benefits of smart and energy-efficient buildings, driving demand for SRI-compliant properties.

8 National priorities for incorporating SRI into policies and initiatives: Greece

8.1 Current status

The term Smart Readiness Indicator was officially introduced in the Greek legislation through adopting the amending Directive (EU) 2018/844 [2]. In the Greek Law¹, it is stated that “a Smart readiness indicator for buildings is established, which expresses the ability to adapt the operation of the building or building unit to the needs of the occupants and the network and the possibility of improving its energy efficiency and overall performance. The Smart Readiness Index is based on features related to energy savings, benchmarking and flexibility, enhanced functionality and capabilities resulting from more connected and intelligent devices.” However, the procedure to apply the SRI in the Greek buildings has not yet been defined. Although there are some discussions regarding the implementation of the SRI, no decision has been taken. Additionally, Greece does not participate in the SRI national test phase launched by the EU.

8.1.1 Review of existing national and regional regulations and policies

Building standards

Table 12. Building related standards in relevant fields.

Field	Standards
Energy efficiency	The regulation of energy efficiency in buildings uses all the European energy efficiency standards prepared specifically for the EPBD.
Renewable energy	<p>ΕΛΟΤ EN 15316-4-1 E2 Ενεργειακή επίδοση κτιρίων - Μέθοδος υπολογισμού ενεργειακών απαιτήσεων και αποδόσεων συστήματος - Μέρος 4-1: Συστήματα παραγωγής θέρμανσης χώρων και ΖΝΧ, συστήματα καύσης (λέβητες, βιομάζα) Ενότητα M3-8-1, M8-8-1 (Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass), Module M3-8-1, M8-8-1)</p> <p>ΕΛΟΤ EN 15316-4-2 E2 Ενεργειακή επίδοση κτιρίων - Μέθοδος υπολογισμού ενεργειακών απαιτήσεων και αποδόσεων συστήματος - Μέρος 4-2: Συστήματα παραγωγής θέρμανσης χώρων, συστήματα αντλιών θερμότητας, Ενότητες M3-8-2, M8-8-2 (Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-2: Space heating generation systems, heat pump systems, Module M3-8-2, M8-8-2)</p> <p>ΕΛΟΤ EN 15316-4-3 E2 Ενεργειακή επίδοση κτιρίων - Μέθοδος υπολογισμού ενεργειακών απαιτήσεων και αποδόσεων συστήματος - Μέρος 4-3: Συστήματα παραγωγής θερμότητας, ηλιοθερμικά και φωτοβολταϊκά συστήματα, Ενότητες M3-8-3, M8-8-3, M11-8-3 (Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-3: Heat generation systems, thermal solar and photovoltaic systems, Module M3-8-3, M8-8-3, M11-8-3)</p>

¹ Greek Law N. 4014/2011, N.4122/2013 & N.4685/2020 for the incorporation into the Greek legislation of Directives 2018/844 and 2019/692 of the European Parliament and of the Council and other provisions

Smart technologies	<p>ΕΛΟΤ EN ISO 16484-1 Συστήματα αυτοματισμού και ελέγχου κτιρίων - Μέρος 1: Προδιαγραφές έργου και εφαρμογή (Building automation and control systems (BACS) - Part 1: Project specification and implementation) (ISO 16484-1:2010)</p> <p>ΕΛΟΤ EN ISO 16484-5 Ε5 Συστήματα αυτοματισμού και ελέγχου κτιρίων (BACS) - Μέρος 5: Πρωτόκολλο επικοινωνίας δεδομένων (Building automation and control systems (BACS) - Part 5: Data communication protocol) (ISO 16484-5:2022)</p> <p>ΕΛΟΤ EN ISO 16484-6 Ε4 Συστήματα αυτοματισμού και ελέγχου κτιρίων (BACS) - Μέρος 6: Δοκιμές συμμόρφωσης επικοινωνίας δεδομένων (Building automation and control systems (BACS) - Part 6: Data communication conformance testing) (ISO 16484-6:2020)</p> <p>ΕΛΟΤ EN 50090.09.01 Ηλεκτρονικά συστήματα για οικίες και κτίρια (HBES) - Μέρος 9-1: Απαιτήσεις εγκατάστασης - Γένια καλωδίωση για συνεστραμμένο ζεύγος HBES τάξης 1 (Home and Building Electronic Systems (HBES) - Part 9-1: Installation requirements - Generic cabling for HBES Class 1 Twisted Pair)</p> <p>ΕΛΟΤ EN IEC 60730-2-8 Ε3 Αυτόματες ηλεκτρικές διατάξεις ελέγχου οικιακής και παρόμοιας χρήσης - Μέρος 2-8: Ειδικές απαιτήσεις για ηλεκτρικές βαλβίδες νερού, συμπεριλαμβανομένων μηχανικών απαιτήσεων (Automatic electrical controls for household and similar use - Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements)</p> <p>ΕΛΟΤ EN IEC 60730-2-13 Ε3 Ηλεκτρικές διατάξεις αυτόματου ελέγχου - Μέρος 2-13: Ειδικές απαιτήσεις για διατάξεις ελέγχου με αισθητήρες υγρασίας (Automatic electrical controls - Part 2-13: Particular requirements for humidity sensing controls)</p> <p>ΕΛΟΤ EN IEC 60730-2-9 Ε4 Ηλεκτρικές διατάξεις αυτόματου ελέγχου - Μέρος 2-9: Ειδικές απαιτήσεις για διατάξεις ελέγχου με αισθητήριο θερμοκρασίας (Automatic electrical controls - Part 2-9: Particular requirements for temperature sensing controls)</p> <p>ΕΛΟΤ EN IEC 60730-2-14 Ε2 Ηλεκτρικές διατάξεις αυτόματου ελέγχου - Μέρος 2-14: Ειδικές απαιτήσεις για ηλεκτρικούς ενεργοποιητές (Automatic electrical controls - Part 2-14: Particular requirements for electric actuators)</p> <p>ΕΛΟΤ EN IEC 60730-2-14 Ε2 Ηλεκτρικές διατάξεις αυτόματου ελέγχου - Μέρος 1: Γενικές απαιτήσεις (Automatic electrical controls - Part 1: General requirements)</p>
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Energy efficiency and renewable energy

Table 13. Energy efficiency and renewable energy: policy instruments at national and regional level.

Mandatory	Voluntary	Responsible institution	What works well	Barriers if existent
National				
Buildings regulation		Ministry of Environment and Energy	Control of minimum requirements, EPC DB	Erroneous certificates
National Plan for Energy and Climate (NECP)		Ministry of Environment and Energy	National energy targets, decarbonization	Unstable global energy situation

Independent control system		Ministry authority	Based on EPC database environment	
National subsidy programs				
Exoikonomo 2021	Housing subsidy scheme	Ministry of Environment and Energy	SMART HOME measures are subsidized by the National financial instrument for residential buildings (“Exoikonomo” eligible measures 5th category)	
Exoikonomo - Autonomo 2020	Housing subsidy scheme	Ministry of Environment and Energy		
ELEKTRA program [Πρόγραμμα «ΗΛΕΚΤΡΑ» - Energy renovation of public buildings]	Financing scheme for public buildings	Deposit and Loan Fund (Ταμείο Παρακαταθηκών και Δανείων) https://hlekttra.gov.gr/home		
Change of hot water boiler	Housing subsidy scheme			
PVs in roofs (Φωτοβολταϊκά στη στέγη)	Residential and agriculture sectors	Ministry of Environment and Energy		Complicated approval procedures
Renovate – Rent (Ανακαινίζω – Ενοικιάζω)	Housing subsidy scheme	Ministry of Environment and Energy		

Legend: Green: only for residential buildings; Blue: only for non-residential buildings

Thermal comfort

Thermal comfort is taken into account according to the requirements set in EN 15251 and provided in a Technical Guide (TOTEE 20701-1) supporting the implementation of the Buildings Regulation. It is applied in every building category and specifies the air temperature and relative humidity an indoor space must have in both winter and summer, conditions. Guidelines for the required fresh air conditions are also set.

Indoor-air quality

There are no mandatory requirements regarding indoor air quality but there are national guidelines for air changes in buildings (National Technical Guide TOTEE 20701-1). EPC does not provide any information regarding IAQ apart from a tick box showing if indoor air quality has been taken into consideration during the energy audit process.

Smart technologies: Building Automation and Control Systems

National Technical Guide TOTEE 20701-1 describes the Building Automation and Control techniques, presents the building automation categories, and their contribution to energy consumption of a building for both the residential and tertiary sector.

In new buildings, equipment of self-regulating devices is installed for the autonomous regulation of the temperature in each room or, where this is justified, in a designated heated zone of the building unit, as long as it is technically and economically feasible.

In existing buildings, the requirements for the installation of new technical building systems or for their replacement or upgrade are determined with the Greek Regulation for energy efficiency of buildings - KENAK, which are applied to the extent that this is technically, functionally and economically feasible. Additionally, the installation of self-regulating devices is required when a new one is installed or the heat production unit that uses them is replaced, as long as it is technically and economically feasible.

Smart technologies: Storage / Grid Flexibility

The ambitious target for e-cars in the NECP, is half a million until 2030 which means increasing country's electricity consumption by 3.3%. The Greek government is also committed to the ambitious targets for zero emissions transport and renewables penetration through the NECP necessitating the shift expansion of the charging infrastructure. A great barrier is the time required to connect EV chargers to the grid. Three elements materialize the gearing up the grid to cater all the new demand:

- smart chargers (already mandatory in the e-mobility law since 2020)
- digitalization of the grid
- dynamic pricing on the electricity bill (legal framework is existing but closer cooperation of the involved authorities and companies is needed)

Flexibility is the ability of consumers to adjust their demand when they receive appropriate incentives. Flexibility will allow the charging to the existing grid without costly expansion.

According to HEDNO (Hellenic Electricity Distribution Network Operator), 1.5 million houses are able to charge electric cars in the range of 11KW-22 KW.

HEDNO is currently working on three pillars:

1. Increasing the infrastructure
2. Dynamic pricing and dynamic zone charging
3. Enforce the official declaration of the EV charges

Table 14. Overview of policy instruments in the area of storage and grid flexibility.

Mandatory	Voluntary	Responsible institution	What works well	Barriers if existent
National				
	Installation of RES units by self-producers with net metering	Ministry of Energy & Environment		
LAW 4710 for the e-mobility		Government and related ministries	Incentives	
National subsidy programs				
PVs in roofs	Residential and agriculture sectors	Ministry of Environment and Energy		Complicated approval procedures
I MOVE ELECTRICALLY	EV	Ministry of Infrastructure and Transport	Financial instrument	
GREEN TAXI	EV	Ministry of Infrastructure and Transport	Financial instrument	

More information regarding the residential charging can be found in the links below:

[National Registry hubs and e-mobility market](#)

[Regulatory framework for the e-mobility](#)

More information regarding the residential RES production can be found in the links below:

[Net metering](#)

[Residential PVs](#)

8.1.2 Possibilities of incorporating smart readiness into voluntary building assessment approaches

The SRI can be linked in existing ongoing voluntary building assessment schemes such as LEED, BREAM, DGNB, and specific national schemes which are used for funding renovation activities in the building stock (e.g., Green neighbourhood, Ktizontas to melon [<http://ktm.cres.gr/index.php/epaggelmatika-ktiria>]).

The procedure may follow the following steps:

- Identify the voluntary building assessment schemes used at national level and the key stakeholders
- Analyze the links with smart readiness aspects and identify gaps or areas where updates are needed to facilitate smart readiness

8.1.3 Identification of key stakeholders for discussion

The following table provides an overview of stakeholders to discuss with in Greece.

Table 15. Overview of organisations and topics.

Organisation	Topics
Ministry of Environment and Energy – Energy Efficiency Division	National energy targets, policy making
Ministry of Environment and Energy – Building Inspectorate Body	Independent control authority
Ministry of Infrastructure and Transport	EV, charging hubs
PPC Group	https://www.ppcgroup.com/en/ppc-group/
DEH BLUE	Charging
HEDNO S.A. (Hellenic Electricity Distribution Network Operator S.A.)	National grid
Regulatory Authority for Energy	Energy market, REMIT, Integration of grid flexibility
Panhellenic Association of Certified Energy Auditors - PSYPENER (Πανελλήνιος Σύλλογος Πιστοποιημένων Ενεργειακών Επιθεωρητών – ΠΣΥΠΕΝΕΠ)	Energy auditors
Hellenic Association of Energy Suppliers - ΕΣΠΕΝ «Ελληνικός Σύνδεσμος Προμηθευτών Ενέργειας»	https://espen.gr/ grid, electricity providers

HAIPP ΕΣΑΗ - Hellenic Association of Independent Power Producers (Ελληνικός Σύνδεσμος Ανεξαρτήτων Εταιρειών Ηλεκτρικής Ενέργειας)	Private electrical energy producers http://haipp.gr/ grid
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Other possible stakeholders that can be useful in the SRI implementation are:

- Technical Chamber of Greece-TEE <https://web.tee.gr/>
- Hellenic Association of Photovoltaic Companies <https://helapco.gr/en/>
- Real Estate Investment and Development Association
- Hellenic Property Federation
- Association of Greek Contracting Companies (SATE)

8.2 Conclusions

The SRI procedure is planned to be incorporated in the Greek legislation. The competent ministerial authority must select the building categories, in which the SRI will be applied, the calculation method, the assessment procedure, the assessors' requirements, and prepare the necessary legislative framework to ensure its implementation. Prior to this, however, a national plan on how the SRI will be exploited and contribute to the energy efficiency targets of Greece has to be prepared. Through this plan, national energy recommendations will be prepared, and initiatives set up. In this way, the impact of the SR index will be quantified and evaluated.

Rolling out infrastructure and penetration of the EVs to the grid will allow more renewables to the grid improving the energy mix on the system. Permits are the main constraint and not the cable connection. DSO (HEDNO) and the Ministry of Energy and Environment are working on the regulatory framework for the prosumers, the batteries and the short circuit.

9 National priorities for incorporating SRI into policies and initiatives: Ireland

9.1 Current status

9.1.1 SRI test phase and related initiatives

Currently Ireland has not yet started an SRI test phase. There is, however, a smart buildings initiative in Limerick, known as the Smart Building Living Lab (SMARTLAB) project² being operated by the University of Limerick with support from the Sustainable Energy Authority Ireland (SEAI).

The Smart Building Living Lab (SMARTLAB) project aims to install wireless sensor technology in 50 to 100 buildings in the Limerick Decarbonisation Zone and examine, on one hand, financial and technical barriers to the deployment of smart technologies, and on the other the opportunities that could arise from the adoption of the frameworks such as the EU Smart Readiness Indicator that would enable the uptake of smart technologies and services in buildings across Ireland.

The project aims to create a framework for upgrading existing buildings to be smart using DIY toolkits and off-the-shelf components, identify the city-scale infrastructure that could be deployed to reduce the costs for building owners investing in their smart readiness, and methods to encourage uptake of the Smart Readiness Indicator (SRI) and associated smart services (energy and non-energy) that will empower smart energy citizens.

SMARTLAB asserts that it represents a unique opportunity to evaluate the technical and financial challenges and benefits of increased smart readiness for a broad range of construction methods, use cases, and use patterns and its communication using the Smart Readiness Indicator methodology. SMARTLAB adoption of a Living Lab approach intends to allow real impacts to be measured and quantified directly with citizens and stakeholders.

The work once evaluated is intended to directly inform policy (top-down) and the experiences of others (bottom-up) as well as validate the impact of the solution in a real-world environment over a 12–18-month period and ensure the long-term viability of the solution through co-creation with end users, stakeholders, and project partners.

Although SMARTLAB is not an SRI test project it is directly inspired by the SRI, references it and aligns to much of its methodology.

9.1.2 Overall policy framework

Ireland's National Energy & Climate Plan 2021-2030³ defines a roadmap to a net zero carbon energy systems objective by 2050. In terms of energy efficiency, a number of actions across various sectors will contribute to achievement of Ireland's national energy efficiency contribution. Further improving energy efficiency is central to our transition to a low carbon economy. Using less energy in a more flexible way is the most cost-effective and accessible way we can tackle climate disruption. Ireland is committed to applying the energy efficiency first principle to all proposals, decisions and investments flowing from this Plan. This Plan commits to a wide range of ambitious and far-reaching policies and measures aimed at improving the energy efficiency of the building stock as follows:

- All new dwellings are built to NZEB standard from 1 November 2019.
- Setting stricter requirements for new buildings and substantial refurbishments. Building a supply chain and a model for aggregation where home retrofits are grouped together.
- 500,000 homes retrofitted to a BER of B2 or cost-optimal equivalent by 2030.

² https://smartlablimerick.ie/?page_id=43

³ https://www.dccae.gov.ie/en-ie/energy/publications/Documents/26/National_Energy_and_Climate_Plan2021-2030.pdf

- Public sector buildings to have a BER of B by 2030.
- One third of commercial (including mixed use) buildings to have a BER of B (or carbon equivalent gains) by 2030.
- 600,000 heat pumps installed over the period 2021-2030.
- Effectively ban the installation of oil boilers from 2022 and the installation of gas boilers from 2025 in all new dwellings through the introduction of new regulatory standards for home heating systems. Progressively phase out oil and gas boilers in existing dwellings through a combination of incentives, information and regulatory measures.
- Ensure that a suitable policy framework is in place to support district heating.
- A 50% energy efficiency target for the Public Sector by 2030.
- Scale-up and improve the Sustainable Energy Communities and Better Energy Communities (BEC) programme and enlist a wider range of organisations to anchor its collective approach.
- Develop the necessary supply chain, including working with Regional Skills Fora to train skilled workers.

In addition Ireland has adopted a national renovation strategy⁴ for the building stock. The Long-Term Renovation Strategy 2020 includes the policies and measures currently in place or in development to encourage and support the renovation of the national building stock to ensure Ireland has a highly energy-efficient and decarbonised building stock by 2050.

The Programme for Government commits to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 (a 51% reduction over the decade) and to achieving net zero emissions by 2050. This will require a significant increase in the level and depth of building retrofits that will be carried out. In order to support this increase, further policies and measures will need to be developed.

9.1.3 Building energy performance regulations

The EPBD energy performance requirements for new and existing buildings are transposed into Irish law through the EC Energy Performance of Buildings Regulations 2006 – 2019. Technical Guidance Document Part L provides detailed guidance for designers, specifiers and other building professionals on compliance with the requirements. The Dwelling Energy Assessment Procedure (DEAP) and Non-dwelling Energy Assessment Procedure (NEAP) methodologies and software calculate primary energy use and associated CO₂ emissions for space heating and (where applicable) cooling, ventilation, associated motive power and lighting, under standard conditions of use.

Ireland's building energy performance regulations are set out separately for residential⁵ and non-residential buildings⁶. The provisions set out energy performance requirements for both new and existing buildings and those undergoing major renovations. Requirements are set at the whole building level, for building components and also at the technical building system level. In the case of new buildings, a minimum proportion of the energy demand has to be met by renewable energy systems. The stringency of the requirements has been ramped up progressively over the years in line with Ireland's commitments under its National Energy & Climate Plan.

9.1.3.1 Building Automation and Control Systems (BACS)

From 31st December 2025 building owners and tenants will be required to install building automation and control systems in buildings where the effective rated output of heating, air-conditioning and ventilation system(s) in a building is above a threshold of 290 kW.

There is potential exemption if installation of the required BACS is deemed not technically or economically feasible based on independent assessment.

⁴ <https://www.dccae.gov.ie/en-ie/energy/topics/Energy-Efficiency/energy-efficiency-directive/ireland's-national-renovation-strategy/Pages/Ireland's-Renovation-Strategy.aspx>

⁵ https://www.gov.ie/en/publication/d82ea-technical-guidance-document-l-conservation-of-fuel-and-energy-dwellings/?referrer=https://www.housing.gov.ie/sites/default/files/publications/files/tgd_l_dwellings_2019.pdf

⁶ https://www.housing.gov.ie/sites/default/files/publications/files/tgd_l_2017_for_buildings_other_than_dwellings.pdf

Guidance⁷ is supplied by SEAI.

9.1.4 EPCs in Ireland

As the delegated and implementing acts for the SRI explicitly mention the option of integrating SRI issuance with the issuance of EPCs it is pertinent to consider how that process works to inform consideration of synergies and differences. This section reports the current practice in Ireland with regard to the issuance of EPCs, known as Building Energy Ratings (BERs) or Display Energy Certificates (DECs) in Ireland.

SEAI (Sustainable Energy Authority of Ireland) is the issuing authority for the administration of the Building Energy Rating (BER) or EPC scheme. The DEAP⁸ and NEAP⁹ software, published by SEAI, are compliant with EN 13790 and serve the dual purpose of demonstrating compliance with Part L (Conservation of Fuel and Energy) of the Building Regulations and generating the BER or EPC and advisory report. Building control officers in local authorities are empowered to carry out inspections and, where necessary, undertake enforcement action in order to ensure compliance with the requirement to have an EPC.

The SEAI is responsible for the administration of the building energy rating scheme including the quality checks for published EPCs. Enforcement to ensure that a valid EPC is in place on construction, sale or rental lies with the Local Authorities.

Ireland uses asset based EPCs (BERs) for residential and commercial buildings and operational based EPCs (DECs) for public buildings. The methodological approach borrows from and largely aligns to methods developed and applied in the UK. Each are described below.

9.1.4.1 Asset based EPCs

Building Energy Ratings (BERs) (asset based EPCs) are issued in Ireland for domestic buildings. Performance is ranked from A to G.

In the case of residential buildings, the Dwelling Energy Assessment Procedure (DEAP) is used by BER assessors to calculate the energy performance and carbon dioxide emissions of a home's space heating, water heating, ventilation and lighting. The DEAP consists of a software tool with supporting guidance manuals. BER Assessors use DEAP to publish Building Energy Rating (BER) certificates and advisory reports for homes. DEAP is also the compliance tool specified in Part L of the Irish Building Regulations. The DEAP software is web-based and used to calculate the annual delivered energy consumption, primary energy consumption (kWh/m²/year) and carbon dioxide emissions (kgCO₂/m²/y) for standardised occupancy. Only registered BER assessors can publish BER certificates and advisory reports through DEAP.

The DEAP Manual¹⁰ describes the assessment methodology for dwellings and must be followed alongside the DEAP Survey Guide¹¹. The latest manual (version 4.2.5) was updated in January 2024.

The DEAP Survey Guide describes the DEAP survey methodology for dwellings. This must be followed alongside the DEAP Manual. The latest Survey Guide (version 4.1) was updated in January 2024.

In addition:

- a DEAP Guidance Document (version 4.0) is available and was last updated in July 2021.

⁷ <https://www.seai.ie/business-and-public-sector/standards/bacs-regulations/>

⁸ Domestic Energy Assessment Procedure (NEAP)

⁹ Non-domestic Energy Assessment Procedure (NEAP)

¹⁰ https://www.seai.ie/publications/DEAP_Manual.pdf

¹¹ <https://www.seai.ie/home-energy/building-energy-rating-ber/support-for-ber-assessors/software/deap/DEAP-Survey-Guide-Version-4.1.pdf>

- a DEAP workbook¹² used as the BER calculator is available in Microsoft Excel format. This workbook can be used to view all of the calculation formulas within the DEAP software. The latest version (4.2.0 v1.4) was last updated in January 2023.

9.1.4.2 Operational based EPCs

The methodology is explained in two user guides¹³ issued by Sustainable Energy Authority Ireland and is summarised below.

How is the delivered energy measured?

The user guide describes the calculation tool for the calculation of a display energy certificate (DEC). This is the Irish official procedure for calculating and assessing the energy performance within public buildings.

The methodology requires to determine:

- Building Category
- Location of Building (Building Name, Address)
- Basic Technical Characteristics of the building
- Separable Energy uses if any
- Total Useful Floor Area of the building (and how it has been obtained) or other allowed area metric including
- Total Useful Floor Area attributable to each benchmark category and to separable energy use (where exists)
- Recorded hours of occupancy
- Energy consumption (meter readings or suppliers estimates) and measurement period
- Results of previous DEC assessments, where they exist.
- How is the rating performed (reference building or average building stock performance)

The operational energy use is compared to Benchmarks for similar Building Categories/ Types. 29 reference building types are defined. Where a building has a mix of uses that would place parts of the building in different benchmark categories the number of different building types is entered. A maximum of 5 building types is allowed (results are normalised by useful floor area).

What indicators are delivered (building or building use)?

An operational BER for the building with performance expressed as a grade on a subdivided A - G scale. scale expressing the equivalent primary energy consumption per unit floor area as a percentage of a value that would be considered typical for the particular type of building;

- A primary energy indicator expressed in terms of primary energy use per unit floor area;
- a subsidiary CO₂ performance indicator shown as a position on a linear scale representing the annual CO₂ emission per unit of area of the building caused by its consumption of energy as a percentage of a value that would be considered typical for the particular type of building) together with a numerical indicator of the CO₂ emissions of the building;
- Histograms of trends in energy and CO₂ performance in up to three most recent years.
- A Building identifier, e.g., name, address. This should be sufficient to uniquely identify the building;
- Basic building technical information, e.g., building type, floor area, main heating fuel, main heating/cooling type, sufficient to assist understanding of the more detailed information contained on the certificate;
- A unique DEC number, provided by SEAI;

¹² <https://www.seai.ie/home-energy/building-energy-rating-ber/support-for-ber-assessors/software/deap/DEAP-4.2-v1.4.xlsx>

¹³ <https://www.seai.ie/publications/Public-Buildings-Technical-Manual.pdf>
<https://www.seai.ie/publications/Public-Buildings-User-Guide.pdf>

- Period of validity of the certificate. This commences on a Nominated date chosen by SEAI. The period is for 365 days. For other than the first DEC for a building, there should be no gap from period covered by previous DEC but there may be overlap of up to 90 days where this facilitates preparation of the DEC taking account of the fuel measurement system and consumption data available;
- Unique assessor number. Each assessor is assigned a unique assessor number;
- Primary electrical and heating energy per unit floor area for the building being assessed and for the relevant benchmark building type. For the building this is the net primary energy figure, excluding separable energy and any renewable energy generated on-site, derived for the assessment period of 365 days.

What utilities types are measured (H, C, DHW, V, L)

The calculation requires the main heating fuel to be designated from one of (Mains Gas, LPG, Heating oil Coal Anthracite, Smokeless fuel (inc. Coke), Biomass, Dual fuel appliances (mineral + wood), Electricity.

District Cooling District Heating) and for the user to indicate if the consumption is metered or estimated by the utility.

Normalization practices (weather, occupancy, level of services)

The calculation is based on the operational energy use within the building taking into account a range of factors that are used to normalize the energy consumption. The operational energy use is compared to Benchmarks for similar Building Categories/ Types. There are 29 Building Categories to choose from, the energy assessor selects the relevant benchmark category applicable to the building uses. Up to 5 building categories can be applied for the same building if it is multiple use. These are weighted by useful floor area. Additionally, the useful floor area can be further weighted as a function of the are used for specific functions: General office, General retail, Large non-food shop, Small food store, Large food store.

The impact of weather variation is addressed by normalisation of the heating energy demand against the heating degree days. The heating degree days within the measurement period are matched to the those reported by the nearest weather station over the same period. There are eight weather stations covering Ireland.

Normalisation is also done by the number of hours of occupancy. Standard occupancy is used based on the building category. Alternatively, "Extended Hours" may be selected if the energy assessor can demonstrate that the building is occupied for significantly longer periods than the standard hours quoted for the benchmark category and where the benchmark information includes for allowing correction for extended hours of use.

Separable Energy Uses

Buildings may include activities that consume energy and which are not considered typical of that building type. Including these activities could reduce the validity of the benchmark, and so it may be reasonable to subtract these separable energy uses in certain circumstances. Allowed separable uses are included as part of the benchmark information. No other energy uses may be separated for the assessment. The allowed separable energy uses are:

- Regional server room
- Trading floor
- Bakery oven
- Sports flood lighting
- Furnace, heat treatment or forming process
- Blast chilling or freezing.

Time span of measurements and duration of the certificate

The principal constraint on the measurement is an annual measurement of the heating energy. Specifically, the Main Heating Fuel Measurement Period must be 365 days +/- 31days to be accepted in the calculation. The start or end dates of all other energy measurement periods (i.e., for other energy types/end uses) must be aligned with the start and end dates of the assessment period within +/- 31days.

The certificate duration is 365 days from the Nominated Issue Date of the DEC. The Nominated Issue Date of the DEC must be within 180 days of the end of the assessment period.

Measurement practices – equipment, minimum requirements

In principle, an accurate meter reading of fuel and electricity consumption should be taken annually. If the date of meter reading, or other means of measurement, differs from the correct annual date, the date should be recorded. The energy assessor will select readings with start and end dates which as near as possible cover 365 days, and calculate the consumption from the difference between readings. The consumption and dates are entered into the software, which will adjust the consumption to 365 days. If the measurement period is outside the permitted tolerances the software will default to an operational rating grade G - the poorest rating grade.

An alternative acceptable source of energy consumption data is utility bills. These may include estimates, which may be used if there is no other source of accurate readings. When estimates are used, energy assessors must specify that the data entered in the software is estimated. There should not be any reason to use estimated readings after the first year, as the requirement for readings will by then be fully understood.

Only estimates from utilities suppliers may be used.

Relation of operational with asset rating (if any)

None.

For what building categories this operational assessment is utilized?

Operational ratings are only applied to large public buildings and large private sector buildings which are frequently visited by the public. Such buildings are required to publicly display their energy performance via a display energy certificate (DEC). A large building is defined as one having a useful floor area in excess of 500m². Note, display energy certificates do not apply to dwellings which are subject to an asset rating EPC, called a building energy rating (BER).

The building categories addressed are shown in Table 16.

Table 16. Overview of building categories.

1. General office	16. Public buildings with light usage
2. High street agency	17. Schools and seasonal public buildings
3. General retail	18. University campus
4. Large non-foodshop	19. Clinic Health centres
5. Small food shop	20. Hospital — clinical and research
6. Large food shop	21. Long term residential
7. Restaurant	22. General accommodation
8. Bar, pub or licensed club	23. Emergency services
9. Hotel	24. Laboratory or operating theatre
10. Cultural activities Museum, art gallery or other public building	25. Public waiting or circulation
11. Entertainment halls	26. Terminal Regional transport terminal with concourse
	27. Workshop

9.2 Results of case study

The SMARTLAB project starting recruiting participants in the summer of 2023 and began installation of smarter sensor and control technology towards the end of that year. The results from monitoring are not yet gathered and analysed so findings will need to be reported in a later edition of this report. It is important to note that as the SMARTLAB project entails installation of smart sensors etc. and then monitoring the impact on building behaviour, its findings will not be akin to those from an SRI test phase as they do not monitor the SRI scores of unaltered extant buildings and they do not set out to test the process of training and quality assuring SRI

assessors. Nor do they explicitly explore the time it takes to conduct SRI assessments or the issues encountered when doing so. Rather SMARTLAB examines the interest in adopting smarter functionalities in buildings and then aims to document the impact of that adoption on building performance and user perceptions thereof.

With regard to a formal SRI test phase the Irish authorities are understood to be considering whether to begin one or not. If they do, this will be reported in subsequent versions of this deliverable.

9.3 Conclusions

It is premature to draw conclusions from Ireland's experiences with the SRI as there is currently no formal test phase and the SMARTLAB project has yet to report any findings; however, it may be possible to draw conclusions in future versions of this report. More generally, Ireland has successfully implemented other EPBD measures in line with requirements.

In general Ireland has fully transposed the EPBD requirements and is implementing them in line with public policy. The assessment methodologies it uses are well established and align to EBD standards. There is ample experience with EPCs (BERS and DECS) and in principle this experience could be adapted to support the issuance of SRIs.

10 Conclusions and recommendations

10.1 Summary of conclusions of the analysis carried out

SRI impact indicators can support the provisions of the forthcoming EPBD recast in the area of technical building systems, EPC and the renovation passport. For the latter two, the focus is on recommendations to improve building performance. Regarding technical building systems, the focus is on the installation of BACS and the SRI certificate could be used as proof. Compliance with some provisions can be checked using the SRI service catalogue. Compliance with other provisions could be confirmed if the easySRI platform offers a corresponding service. However, the limitation of technical, economic and functional feasibility leaves room for excuses not to comply.

SRI impact indicators can support the implementation of the amended Renewable Energy Directive and the recast Energy Efficiency Directive:

- Energy efficiency and grid flexibility and storage as documented by the SRI certificate are essential contributions to achieving the renewable energy targets.
- The recast EED article 11 on Energy management systems and energy audits contains provisions on energy audits which are specified in more detail by means of minimum criteria set out in Annex VI. It is obvious that there are similarities in terms of content and process between SRI assessment and energy audit. easySRI could address the need to align the qualification requirements for SRI assessors with those for energy auditors accredited for the buildings sector, and the easySRI platform could provide respective services.
- The easySRI platform could offer a special service for the public buildings sector, to assist with the implementation of recast EED article 6.

The easySRI platform could assist in the production of documents of proof for real estate companies to comply with the requirements of the Taxonomy Regulation and the CSRD:

- Proof of conformity with Taxonomy Regulation requirements: Evidence is required that could be provided using the easySRI platform. The points listed in the Annex I sections 7.3 to 7.7 are already covered directly or indirectly by the SRI service catalogue.
- ESG reporting in accordance with CSRD, according to ESRS: Evidence is required that could be provided using the easySRI platform. The points listed for ESRS E1, E5 and S4 are already covered directly or indirectly by the SRI service catalogue.

The National Energy and Climate Plan according to Governance Regulation is the mandatory instrument for national energy and climate planning and reporting. The application of the easySRI platform to improve building performance in various respect, relating to the EPBD, the EED and the RED, could be included as a policy measure in the NECP.

Regarding training, Build up Skills is the central program in the building sector. Guidance developed by easySRI could be made available to dedicated training platforms, or could be advertised and disseminated through the respective networks.

Relevant Initiatives are the Next generation EPC cluster of projects, the SRI cluster of projects, and the digital building logbook. Linking with other projects can help disseminate easySRI findings.

Regarding approaches, areas and responsible stakeholders for introducing SRI, the introduction of SRI can be voluntary in the form of guidelines, quasi-mandatory if there is a link to funding, and mandatory if there is a legal obligation. Investigation of national priorities will be continued in the second phase of task 6.1.

10.2 Practical ways to incorporate easySRI findings into policies

Priority should be given to links with the Taxonomy Regulation and ESG reporting according to ESRS: Real estate companies complain about the large number of certificates that are required in different contexts and the associated expenses for consultancy services. If the certificates generated with easySRI are also suitable as evidence for Taxonomy Annex I sections 7.3 to 7.7, and ESRS E1, E5 and S4, real estate companies would have a clear advantage from using the easySRI services.

The accordance with the digital building logbook is essential as it is not only mentioned in the EPBD but is also a focus set by DG GROW.

Appropriate processing of WP4 content will enable the link to these policy instruments and initiatives. In particular, this concerns the following tasks:

- easySRI core engine, including data input, calculation algorithms, and data output formats;
- easySRI service online web-application, including APIs, assessment results and certificates.

11References

- [1] *Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast) (EPBD)*. Accessed: Jul. 21 2023. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32010L0031&qid=1690031685504>
- [2] *Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency*. Accessed: Jul. 21 2023. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L0844>
- [3] Council of the European Union, "Proposal for a Directive of the European Parliament and of the Council on the energy performance of buildings (recast) - Analysis of the final compromise text with a view to agreement," Council of the European Union, Brussels, Dec. 2023. Accessed: Feb. 5 2024. [Online]. Available: <https://data.consilium.europa.eu/doc/document/ST-16516-2023-INIT/en/pdf>
- [4] *Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast)*. Accessed: Feb. 5 2024. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001>
- [5] *Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652*. Accessed: Jan. 3 2024. [Online]. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413
- [6] *Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast)*. Accessed: Jan. 3 2024. [Online]. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766
- [7] *Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council*. Accessed: Feb. 5 2024. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999>
- [8] *Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Taxonomy Regulation)*. Accessed: Jul. 21 2023. [Online]. Available: <https://eur-lex.europa.eu/eli/reg/2020/852/oj?locale=en>
- [9] *Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting*. Accessed: Jan. 15 2024. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022L2464>
- [10] European Commission, *Level(s) European framework for sustainable buildings*. [Online]. Available: https://environment.ec.europa.eu/topics/circular-economy/levels_en (accessed: Nov. 15 2023).
- [11] European Commission, *Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An SME Strategy for a sustainable and digital Europe: COM(2020) 103 final*. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A103%3AFIN> (accessed: Jan. 15 2024).
- [12] Universität für Weiterbildung Krems, *Reboot BUILD UP Skills Austria - ReBUSk*. [Online]. Available: <https://www.donau-uni.ac.at/en/university/faculties/education-arts-architecture/departments/building-environment/research/rebusk.html> (accessed: Feb. 12 2024).

- [13] *Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.*
- [14] *Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC.* Accessed: Feb. 12 2024. [Online]. Available: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0034>
- [15] *Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards.* Accessed: Feb. 12 2024. [Online]. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302772
- [16] European Commission, *Questions and Answers on the Adoption of European Sustainability Reporting Standards.* [Online]. Available: https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_4043 (accessed: Feb. 12 2024).
- [17] European Commission, *Level(s) common framework: Manual.* [Online]. Available: <https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents> (accessed: Feb. 9 2024).
- [18] Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und, *Der klimaaktiv Kriterienkatalog 2020.* [Online]. Available: https://www.klimaaktiv.at/dam/jcr:9bafa8e3-2c15-40b9-9a86-e4f0245fd430/20201027_Brosch%C3%BCre%20Basiskriterien%202020_final.pdf

Improving and demonstrating the potential of SRI



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This project has received funding from the European LIFE Programme for Research and Innovation under grant agreement no 101077169. Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.