



**SUSTAINABLE
PLACES 2024**

23-25 September 2024

Luxembourg



www.sustainableplaces.eu

LUXEMBOURG
INSTITUTE OF SCIENCE
AND TECHNOLOGY



R2M
RESEARCH TO MARKET
SOLUTION

Facilitating the energy transition: policy, finance, training

WORKSHOP

EPBD Implementation: Smartness for Energy Efficiency

24 September, 09h00 - 12h30 CEST



SRI2MARKET



These projects have received funding from the European Union's Horizon 2020, Horizon Europe and LIFE programmes. The European Union is not liable for any use that may be made of the information contained in the documents prepared by the projects' consortia, which are merely representing the authors' view.





**Multidisciplinary Approaches and Software Technologies for
Engagement, Recruitment and Participation in Innovative Energy
Communities in Europe**

Joining and participation AI-powered tool (ECOOP)

Dr.Habib NASSER, RDIUP

SP2024

24 September 2024

Luxembourg



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101096836

ECOOP (RDIUP)

Description of the tool: ECOOP is an open ecosystem that offers novel AI services to bring together managers, producers, and consumers, to build and scale energy communities through various digital tools. ECOOP delivers high, secure, trustful, and GDPR compliant solutions. This web platform serves as a foundation for establishing energy cooperatives and developing shared assets, fostering collaborative efforts in building a unique energy community.

Actual Status: Working and online version, to be improved (copyright RDIUP)

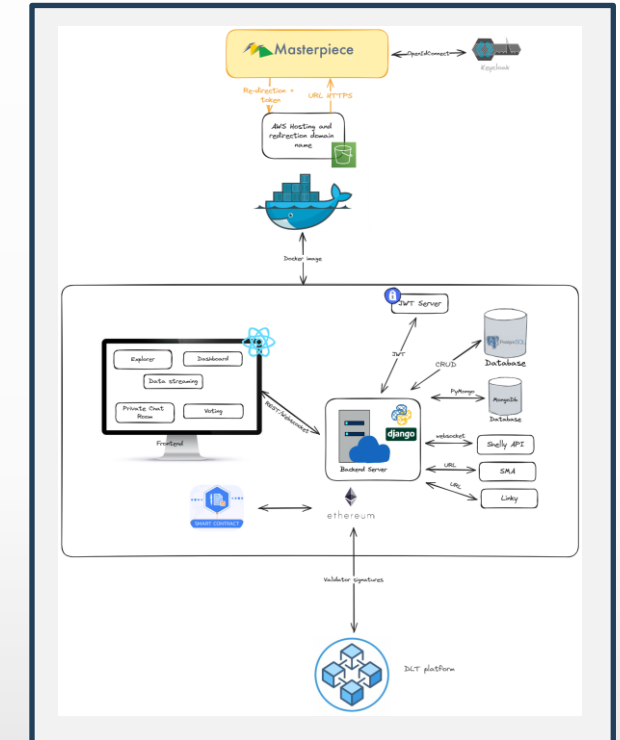
Main functionalities:

EC members and managers

- ECOOP enables participants (portfolios) to verify their eligibility to join ECs and send invitations.
- ECOOP provides a private chat interface to facilitate communication among members of different ECs, along with a voting system (Blockchain) to enhance governance.
- It also allows for the creation of meetings and events, as well as receiving notifications.
- ECOOP offers essential information, charts, and Key Performance Indicators (KPIs) about ECs,.
- ECOOP features a map-based exploration space to visualize ECs and portfolios, facilitating proximity eligibility studies through simple visual aspects.
- ECOOP provides an interface for configuring and unifying APIs (such as Shelly, Linky, and SMA).

EC managers

- ECOOP empowers EC managers to identify potential participants within eligible areas/conditions and send them invitations to join the EC.
- ECOOP offers a user interface space to configure benefits sharing and a section for monthly reporting by EC managers.
- ECOOP will introduce a new feature for signing and sharing official or private documents among EC members



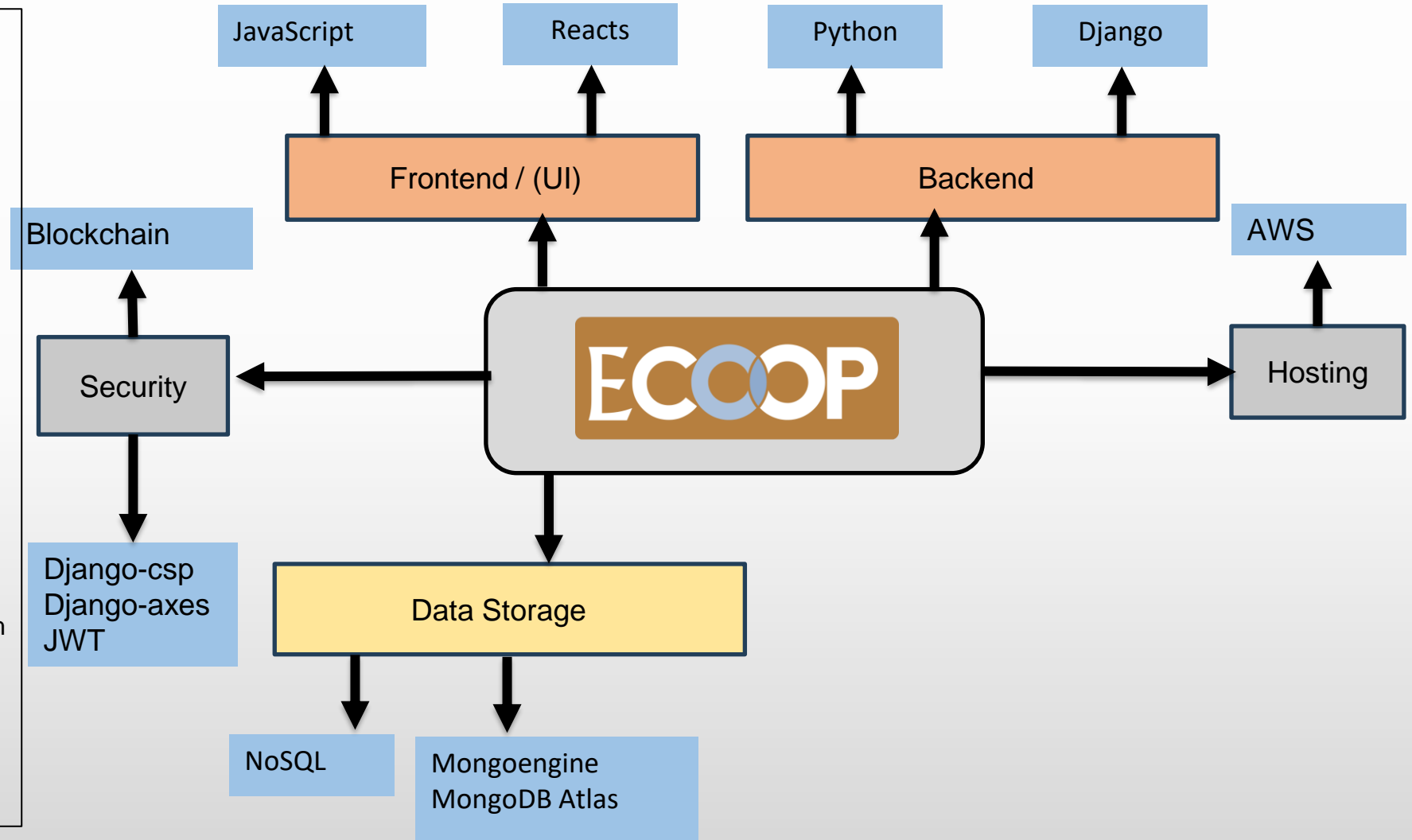
Description of the main technical developments :

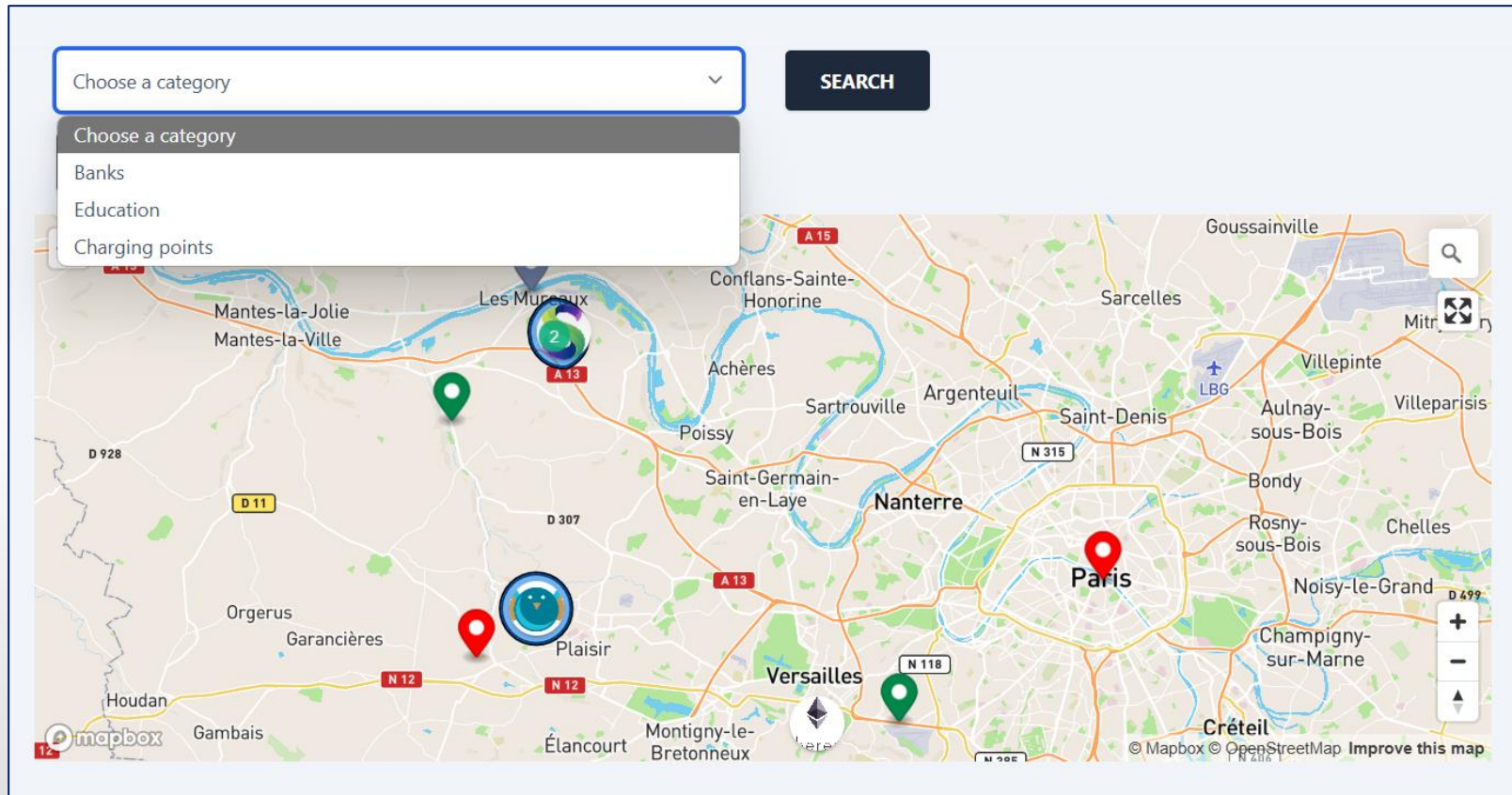
Backend

- Develop algorithms for sharging benefits
- Unify the API for data monitoring
- Implement the joing and invitation mechanims
- Include the local regulation linked to ECs

Frontend

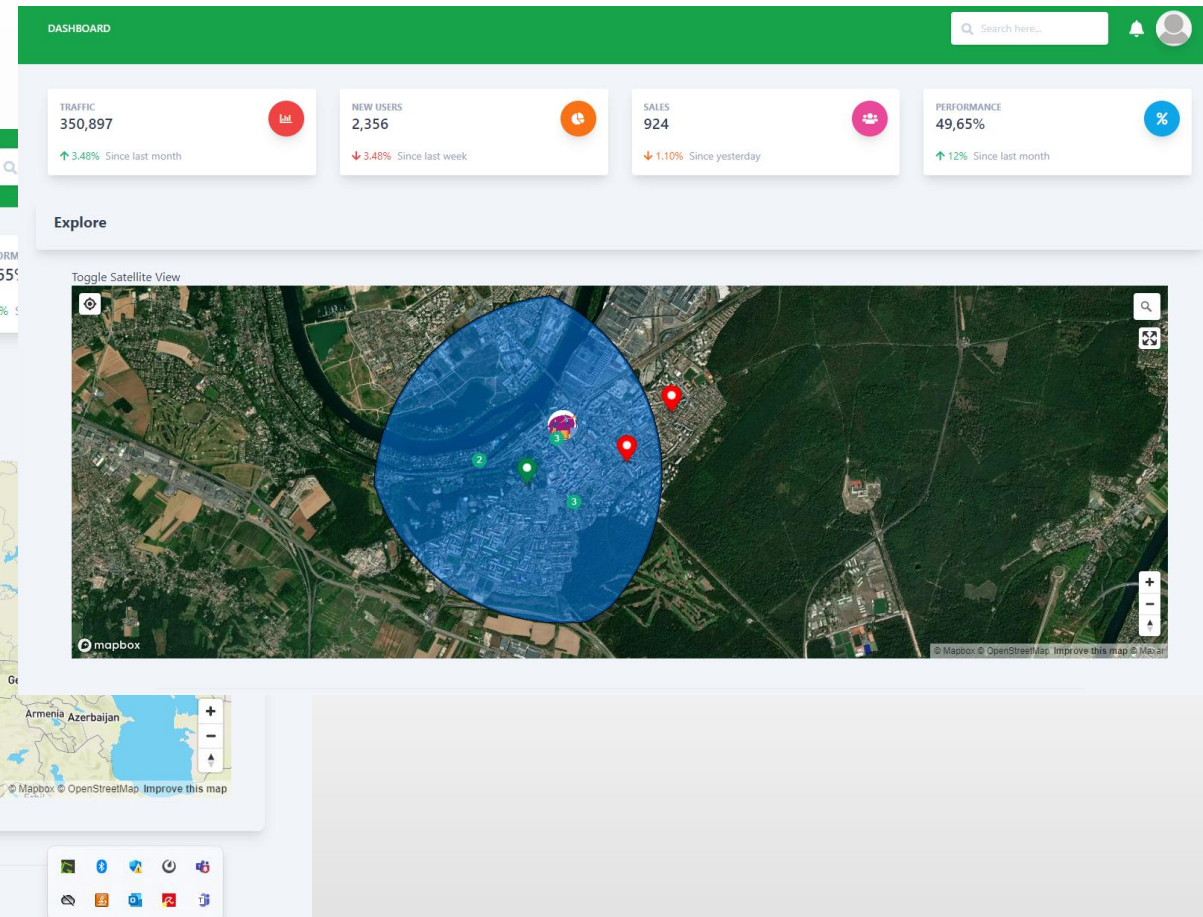
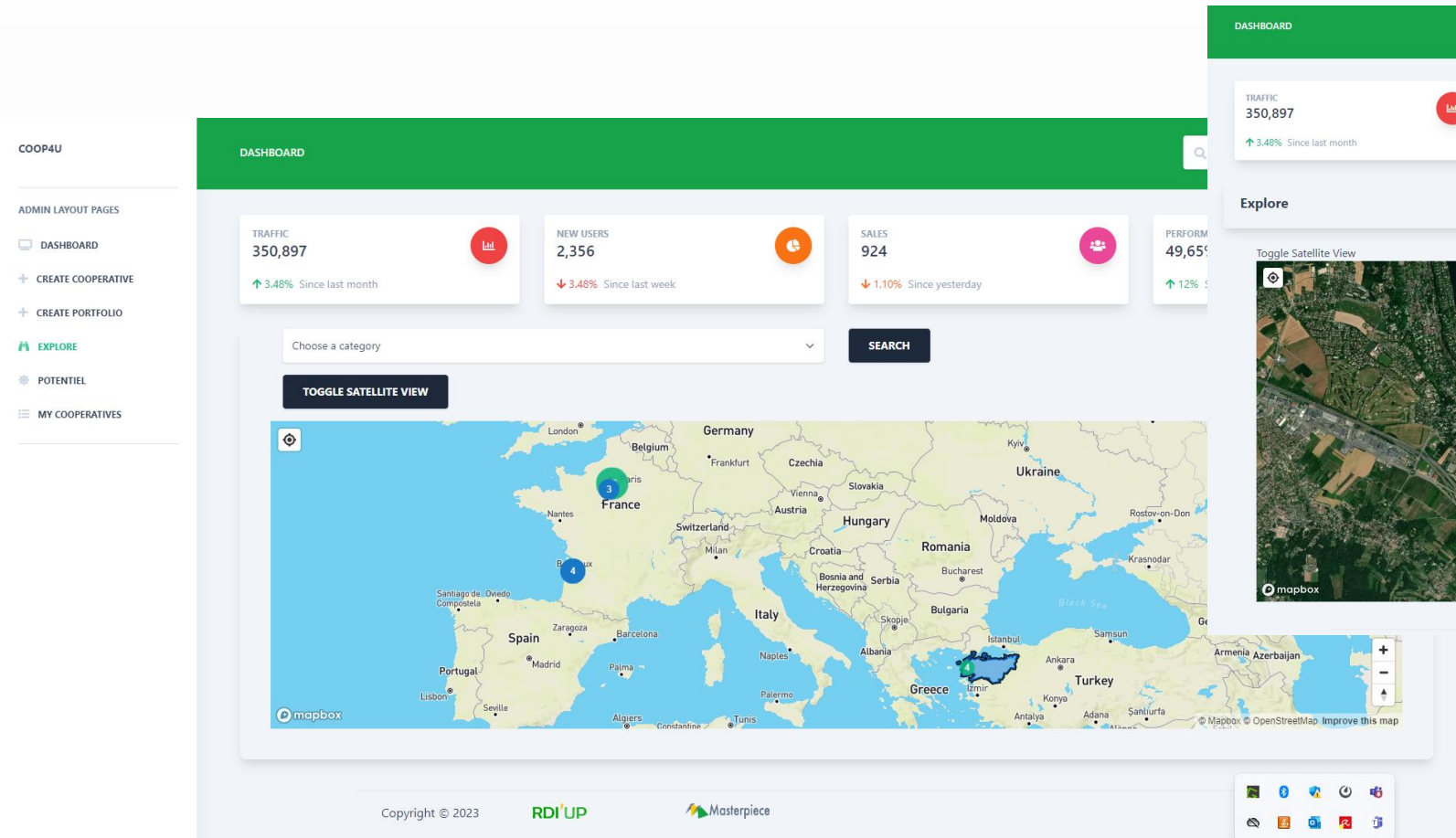
- Implement multi-language feature
- Add the notification for messages, events, votes and joining
- Enahnce the Cards for the private chatRoom and event interfaces
- Develop UIs for map-based exploration of ECs and portfolios
- Implement SignDoc UIs

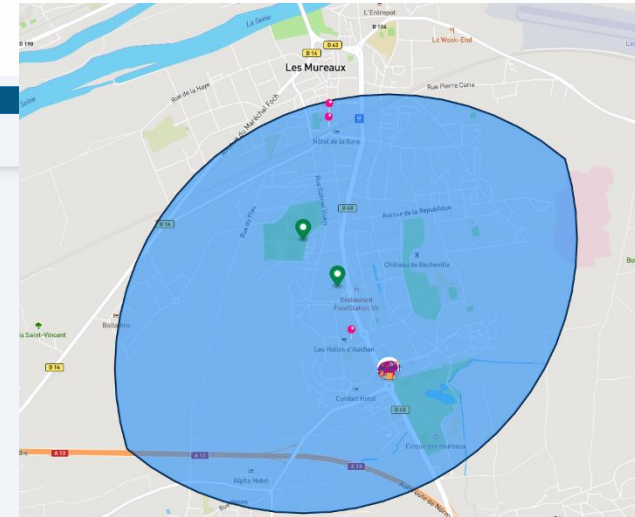
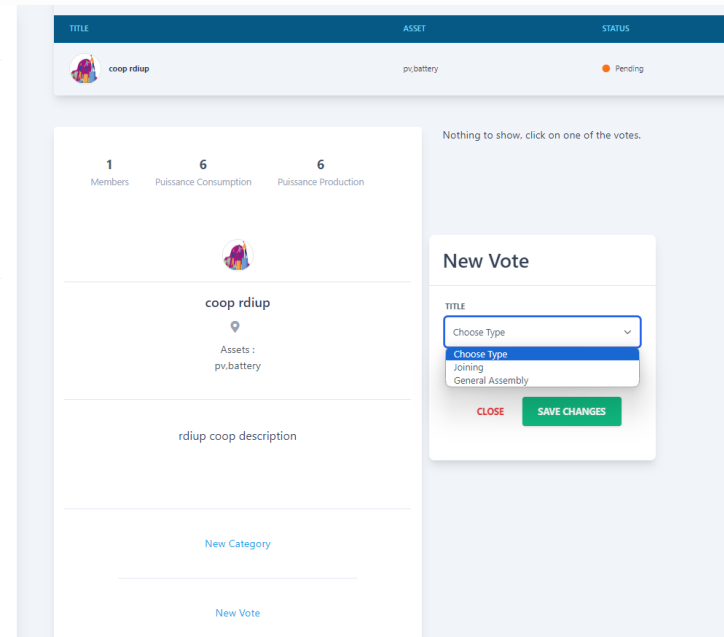
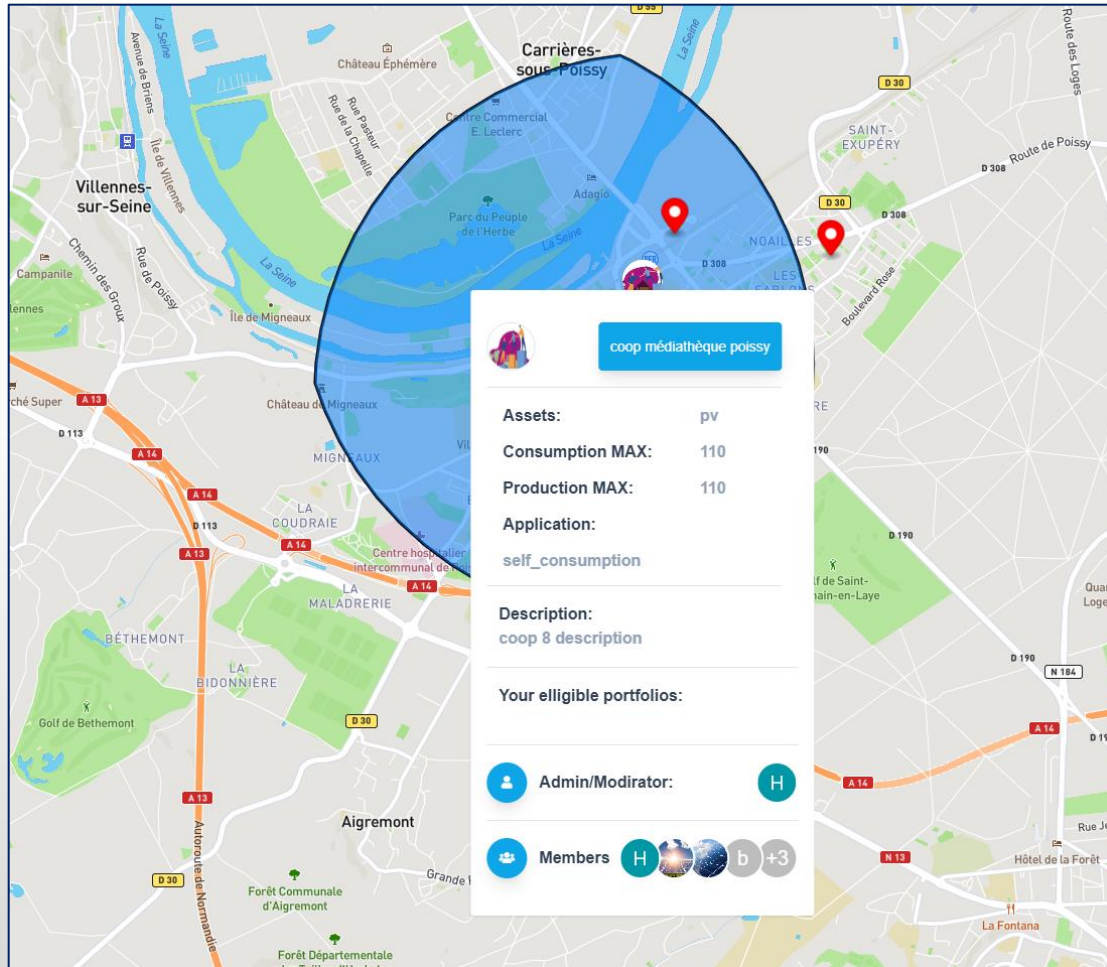




Map-based algorithm for eligibility analysis

- Markers
- Colors
- Participation
- Eligible or not

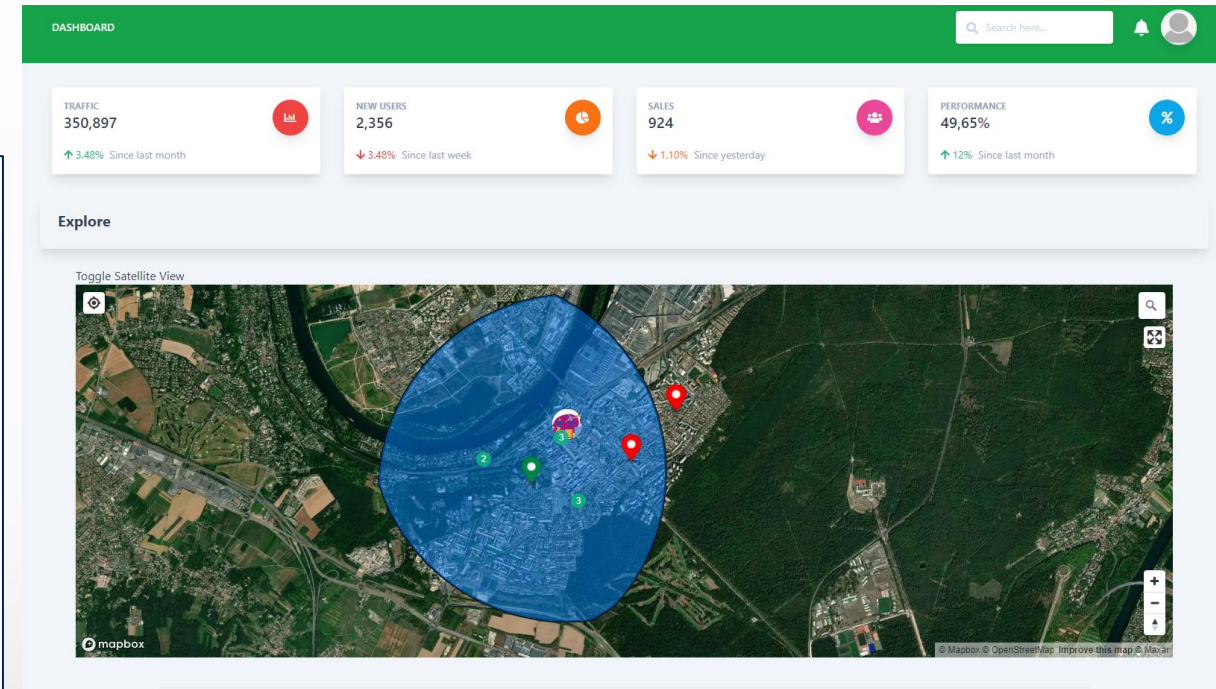
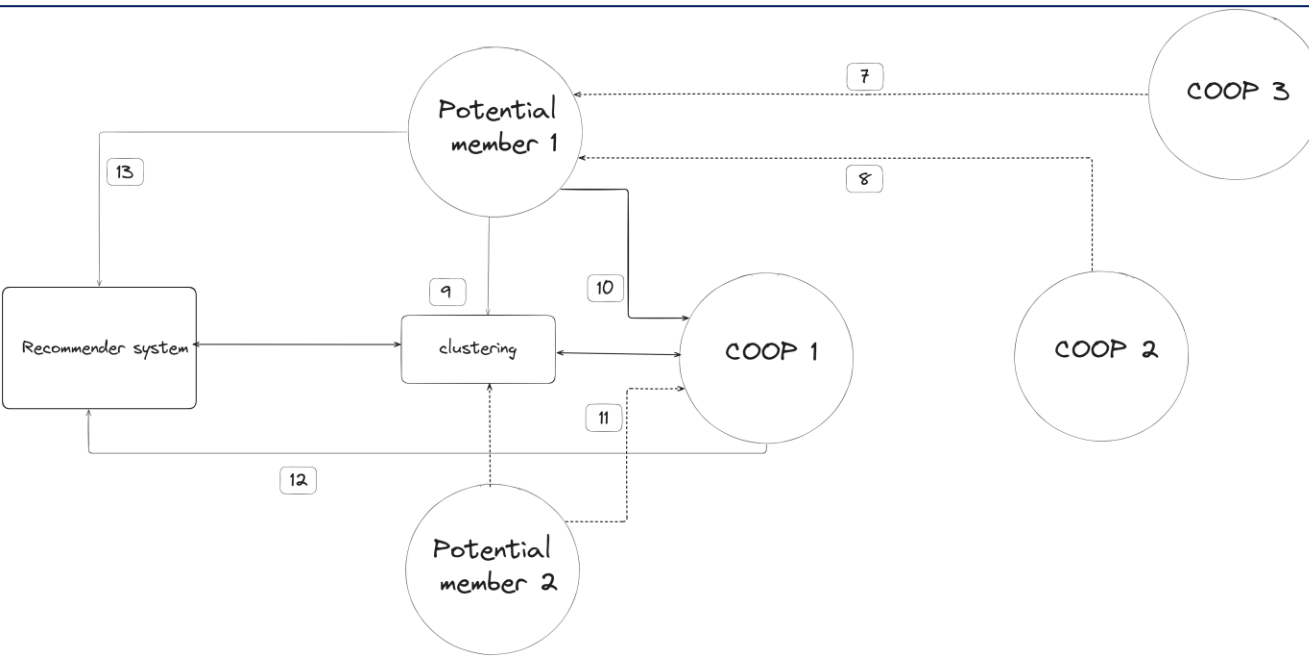




Possible participants (open data)

Vote for the internal participation policy

❖ Joining recommendation



❖ Monthly reporting of self-consumption

Manage Reporting

REPORTING INFORMATION

EC

MAGNA2

PRODUCTION

Production

KWh

CREATE

MONTH

Choose The Month

January

February

March

April

May

June

July

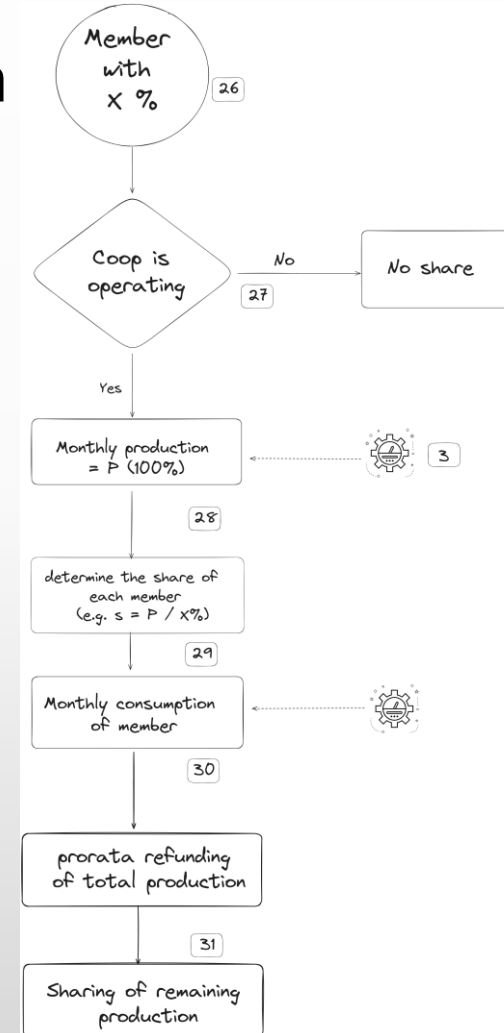
August

September

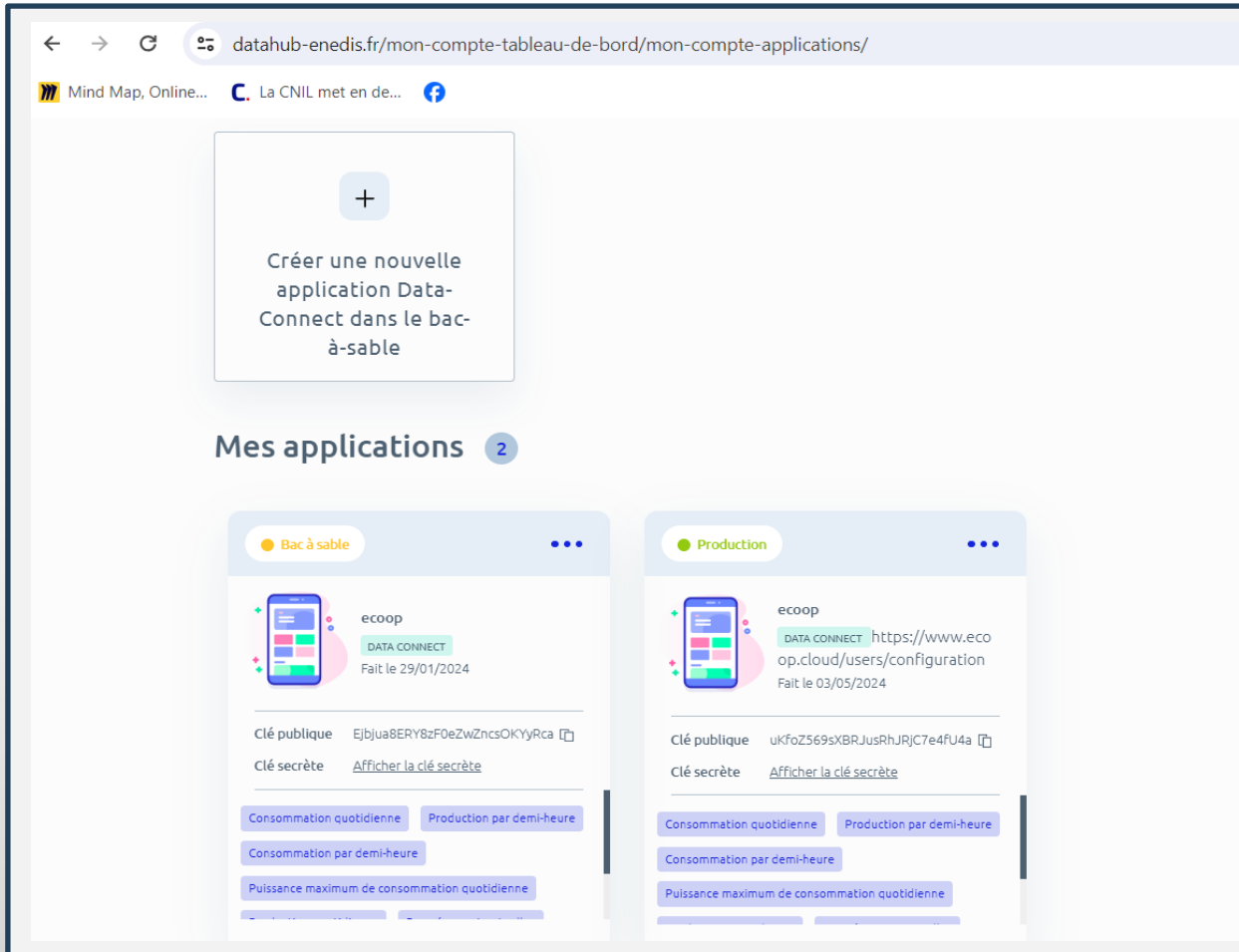
October

November

December



ECOOP (RDIUP)



datahub-enedis.fr/mon-compte-tableau-de-bord/mon-compte-applications/

Mind Map, Online... La CNIL met en de...

+

Créer une nouvelle application Data-Connect dans le bac-à-sable

Mes applications 2

Bac à sable

ecoop

DATA CONNECT

Fait le 29/01/2024

Clé publique EjbJua8ERY8zF0eZWZncsOKYyRca

Clé secrète [Afficher la clé secrète](#)

Consommation quotidienne Production par demi-heure

Consommation par demi-heure

Puissance maximum de consommation quotidienne

Production

ecoop

DATA CONNECT <https://www.ecoop.cloud/users/configuration>

Fait le 03/05/2024

Clé publique ukFoZ569sXBRJusRhJRjC7e4FU4a

Clé secrète [Afficher la clé secrète](#)

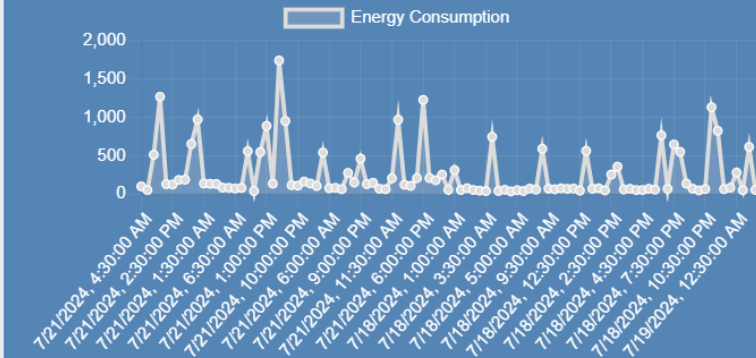
Consommation quotidienne Production par demi-heure

Consommation par demi-heure

Puissance maximum de consommation quotidienne

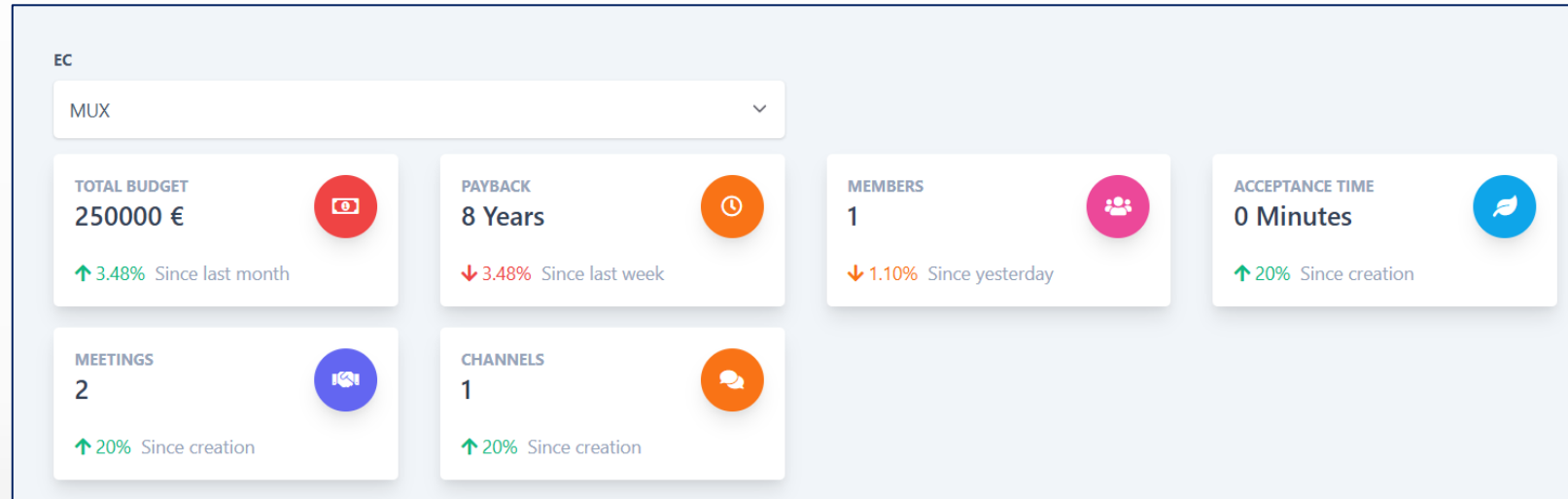
OVERVIEW

Reporting value



KPIs:

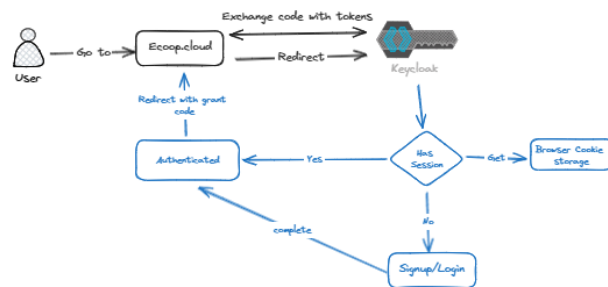
- Number of accounts and logins
- Time from invitation to acceptance
- Participation frequency in private chat rooms and discussions
- Time spent on ECOOP (Utilization time)
- Volume and frequency of data exchange within EC
- Rating and feedback
- Dashboard to display key reporting data
- Periodic custom reports
- Number of meetings organized within EC
- Adoption of new measures recommended by other tools
- Level progress (badges, colors, benefits...)
- Contribution to investment and generation



ECOOP (RDIUP)

The Landing is a central Gateway platform where all Masterpiece tools will be available for the user access.

Frontend Auth - code grant flow



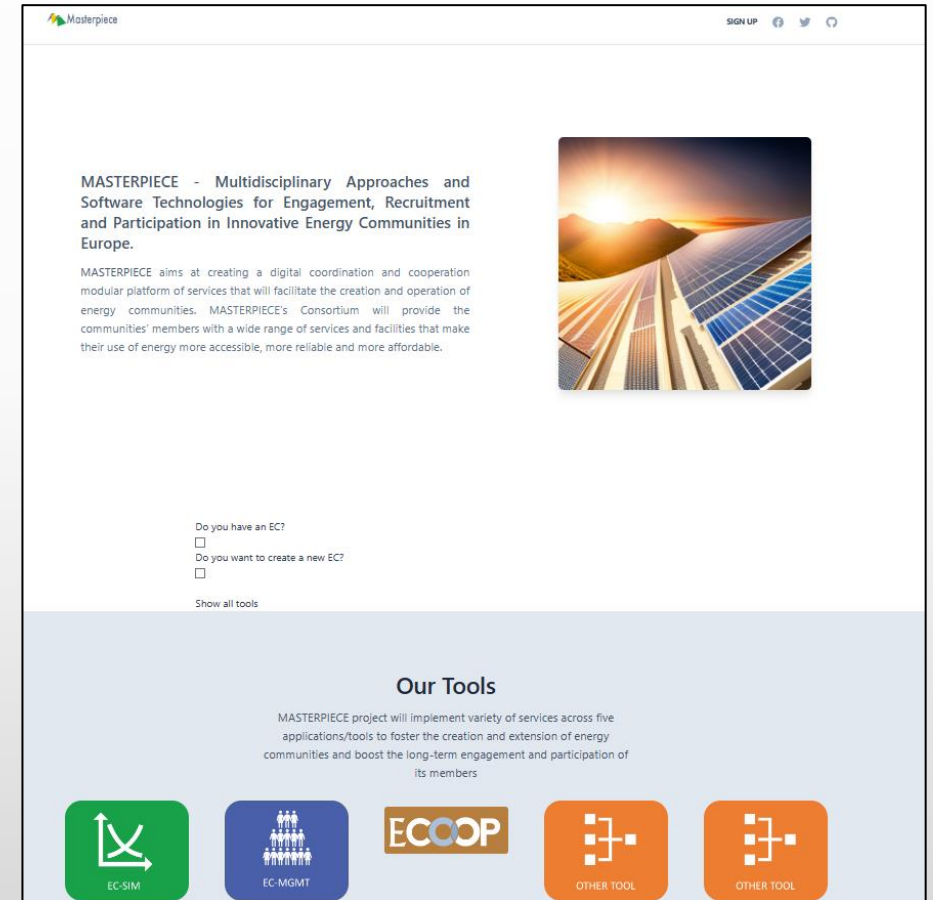
Backend Auth - Credentials flow

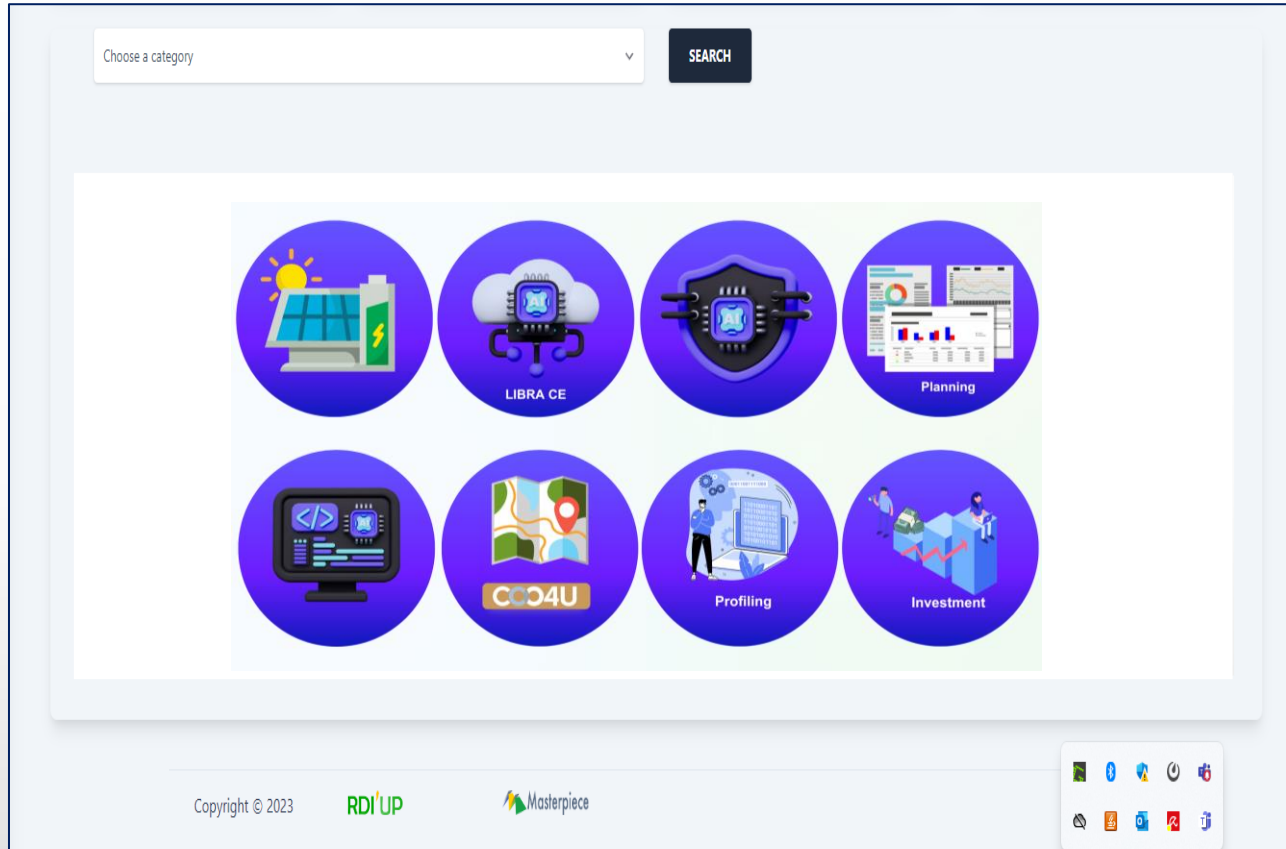


The UI shows an overview of the Masterpiece tools and Project and Dropsonw for Signup / Login via keycloak

It allows to unify the user management of tools and provides a central Access to all Masterpiece actors.

It will offer a quiz-based support to recommend tools based on the pilot maturity





ECOOP (RDIUP)

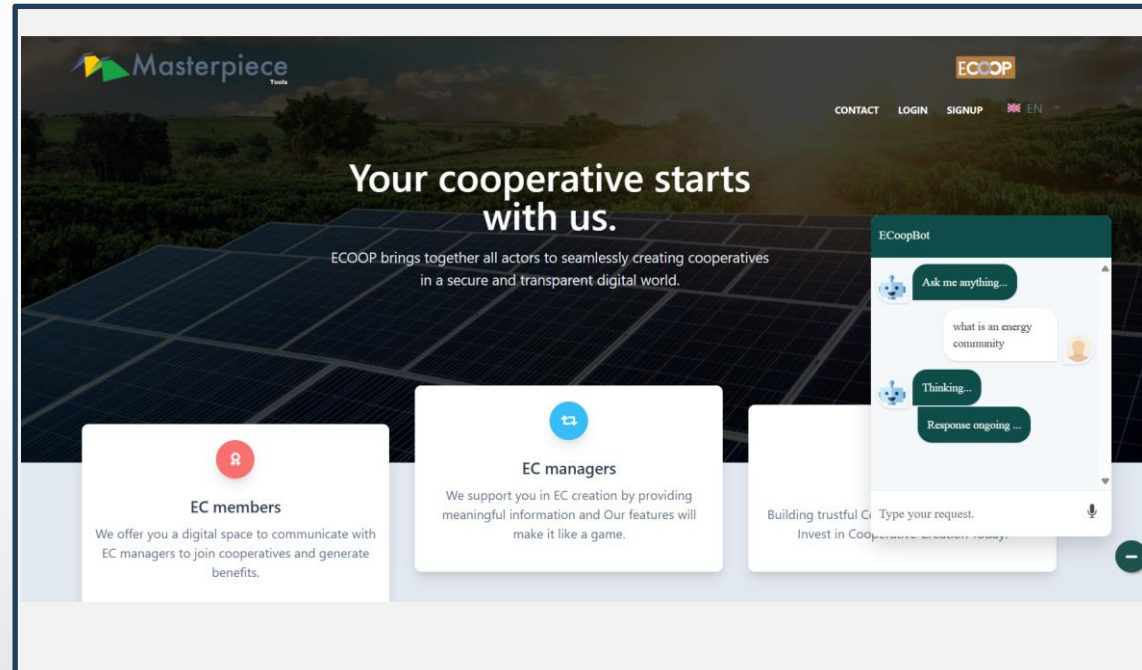
Roadmap:

Add a quiz to support users identifying the needed tools based on maturity level of the EC

Unify the user management via keycloak

Add privacy policy and term of conditions

Add the tools one by one in the Landing page



Next steps:

- Finish the integration of CO2 footprint algorithm
- Connect ECOOP to other Masterpiece tools
- Improve UX
- Finalize the integration of keycloak
- Finish the Mobile version of the ECOOP
- Integrate the leveling and rewarding system



**Multidisciplinary Approaches and Software Technologies for Engagement, Recruitment
and Participation in Innovative Energy Communities in Europe**

Any Questions ? Collaborations ?

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This project has received funding from the European Union's Horizon Framework Programme for Research and Innovation under grant agreement no 101096836.

Smart Tools for Smart Buildings: Enhancing the intelligence of buildings in Europe – Smart²

Sustainable Places 2024

Project Overview

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

1. Introduction – The Smart Square Project – Administrative Data

ADMINISTRATIVE DATA

★ Reference: LIFE21-CET-SMARTREADY-SMART-SQUARE/101077241

★ Acronym: LIFE21-CET-SMARTREADY-SMART SQUARE

🕒 Start Date: 01/10/2022

🕒 End Date: 30/09/2025

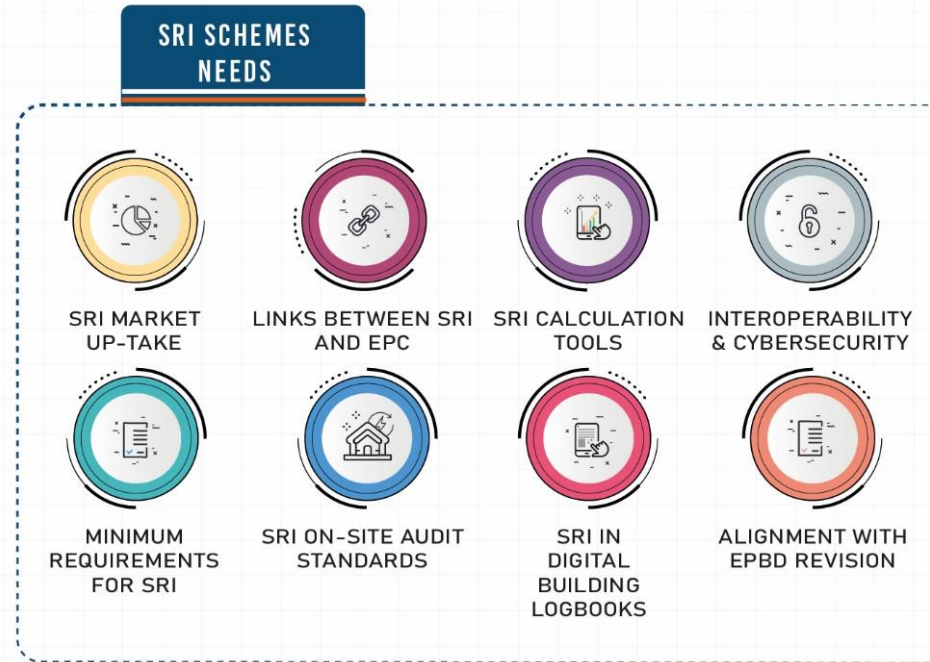
€ Total Eligible Budget: 2,047,124 €

🇪🇺 EU Contribution: 1,944,768 €

1. Introduction – The Smart Square Partners

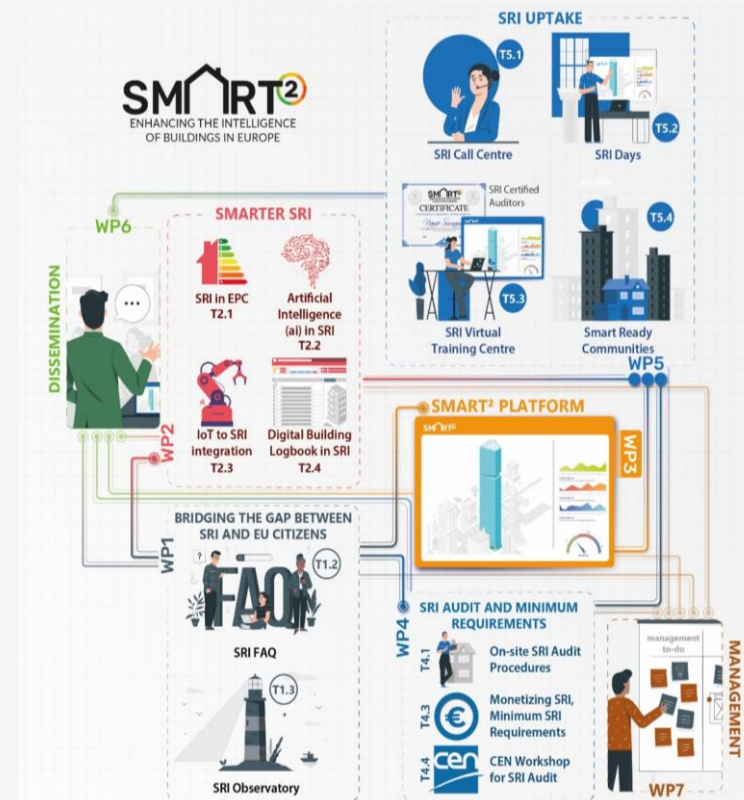


1. Introduction – Needs and Challenges of the Field

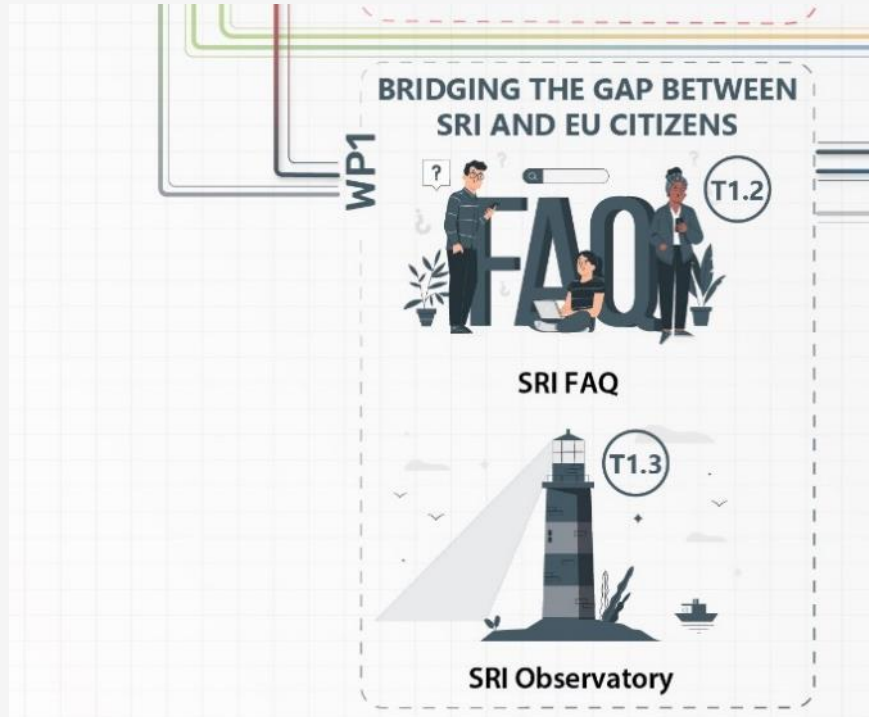


1. Smart² Proposition – How are the challenges addressed

1. Bridging the Gap between the SRI and the Society
2. Development of Tools and Solutions
3. SRI On Site Audits – Minimum Requirements
4. Demonstration Activities – Scheme Uptake



Smart² - Bridging the gap between SRI and EU citizens



- Development of the SRI for Dummies initiative
- Establishment of the SRI Observatory – Annual SRI Outlook for 2023, 2024 and 2025

Smart² - Bridging the gap between SRI and EU citizens

SRI FAQ Guide

Find here the answer to common questions about SRI.

This FAQ site is part of the Smart Square project, which aims to develop and deliver the appropriate tools and applications to enable the promotion and establishment of intelligence assessment of buildings in Europe, through the SRI scheme.

Find Categories from here...

- | | | |
|--|--|--------------------------|
| ▶ Definition | ▶ Benefits | ▶ Obstacles & challenges |
| ▶ Complexity | ▶ Mandatory | ▶ Calculation |
| ▶ Assessment | ▶ Assessor | ▶ Methodology |
| ▶ Users | ▶ Certification | ▶ Building types |
| ▶ Building performance & energy efficiency | ▶ Climate zones | ▶ Domains |
| ▶ Programs & Incentives | ▶ Availability & implementation in Member States | ▶ Documentation & tools |
| ▶ Energy companies / other companies | ▶ Devices | ▶ Regulation |


Still need help?

Contact us via the form below or via info@cyric.eu for further assistance, ask additional questions which are not yet covered and explained on this page, or provide valuable feedback related to the SRI.

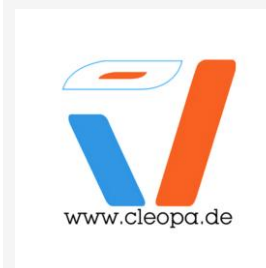
We're happy to support!

IMPRINT

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 Ust-Ident-Nummer DE 196571782

 Co-funded by the European Union

Funded by the European Union, under the Grant Agreement N° 101077241

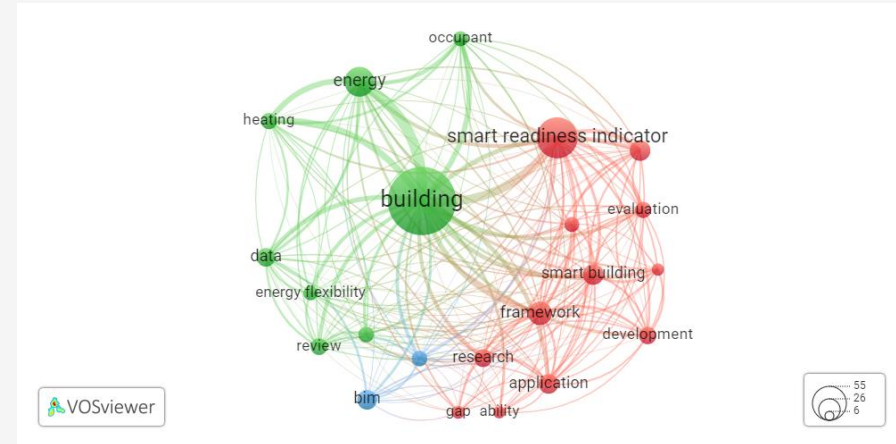
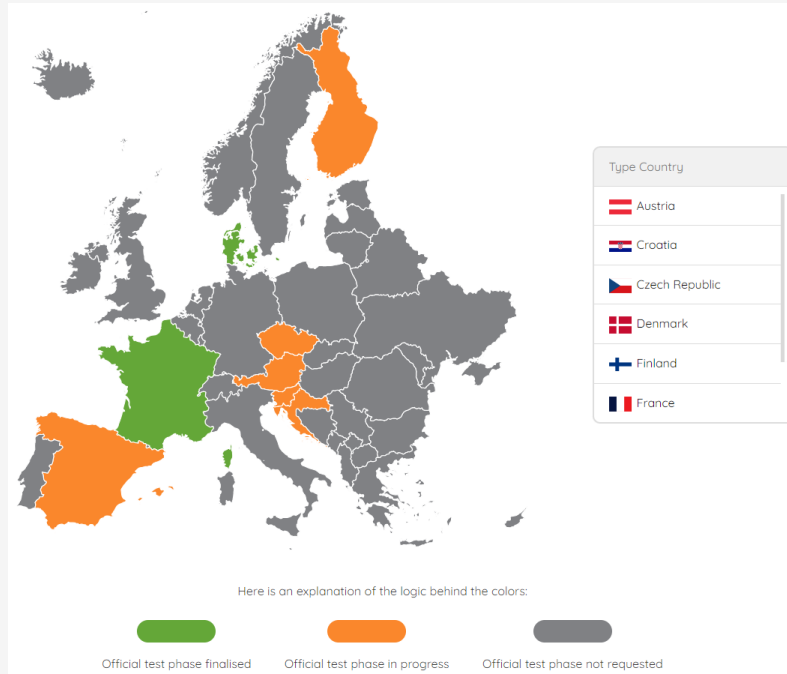


<https://sri-faq.eu/>

Smart² - Bridging the gap between SRI and EU citizens

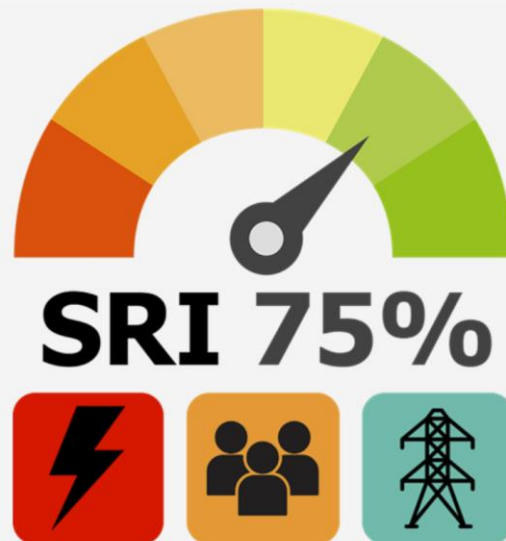


Smart² - Bridging the gap between SRI and EU citizens



- Transposition and Research Trackers

Smart² - Development of Tools and Solutions



How smart ready is your building? 🤖

The Smart readiness indicator (SRI) is a common EU scheme for rating the smart readiness of buildings.
The smart readiness indicator rating depends on a building's capacity to accommodate smart-ready services.



Welcome to Smart² platform! 🤖

Please sign-in to your account and start the adventure

EMAIL

PASSWORD


[Forgot Password?](#)

☐ Remember me?

Sign in


New on our platform? [Create an account](#)

Smart² - Development of Tools and Solutions

🇬🇧 👤 Logged in

[Home](#) [Assessment](#) [Call Centre](#) [Dashboard](#) [Contact Us](#)

Welcome to Smart² platform! [Start Tutorial](#)



Documentation

Click the button below to download the user guide.


Last updated 3 days ago


[Download](#)

Getting started

Click the button below for video tutorials.

Last updated 3 days ago

[Tutorials](#)



What makes a building smart

Advantages

The 'smartness' of a building refers to its ability to sense, interpret, communicate and actively respond in an efficient manner to changing conditions in relation to:


- The operation of technical building systems
- The external environment (including energy grids),
- Demands from building occupants.

The SRI rates the smart readiness of buildings (or building units) in their capability to perform 3 key functionalities:


- Optimise energy efficiency and overall in-use performance,
- Adapt their operation to the needs of the occupant,
- Adapt to signals from the grid (for example, energy flexibility).

The SRI will raise awareness of the benefits promised by smart building technologies, such as building

History of the SRI

**First SRI technical study for the EC:** 2017,2018

Definition of the SRI and draft methodology. Intensive stakeholder consultation.

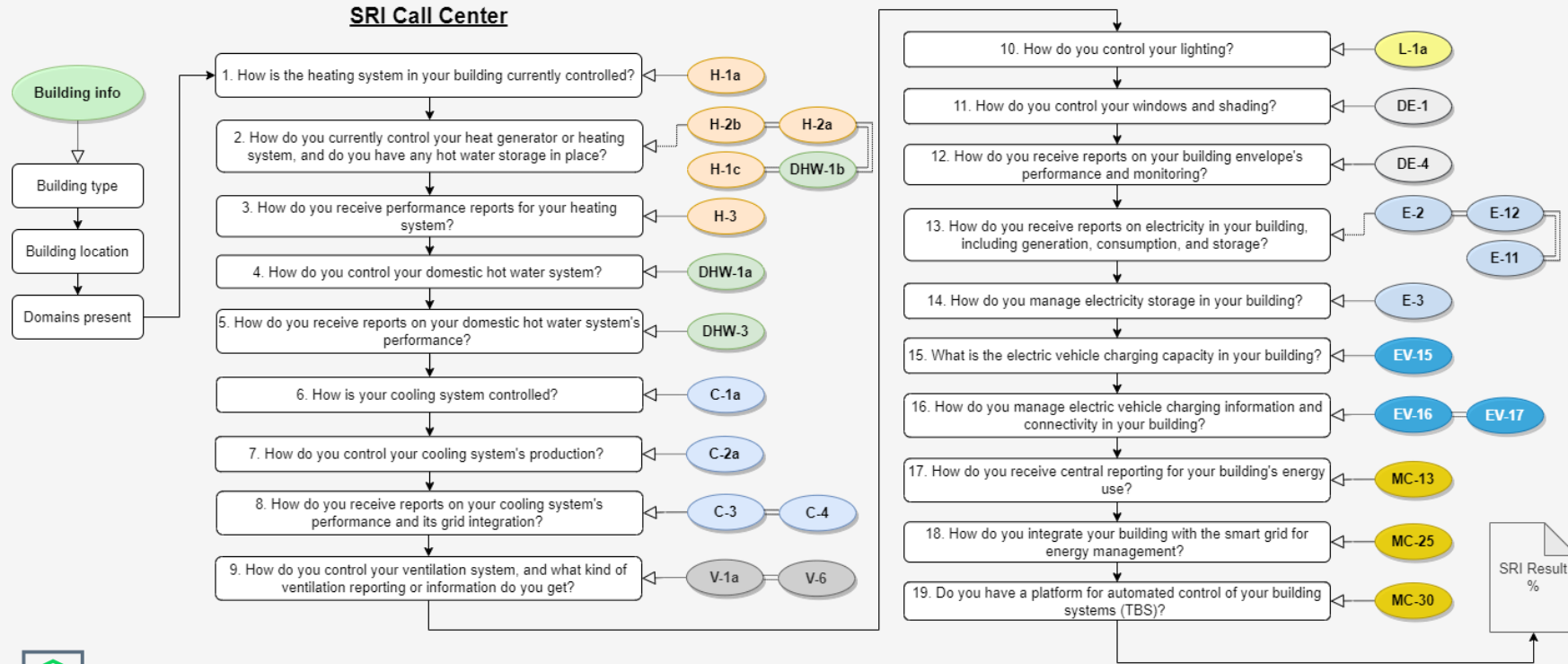
**Introduction** 2018

Introduction of the SRI in the 2018 revision of the EPBD as an optional scheme.

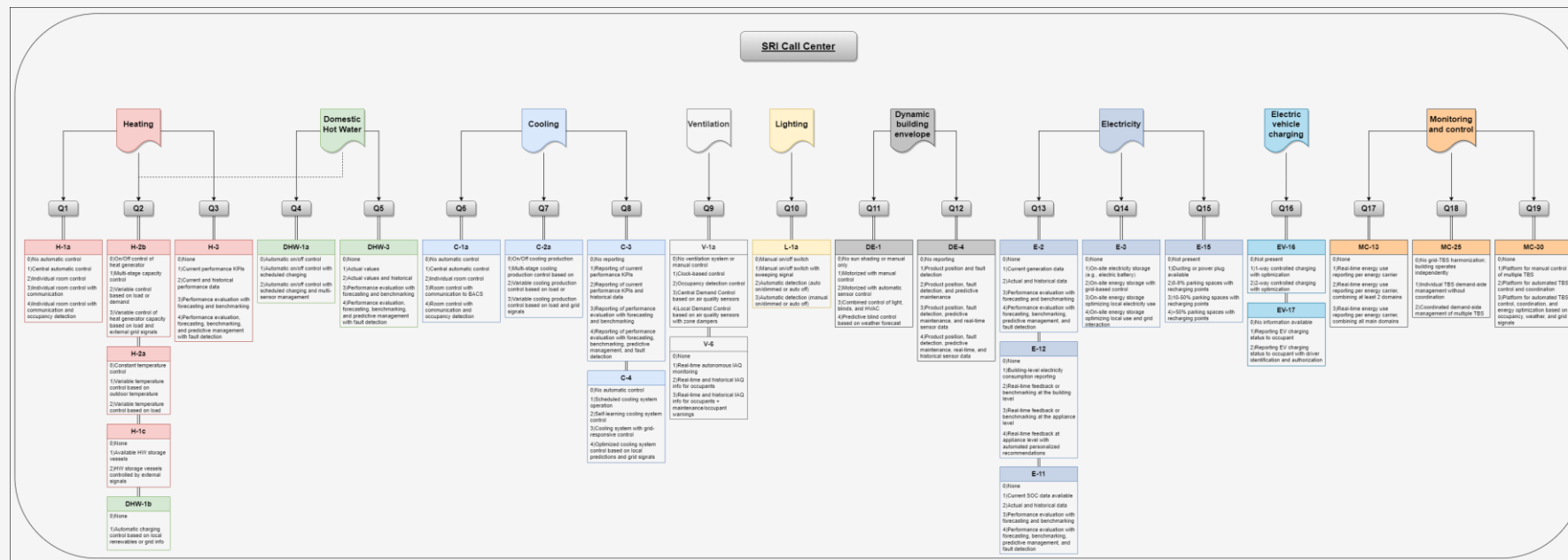
Smart² - Development of Tools and Solutions



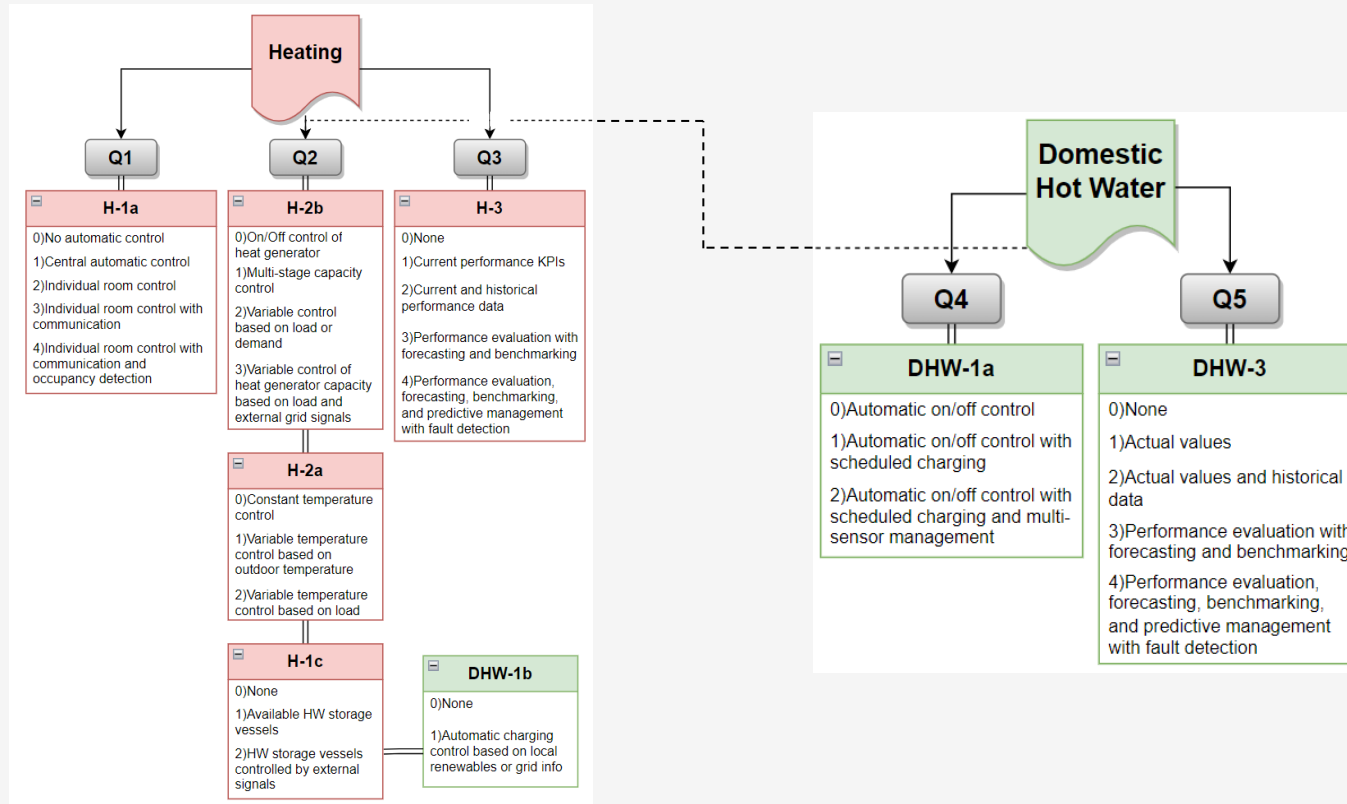
Smart² - Development of Tools and Solutions



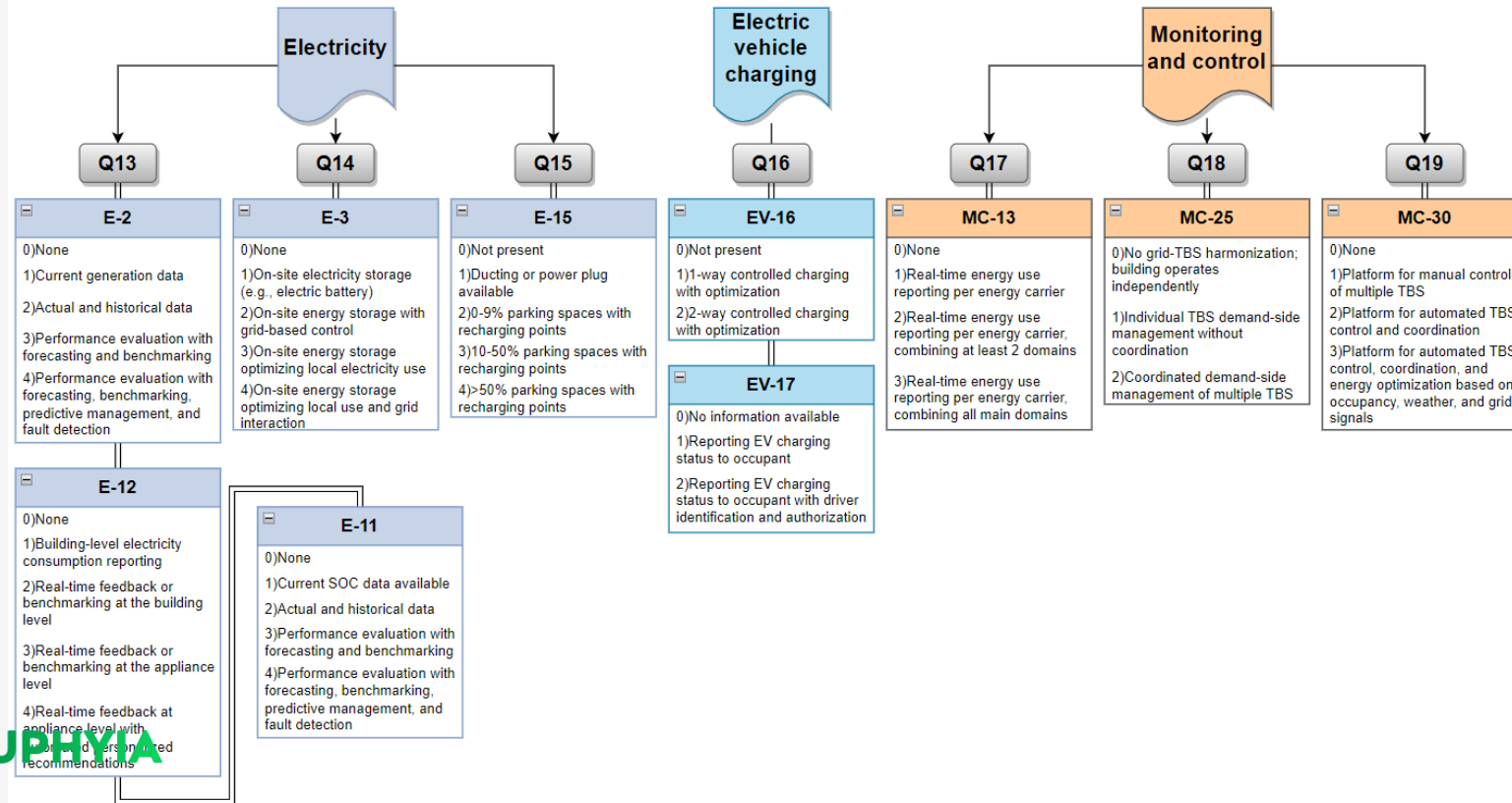
Smart² - Development of Tools and Solutions



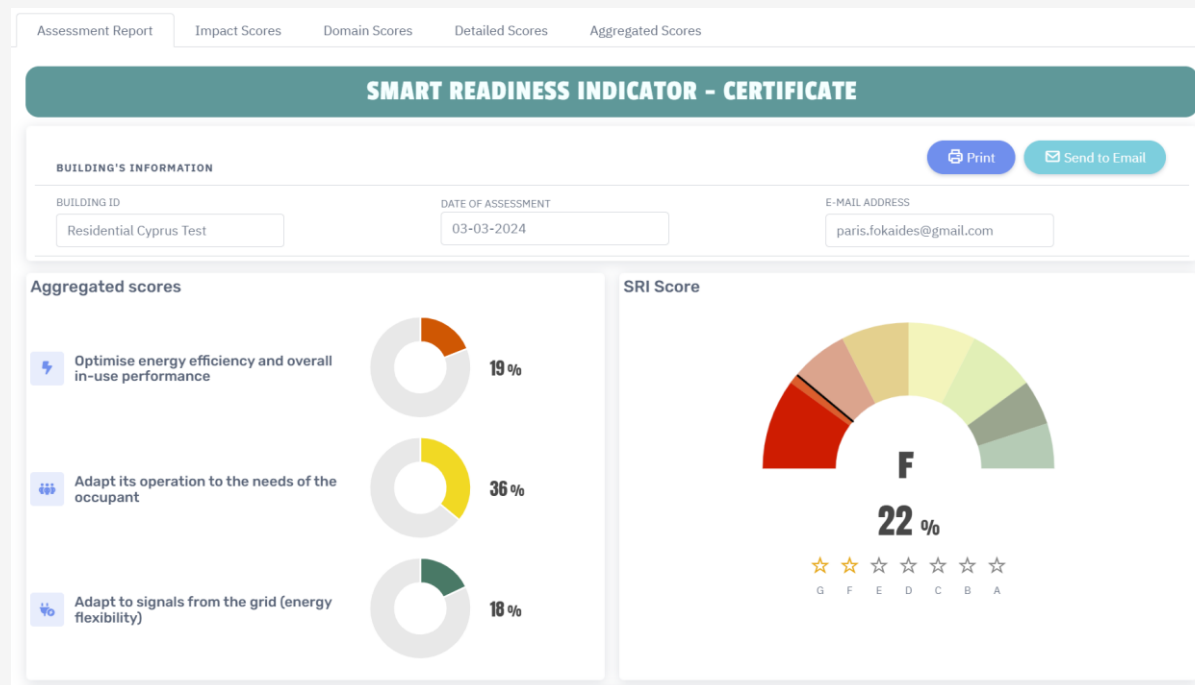
Smart² - Development of Tools and Solutions













Smart² - Development of Tools and Solutions



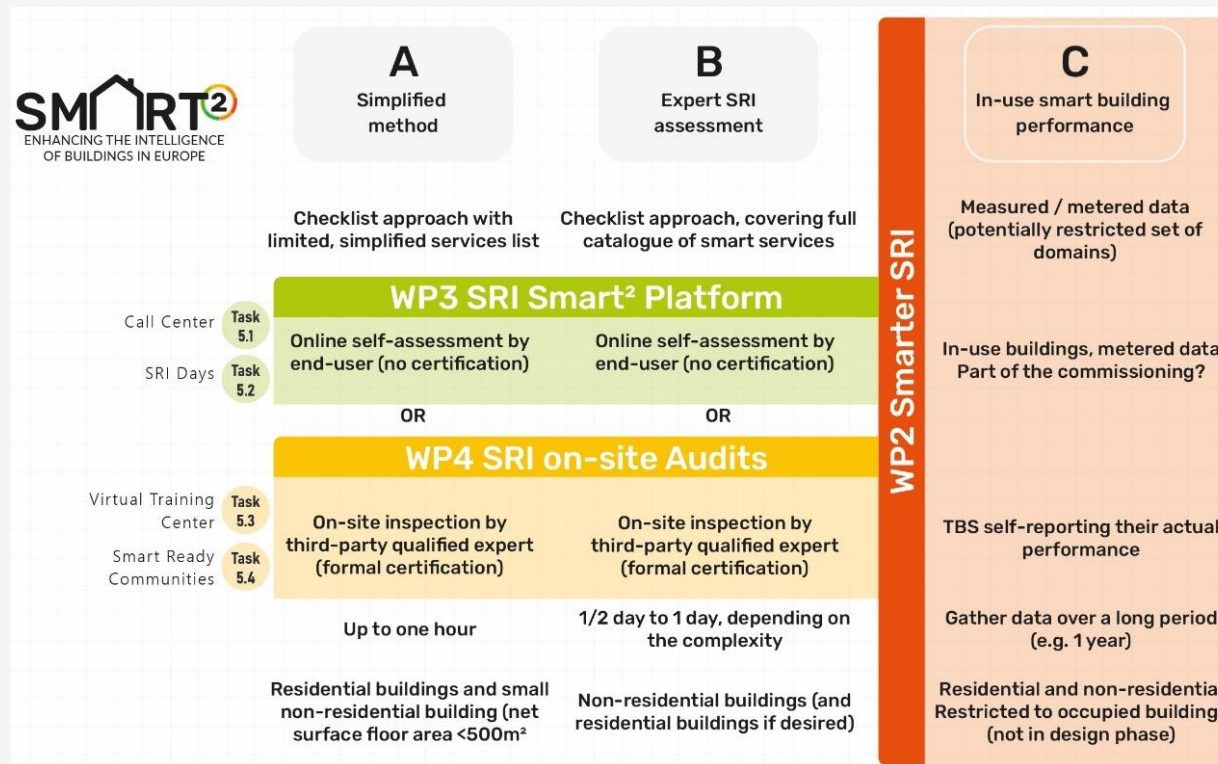
Smart² - Development of Tools and Solutions



Smart² - Development of Tools and Solutions

								
	Energy efficiency	Maintenance & fault prediction	Comfort	Convenience	Health & well-being	Information to occupants	Energy flexibility & storage	SRI
Total	28 %	10 %	44 %	18 %	60 %	20 %	18 %	22 %
 Heating	30 %	33 %	43 %	20 %	50 %	0 %	0 %	
 DHW	20 %	25 %	0 %	20 %	0 %	0 %	0 %	
 Cooling	38 %	17 %	43 %	29 %	67 %	0 %	0 %	
 Ventilation	0 %	0 %	0 %	0 %	0 %	0 %	0 %	
 Lighting	33 %	0 %	50 %	50 %	0 %	0 %	0 %	
 DE	0 %	0 %	0 %	0 %	0 %	0 %	0 %	
 Electricity	20 %	0 %	0 %	0 %	0 %	17 %	33 %	
 EV	0 %	0 %	0 %	0 %	0 %	0 %	0 %	
 M&C	25 %	0 %	0 %	14 %	0 %	25 %	33 %	

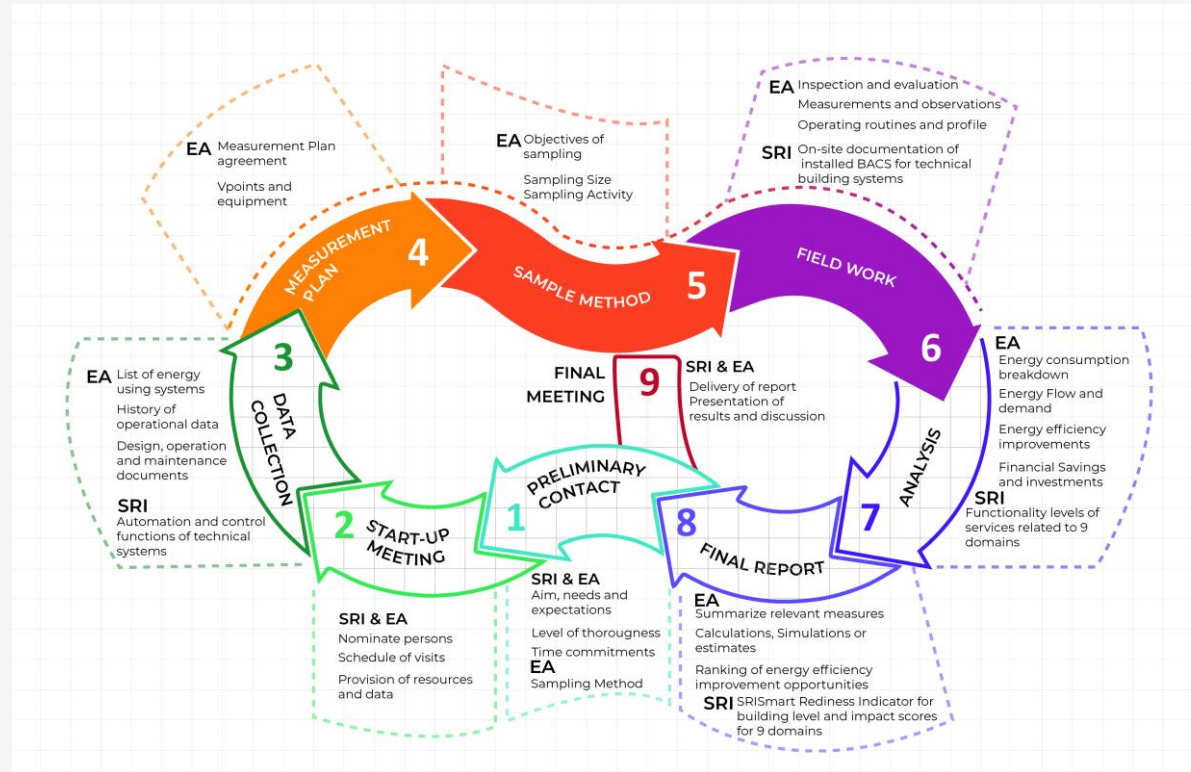
Smart² - Development of Tools and Solutions



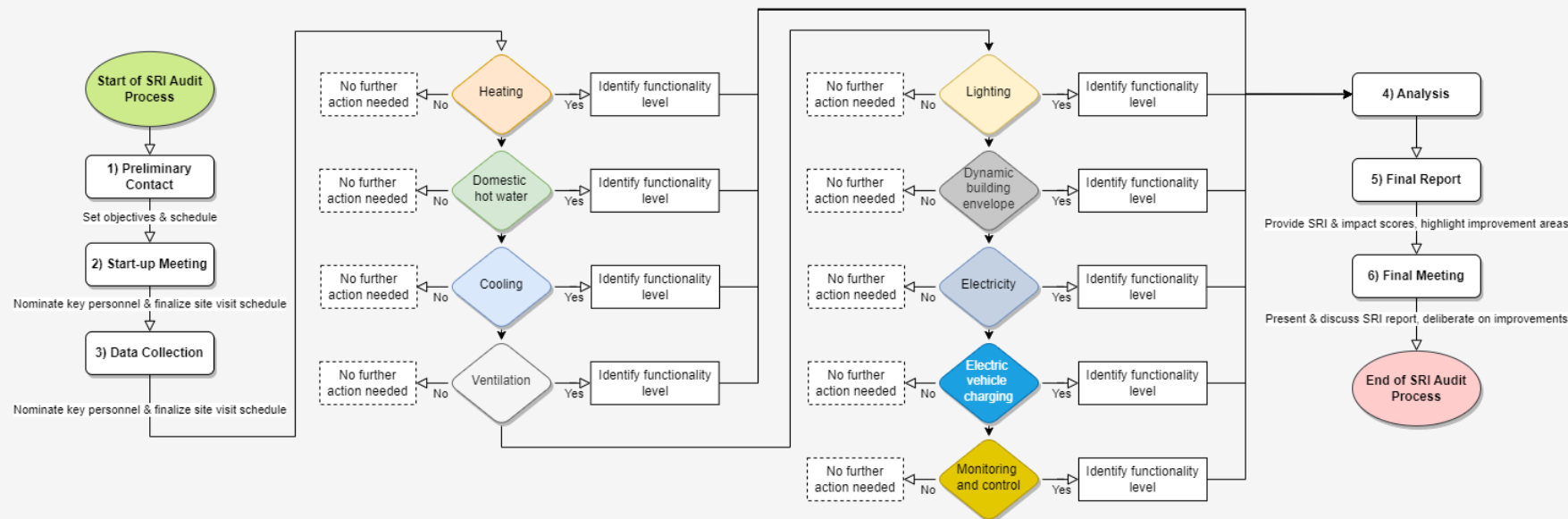
Smart² - SRI on-site audits and minimum requirements



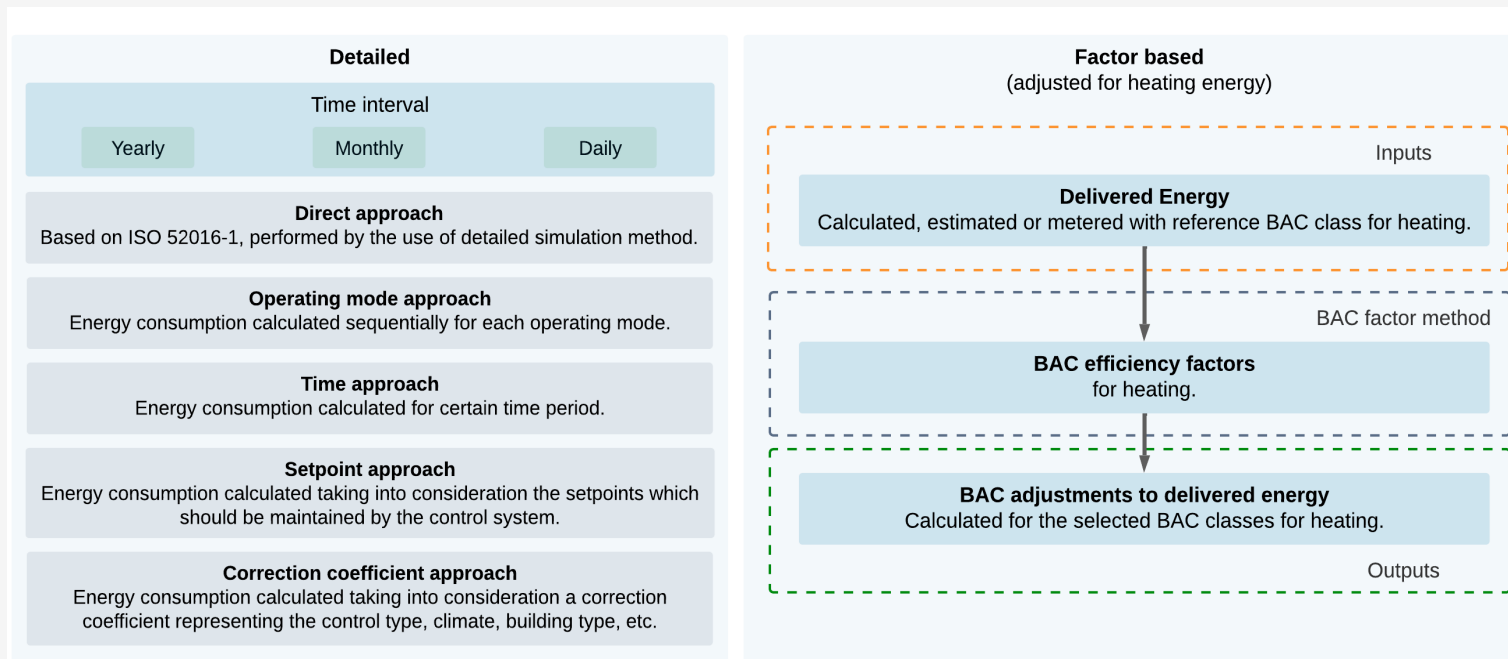
Smart² - SRI on-site audits and minimum requirements



Smart² - SRI on-site audits and minimum requirements



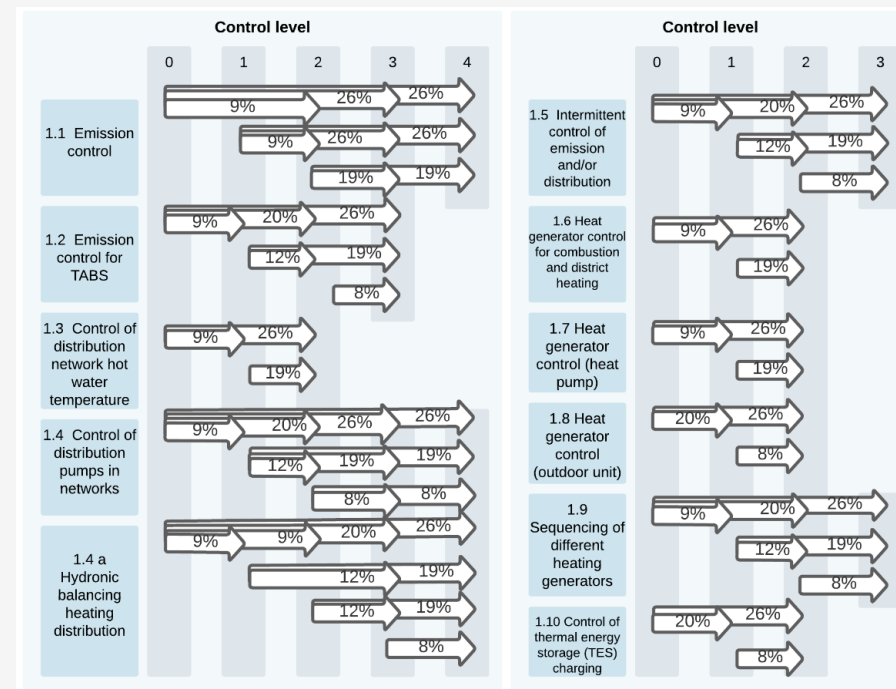
Smart² - SRI on-site audits and minimum requirements



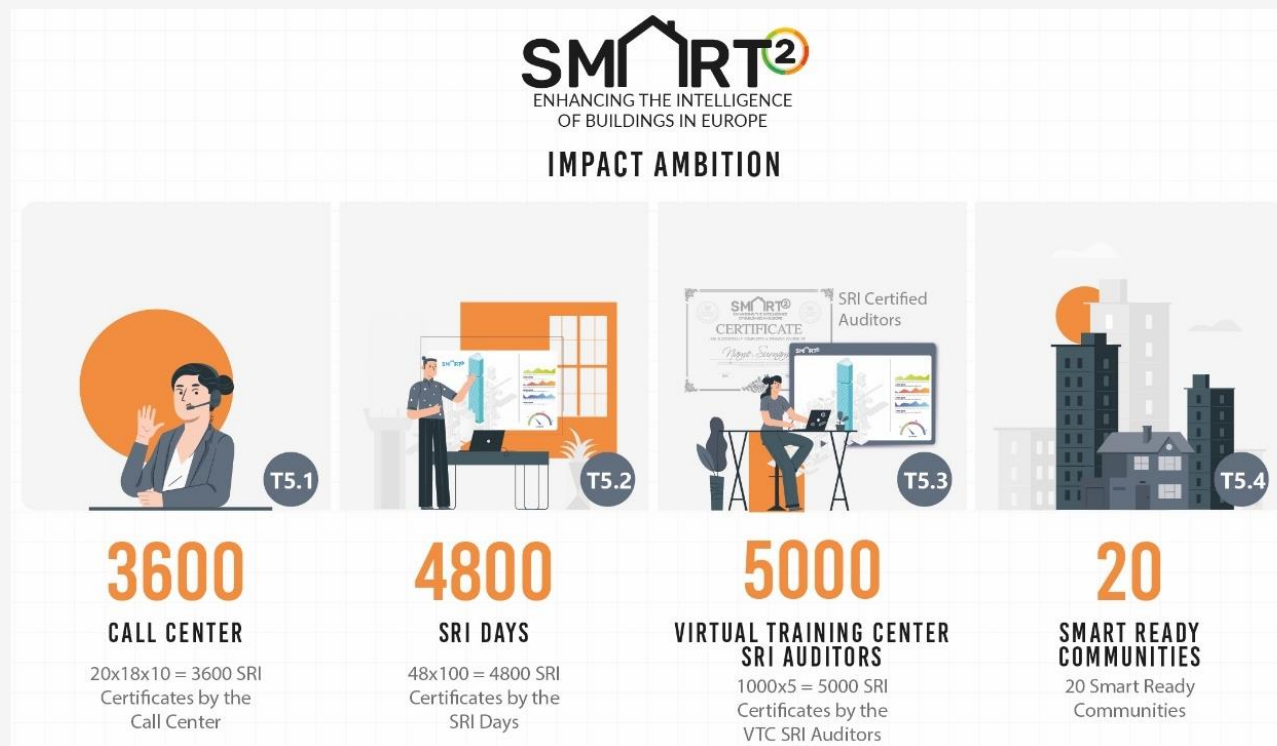
Smart² - SRI on-site audits and minimum requirements

1.1 Emission control	0 D	1 D	2 C	3 B	4 A
1.2 Emission control for TABS	0 D	1 C	2 B	3 A	
1.3 Control of distribution network hot water temperature	0 D	1 C	2 A		
1.4 Control of distribution pumps in networks	0 D	1 C	2 B	3 A	4 A
1.4 a Hydronic balancing heating distribution	0 D	1 C	2 B	3 A	4 A
1.5 Intermittent control of emission and/or distribution	0 D	1 C	2 B	3 A	
1.6 Heat generator control for combustion and district heating	0 D	1 C	2 A		
1.7 Heat generator control (heat pump)	0 D	1 C	2 A		
1.8 Heat generator control (outdoor unit)	0 D	1 B	2 A		
1.9 Sequencing of different heating generators	0 D	1 C	2 B	3 A	
1.10 Control of thermal energy storage (TES) charging	0 D	1 B	2 A		

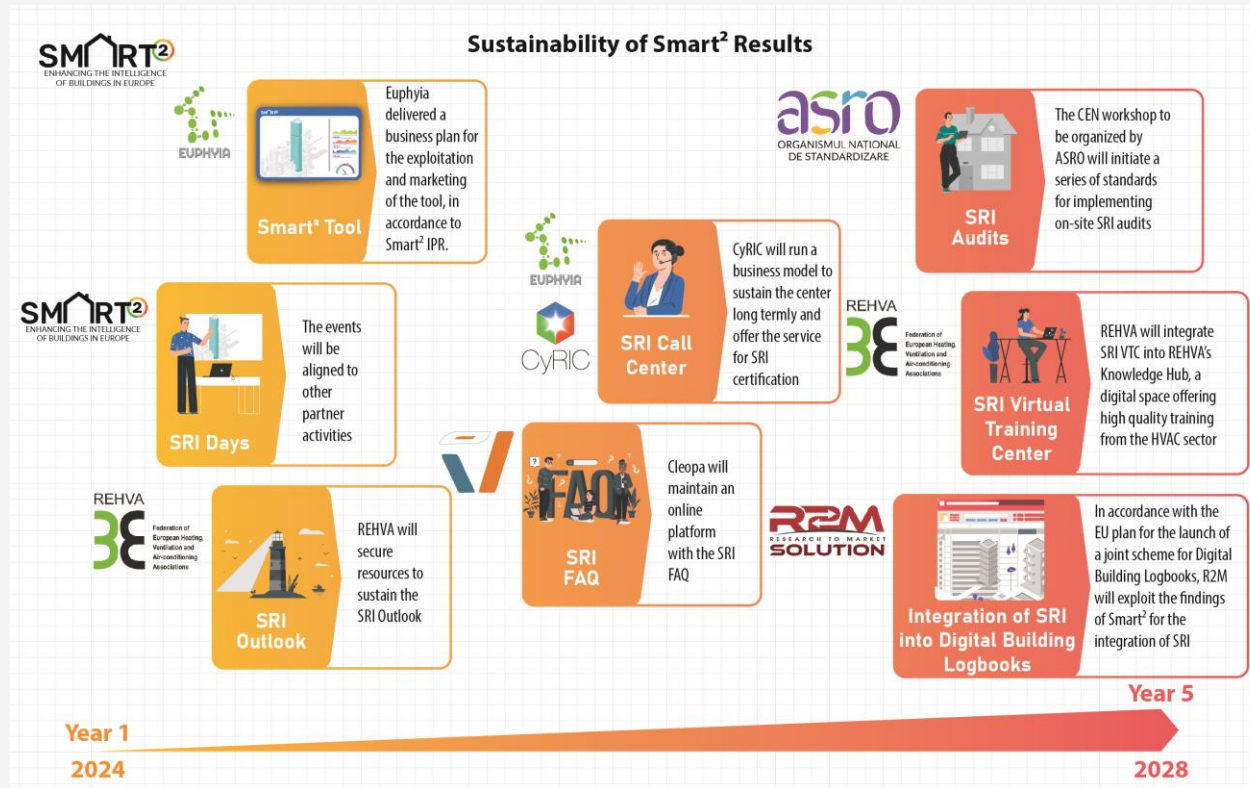
Legend: Level of Control
BAC class



Smart² Demonstration activities – Scheme Uptake

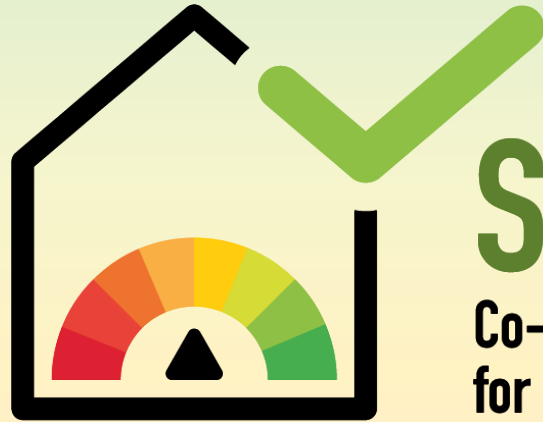


Smart² Sustainability of Project Results



Q+A Session

Dr.-Ing- Paris A Fokaides
Euphyia Tech
Technical and Scientific Manager
paris@euphyia-tech.com



SRI-ENACT

Co-creating Tools and Services
for Smart Readiness Indicator Uptake

SRI-ENACT Toolkit

SRI Assessment Tool & Decision Support Tool

24/09/2024

Apostolos Arsenopoulos (NTUA)

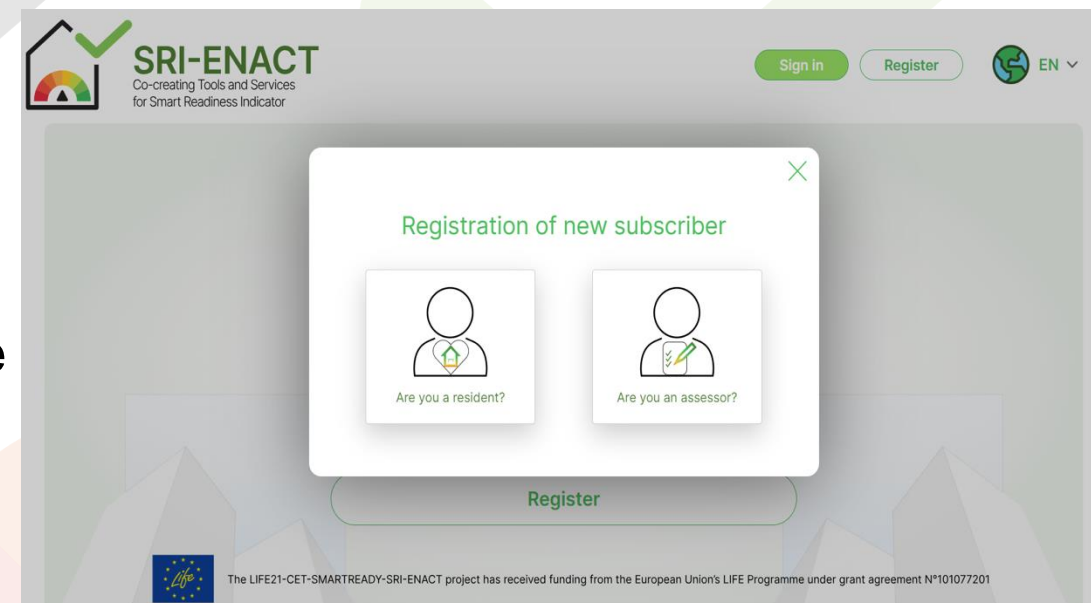
SRI-ENACT Toolkit – Overview

- SRI-ENACT toolkit is accessible under the url: <https://www.srienact-tool.eu/>
- SRI-ENACT toolkit includes:
 - ✓ Assessment tool that implements the SRI methodology
 - ✓ Decision support tool for supporting decisions regarding the smart-ready upgrades
- SRI-ENACT toolkit offers different user roles:
 - ✓ Resident, assessor, supervisor/administrator providing different access policies and views of the SRI assessment at national or EU level

SRI-ENACT Toolkit – Registration Process

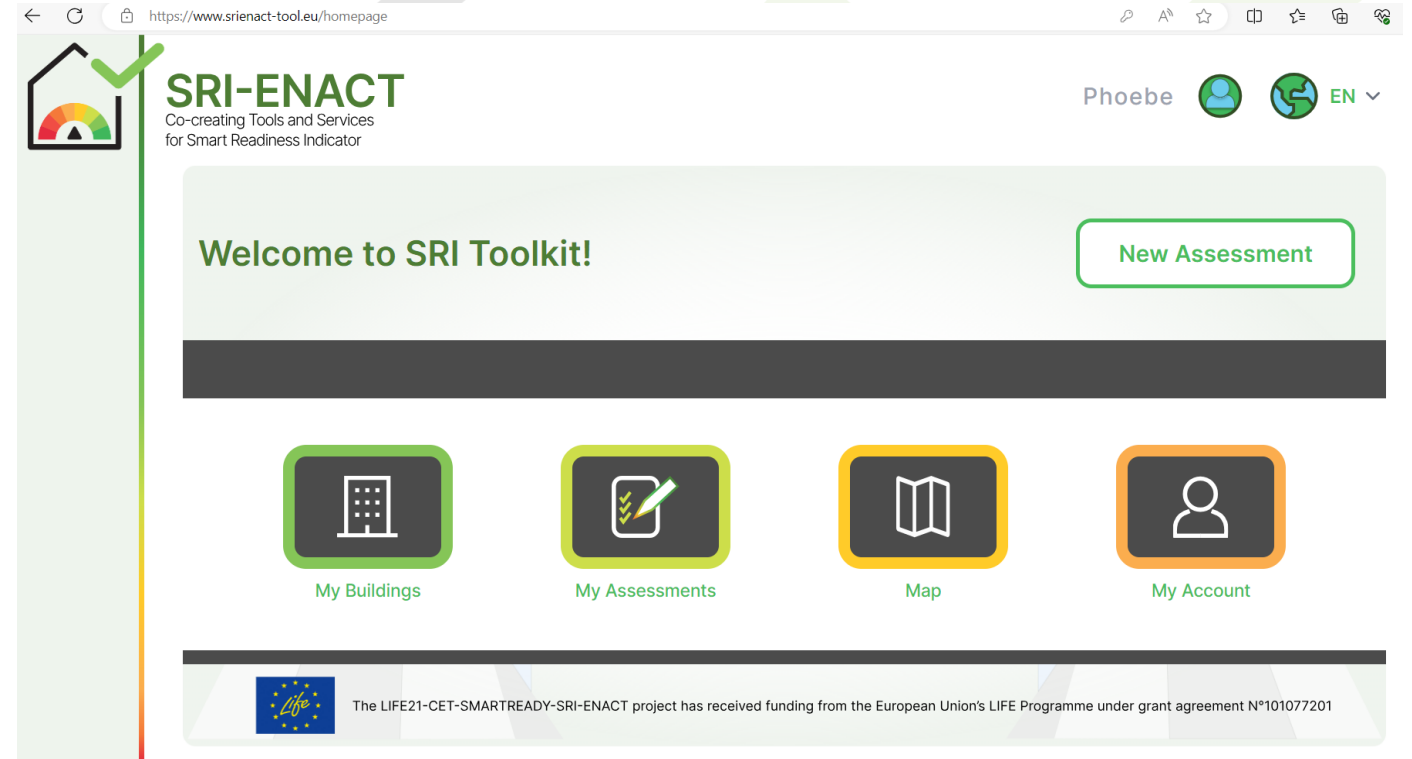
- Two options for registration:
 - ✓ Register as **resident**: Registration is open for the general public
 - ✓ Register as an **assessor**: Registration is controlled by the SRI-ENACT administrator. It requires first that the assessor is added by the administrator in assessor's registry.
- In both options, email verification is required to activate your account

- ! As a resident, the user will also be able to conduct assessments
- ! Only certified SRI-ENACT “assessors”, who will participate in the pilot activities will be granted access to the tool as assessors in the system



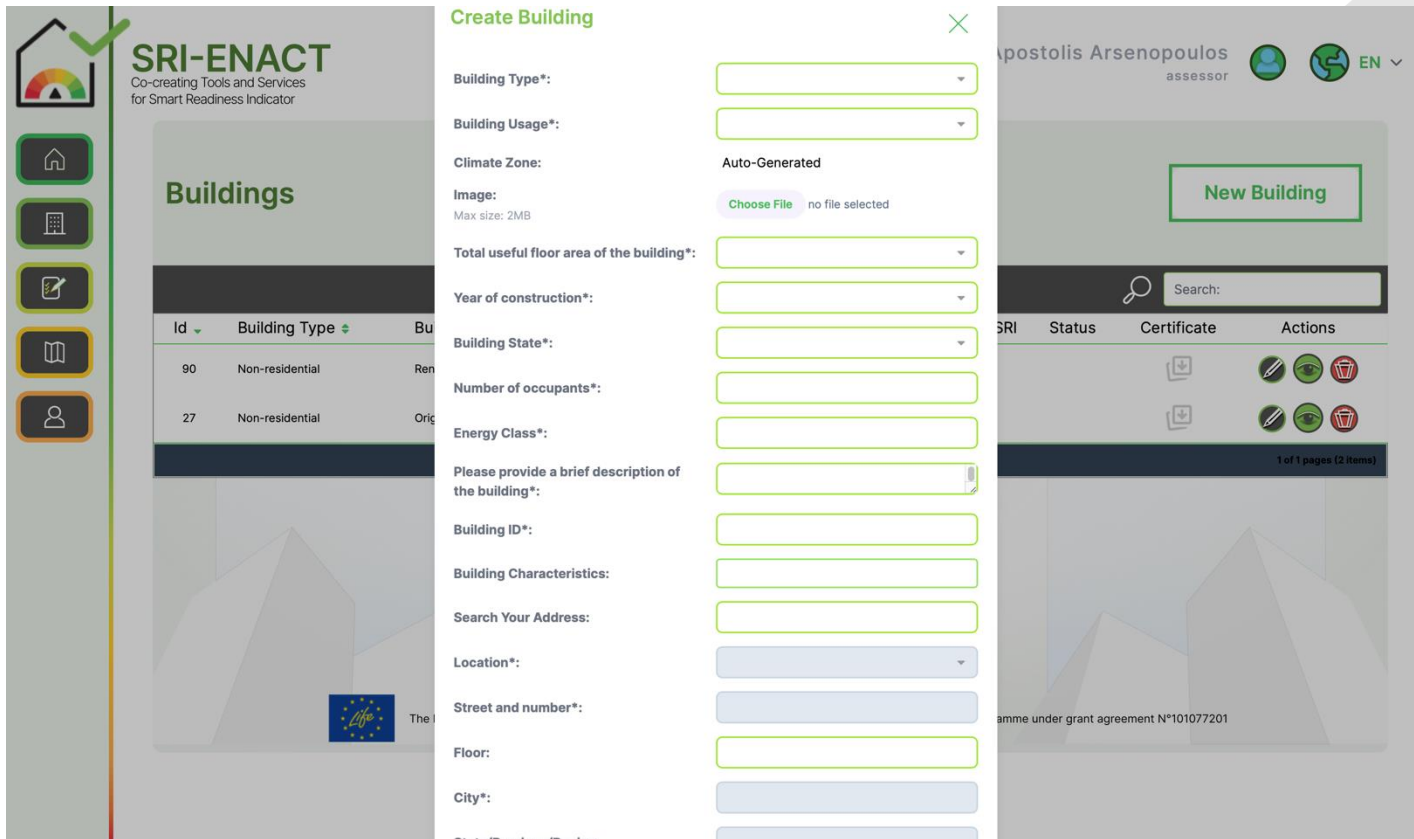
SRI-ENACT Toolkit – Menu

- **My Buildings:** Create new buildings and store them for later use
- **My Assessments:** View, access all your assessments
- **Map:** View your building assessments in Google maps
- **My Account:** Manage your account



SRI-ENACT DST is not directly accessible from the menu; It is only accessible after the completion of an SRI assessment

SRI-ENACT Assessment Tool – Assessment Workflow (1/5)



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

Buildings

Id	Building Type	Usage
90	Non-residential	Ren
27	Non-residential	Orig

Create Building

Building Type*:

Building Usage*:

Climate Zone: Auto-Generated

Image: Choose File no file selected
Max size: 2MB

Total useful floor area of the building*:

Year of construction*:

Building State*:

Number of occupants*:

Energy Class*:

Please provide a brief description of the building*:

Building ID*:

Building Characteristics:

Search Your Address:

Location*:

Street and number*:

Floor:

City*:

State/Province/Country:

New Building

Search:

SRI Status Certificate Actions

1 of 1 pages (2 items)

programme under grant agreement N°101077201

After clicking on “New Assessment”, you will be asked to select a building from “My buildings” or add a new Building (Google maps integrated to facilitate Building addition)

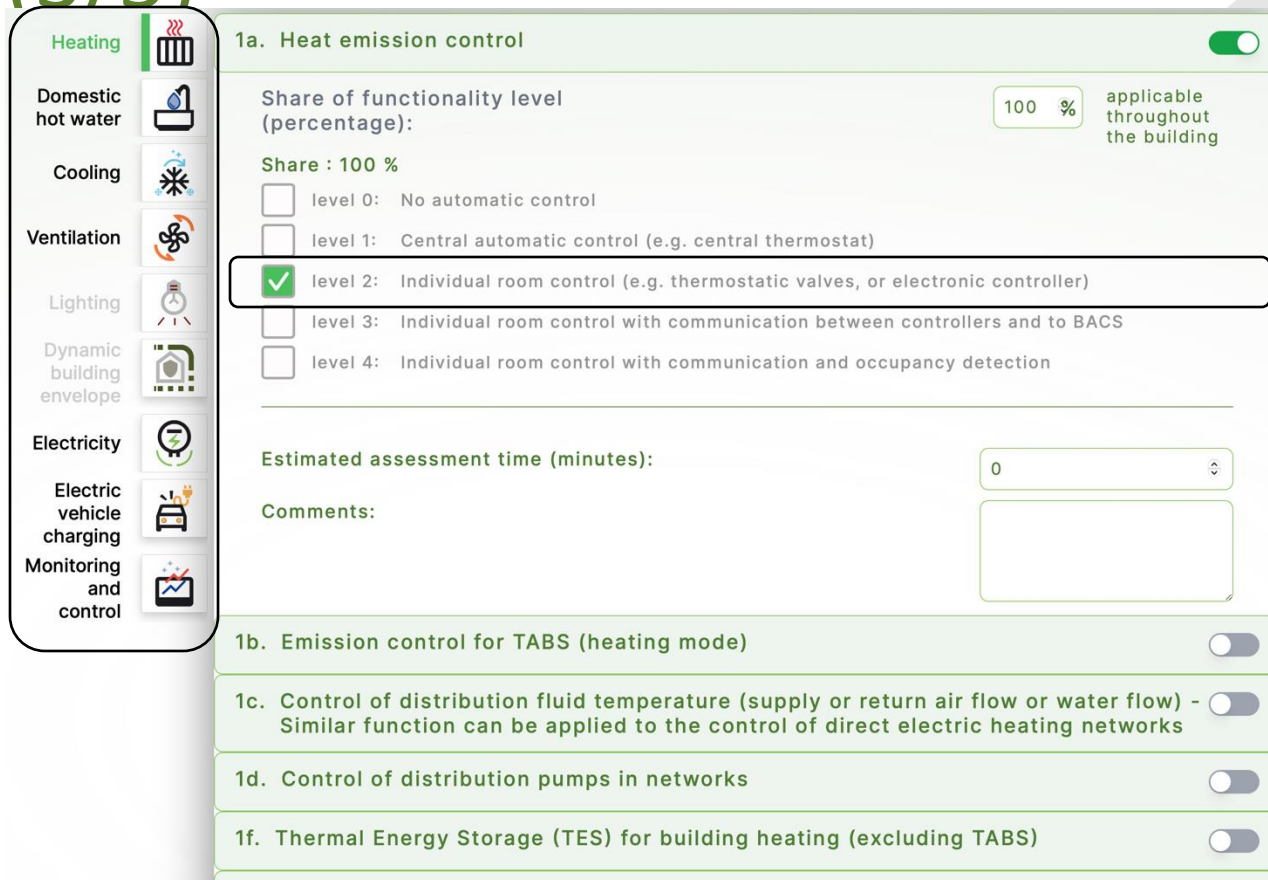
SRI-ENACT Assessment Tool – Assessment Workflow (2/5)





The screenshot shows the SRI-ENACT Assessment Tool interface. At the top, the user is logged in as 'Apostolis Arsenopoulos' with the role of 'assessor'. The interface includes a sidebar with navigation icons for Home, Buildings, Assessment, and Profile. The main content area displays a 'Preferred weightings *' and 'Preferred services catalogue *' section, both marked as 'auto-generated *'. Below this, a 'Domains present' section asks: 'Are the following technical building systems present in your building? If not, are they mandatory for new constructions in your country of residence?'. The domains listed are Heating, Domestic hot water, Cooling, Ventilation, Lighting, Dynamic building envelope, Electricity, Electric vehicle charging, and Monitoring and control. Each domain has a toggle switch for 'Is present' and a toggle switch for 'Is mandatory'. The 'Is present' toggle is turned on for all domains. The 'Is mandatory' toggle is turned on for 'Lighting' and 'Dynamic building envelope'. A 'Show Services' button is located at the bottom of the domains list. At the bottom of the interface, a footer states: 'The LIFE21-CET-SMARTREADY-SRI-ENACT project has received funding from the European Union's LIFE Programme under grant agreement N°101077201'.


Select present domains and Mandatory/Non mandatory in case of non-presence. Note that the Assessment method is pre-defined to Method B and cannot be modified by the assessor.


SRI-ENACT Assessment Tool – Assessment Workflow (3/5)





Heating 


Domestic hot water 


Cooling 


Ventilation 


Lighting 

Dynamic building envelope 

Electricity 

Electric vehicle charging 

Monitoring and control 

1a. Heat emission control 

Share of functionality level (percentage): applicable throughout the building

Share : 100 %

☐ level 0: No automatic control

☐ level 1: Central automatic control (e.g. central thermostat)


☒ level 2: Individual room control (e.g. thermostatic valves, or electronic controller)


☐ level 3: Individual room control with communication between controllers and to BACS


☐ level 4: Individual room control with communication and occupancy detection


Estimated assessment time (minutes):

Comments:

1b. Emission control for TABS (heating mode) 

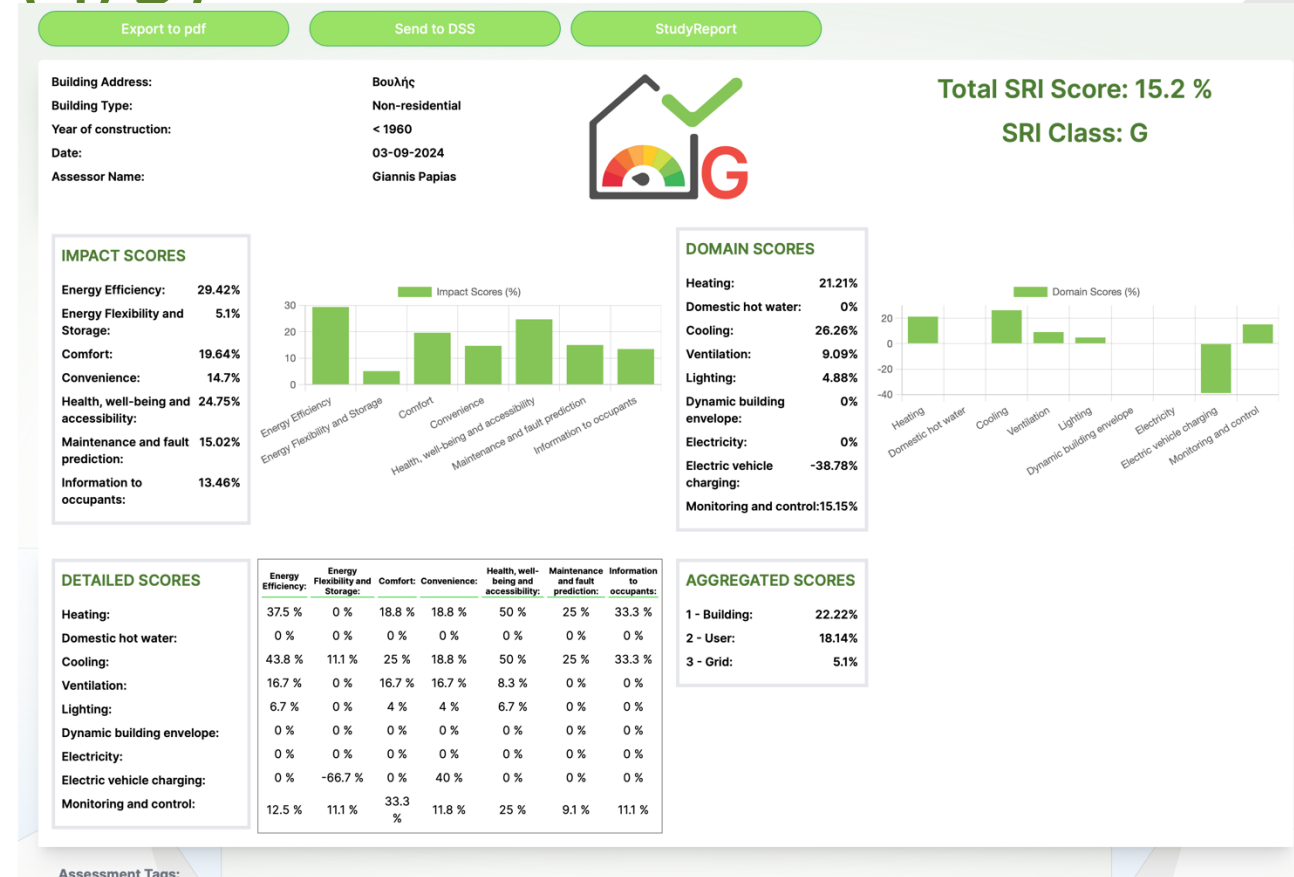
1c. Control of distribution fluid temperature (supply or return air flow or water flow) - Similar function can be applied to the control of direct electric heating networks 

1d. Control of distribution pumps in networks 

1f. Thermal Energy Storage (TES) for building heating (excluding TABS) 

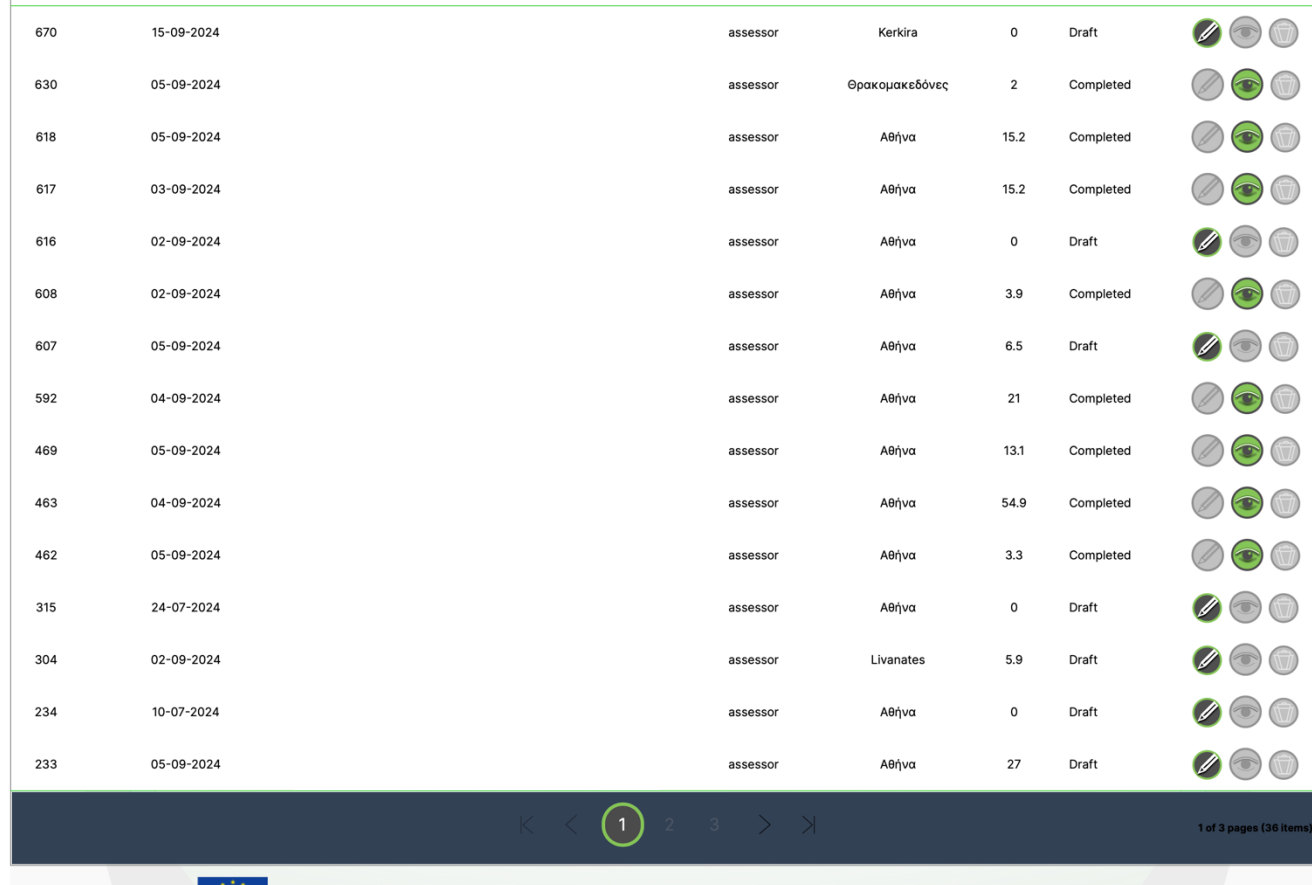
Select the domain from the menu on the left, and unfold the services. For each service, define the functionality level. Press “Confirm” to save your data and “clear” to restart. Once completed, press “Calculate SRI”










































SRI-ENACT Assessment Tool – Assessment Workflow (4/5)



View the output of your evaluation. At this stage, you can return back to refine/correct your assessment. Once, the evaluation is complete, press “Complete Assessment”. Press “Send to DSS” to access the SRI-ENACT DST.

SRI-ENACT Assessment Tool – Assessment Workflow (5/5)



670	15-09-2024	assessor	Kerkira	0	Draft	  
630	05-09-2024	assessor	Θρακομακεδόνες	2	Completed	  
618	05-09-2024	assessor	Αθήνα	15.2	Completed	  
617	03-09-2024	assessor	Αθήνα	15.2	Completed	  
616	02-09-2024	assessor	Αθήνα	0	Draft	  
608	02-09-2024	assessor	Αθήνα	3.9	Completed	  
607	05-09-2024	assessor	Αθήνα	6.5	Draft	  
592	04-09-2024	assessor	Αθήνα	21	Completed	  
469	05-09-2024	assessor	Αθήνα	13.1	Completed	  
463	04-09-2024	assessor	Αθήνα	54.9	Completed	  
462	05-09-2024	assessor	Αθήνα	3.3	Completed	  
315	24-07-2024	assessor	Αθήνα	0	Draft	  
304	02-09-2024	assessor	Livanates	5.9	Draft	  
234	10-07-2024	assessor	Αθήνα	0	Draft	  
233	05-09-2024	assessor	Αθήνα	27	Draft	  

1 of 3 pages (36 items)

Access your assessment in draft mode or after completion. Draft assessments can be deleted. Completed assessments cannot be modified and cannot be deleted.

Case study report



CASE STUDY



SMART READINESS INDICATOR (SRI)

The building:

Building information

EPC (Energy Performance Certificate)

-

Building type

Non-residential

Location

Βουλή

Surface area Construction year
10000-25000 m² < 1960

Specificities

The Hellenic Parliament building, completed in 1843 has housed the Hellenic Parliament since 1934. It is situated at the heart of Athens, facing onto Syntagma Square.

Building image



Main technical characteristics:

- Office Spaces
- Public Spaces
- Variable Refrigerant Volume (VRV)
- Three-Way Valve Control
- BMS Integrated
- Cooling Tower Integration
- Fan Coil Units
- Water Chillers

OUTCOMES OF THE SRI ASSESSMENT:

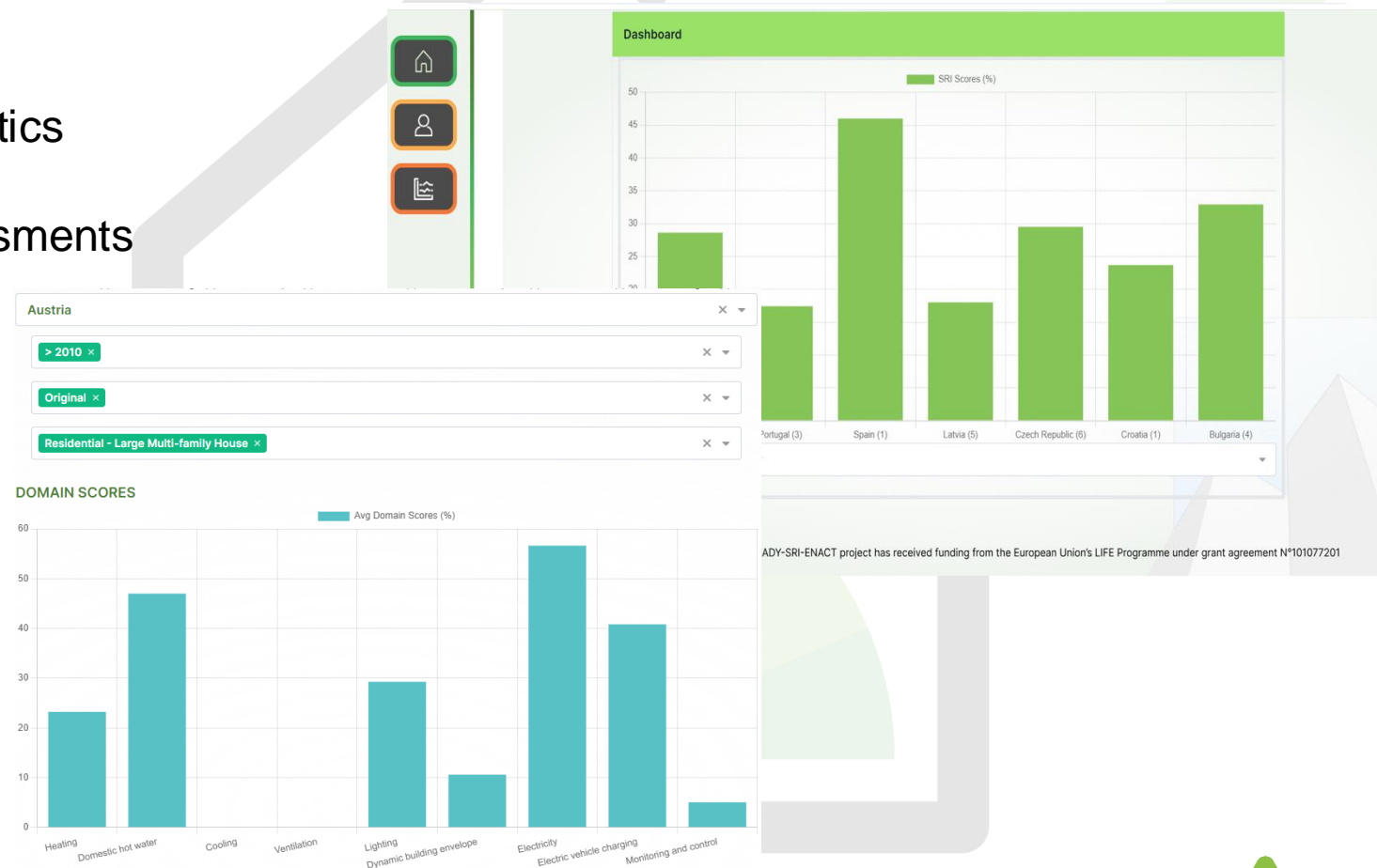
OVERALL SCORE
15.2%

SCORES PER IMPACT CRITERIA:

Domain	Score
Energy Efficiency	29.42%
Energy Flexibility and Storage	5.1%
Comfort	19.64%
Convenience	14.7%
Health, well-being and accessibility	24.75%
Maintenance and fault prediction	15.02%
Information to occupants	13.46%

SRI-ENACT Toolkit – Other User Roles

- **Country/EU supervisors**
 - ✓ Read-only access to aggregated statistics
- **Country/EU Administrators**
 - ✓ Read-only access to actual SRI assessments
 - ✓ Able to add new users (assessors)
 - ✓ Check the default weightings



SRI-ENACT Tool – Tips & Takeaways

- ⚠ Please **cross-check your assessment**, before you press “Complete Assessment”. After this step, the evaluation is no longer editable.
- ⚠ The application allows **one assessment for each building**. The latest one overwrites the previous assessment.
- ⚠ After the completion of the assessment, you will have **access to the input data and the results** (also downloadable as a pdf)
- ❓ Please report any issue/bug/potential new feature in **sri-toolkit_support@singularlogic.eu**

SRI Greek Test Phase

METHOD B

120 non-residential building assessments supported
by the project **SRI-ENACT**

METHOD A & B

600 residential building assessments (Method A) and
2 non-residential assessments to predefined pilot sites
(Method B) supported by the project **SmartSquare**

METHOD A OR B OR C

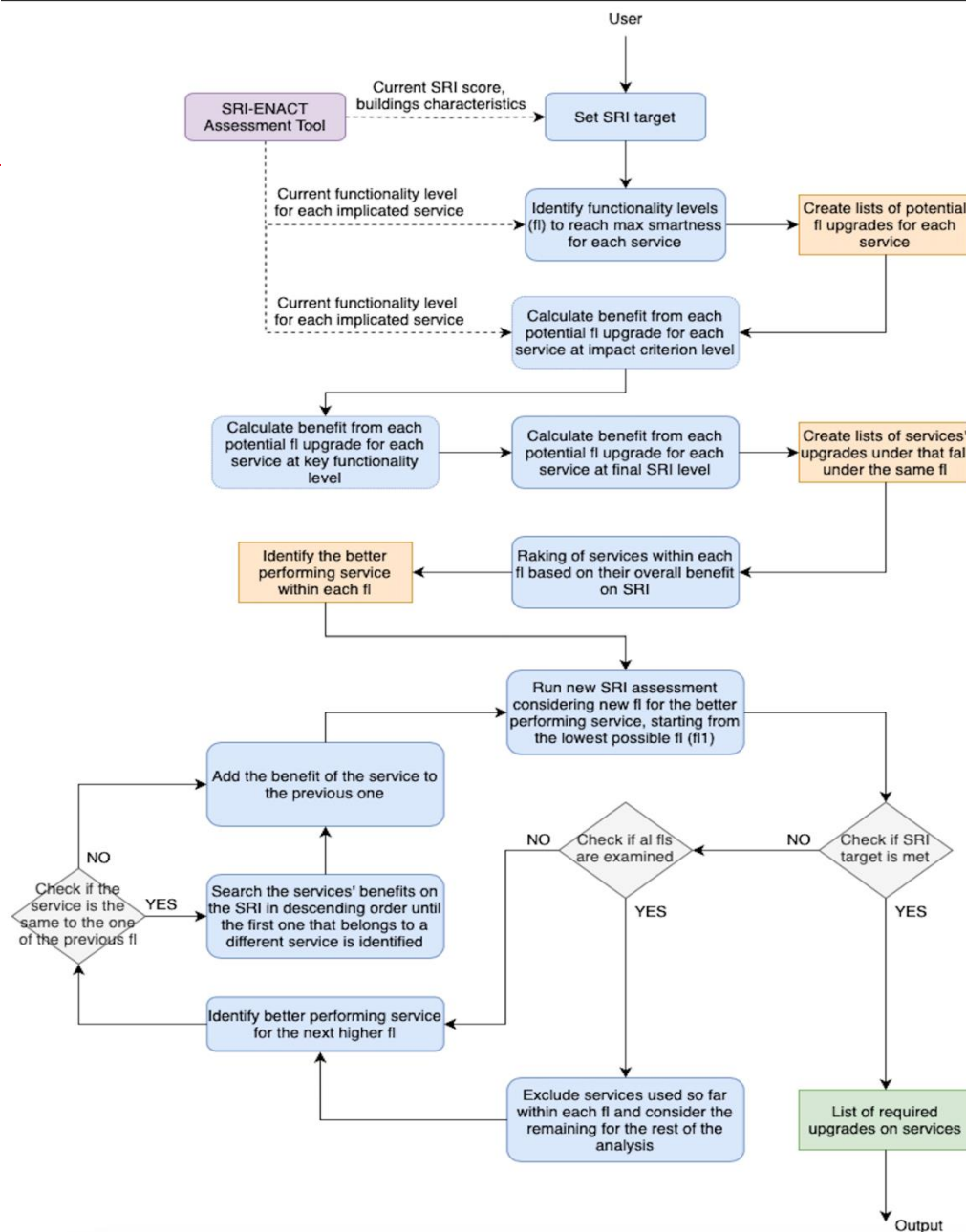
100 residential and non-residential building assessments
supported by the project **easySRI**



SRI DST – Overview

- Scenario-driven framework building on the results of the involved buildings' SRI evaluations drawn from the SRI Assessment Tool.
- Key insights and targeted solutions to the users regarding the smart-ready upgrades (or combinations of smart-ready upgrades presented as scenarios) that should be implemented.
- User-defined SRI target should be met for a building under evaluation, keeping the number of interventions to be materialised and their respective cost at their minimum levels.

SRI DST – Flowchart

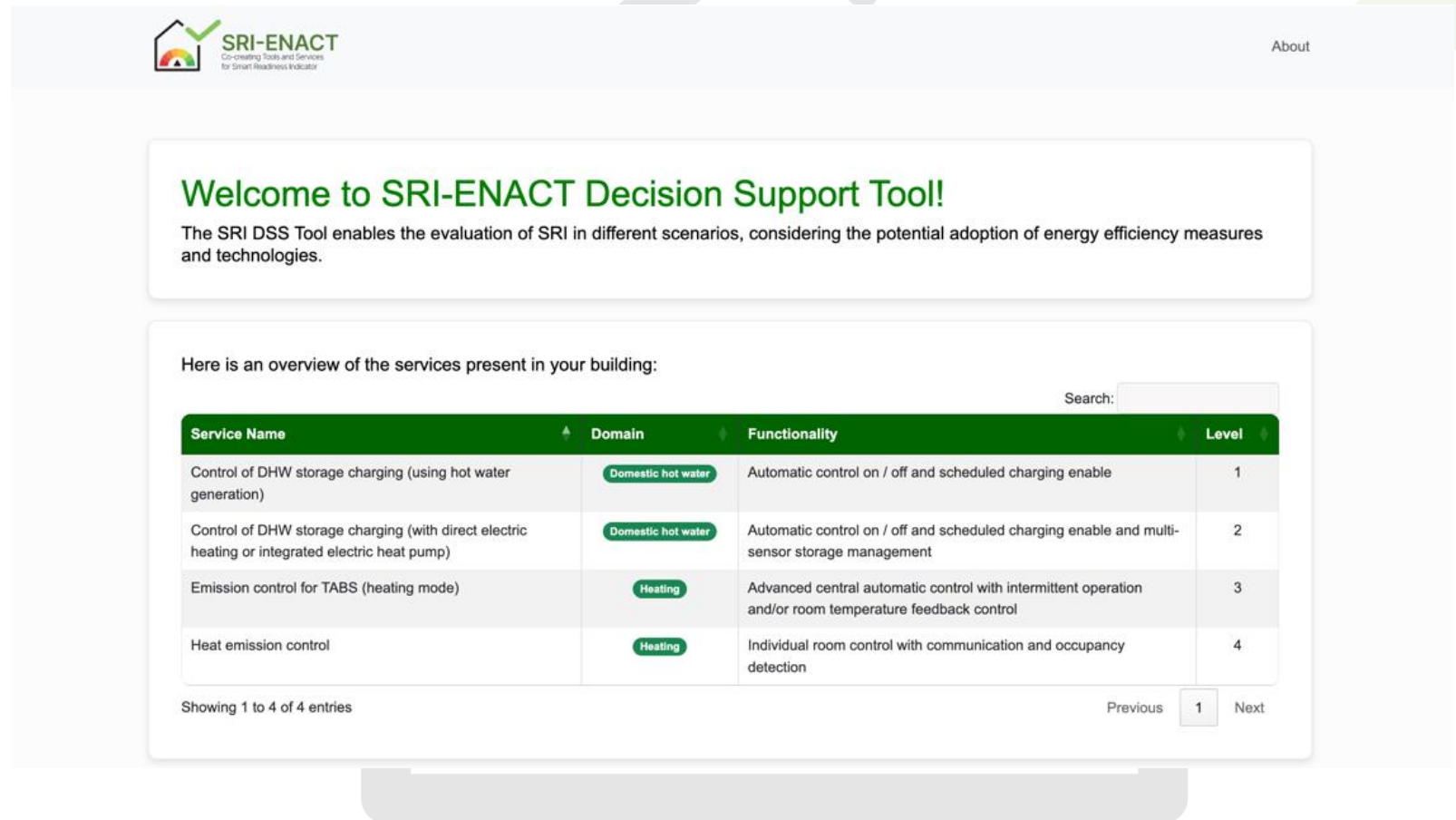


Flowchart

Apostolos Arsenopoulos

SRI DST – Set your SRI Goal page (1/3)

- Overview of the present smart-ready services in the building under examination – interconnection point to the SRI Assessment Tool.



The screenshot shows the SRI-ENACT Decision Support Tool interface. At the top, there is a header with the SRI-ENACT logo and the text "Co-creating Tools and Services for Smart Readiness Indicator Uptake". To the right of the header is a link labeled "About".

Below the header, there is a green box with the text "Welcome to SRI-ENACT Decision Support Tool!" and a paragraph: "The SRI DSS Tool enables the evaluation of SRI in different scenarios, considering the potential adoption of energy efficiency measures and technologies."

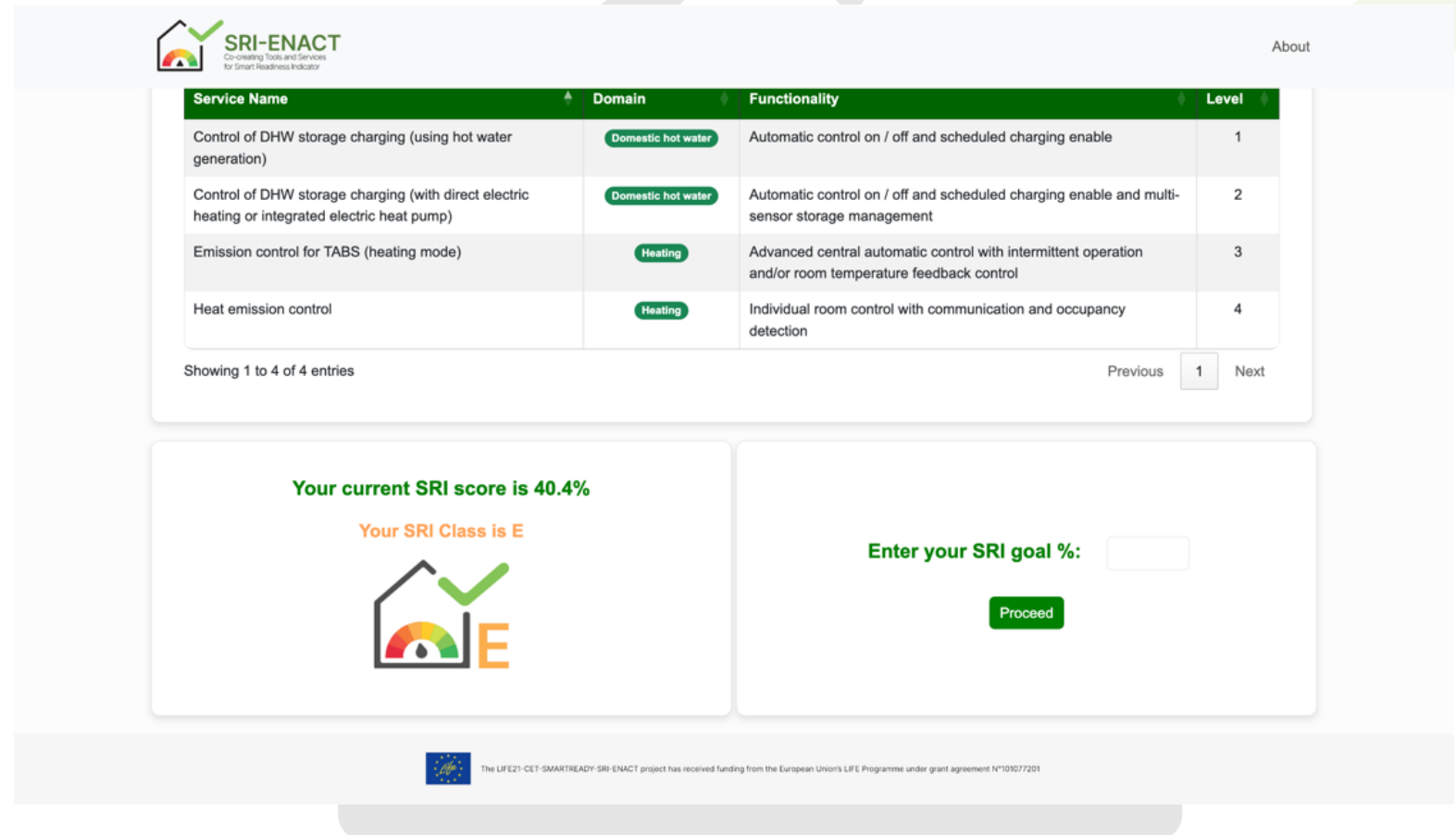
Below this, there is a section titled "Here is an overview of the services present in your building:". To the right of this text is a search bar labeled "Search:". Below the search bar is a table with the following columns: "Service Name", "Domain", "Functionality", and "Level".

Service Name	Domain	Functionality	Level
Control of DHW storage charging (using hot water generation)	Domestic hot water	Automatic control on / off and scheduled charging enable	1
Control of DHW storage charging (with direct electric heating or integrated electric heat pump)	Domestic hot water	Automatic control on / off and scheduled charging enable and multi-sensor storage management	2
Emission control for TABS (heating mode)	Heating	Advanced central automatic control with intermittent operation and/or room temperature feedback control	3
Heat emission control	Heating	Individual room control with communication and occupancy detection	4

Below the table, there is a pagination bar that says "Showing 1 to 4 of 4 entries". To the right of the pagination bar are links for "Previous", "1", and "Next".

SRI DST – Set your SRI Goal page (2/3)

- Overview of the current SRI score and the SRI class for the building under evaluation
- Interaction with the user through the requested SRI goal.



The screenshot displays the SRI-ENACT Decision Support Tool interface. At the top, the SRI-ENACT logo and 'About' link are visible. Below is a table listing services, their domains, functionalities, and levels. The table shows four entries related to DHW storage charging and emission control. Below the table, there are navigation links 'Previous', '1', and 'Next'. The main content area shows the current SRI score as 40.4% and the SRI Class as E, accompanied by a house icon with a green checkmark and a rainbow. To the right, there is a field to 'Enter your SRI goal %' with a 'Proceed' button. At the bottom, a footer mentions funding from the European Union's LIFE Programme.

Service Name	Domain	Functionality	Level
Control of DHW storage charging (using hot water generation)	Domestic hot water	Automatic control on / off and scheduled charging enable	1
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Showing 1 to 4 of 4 entries

Previous 1 Next

Your current SRI score is 40.4%

Your SRI Class is E

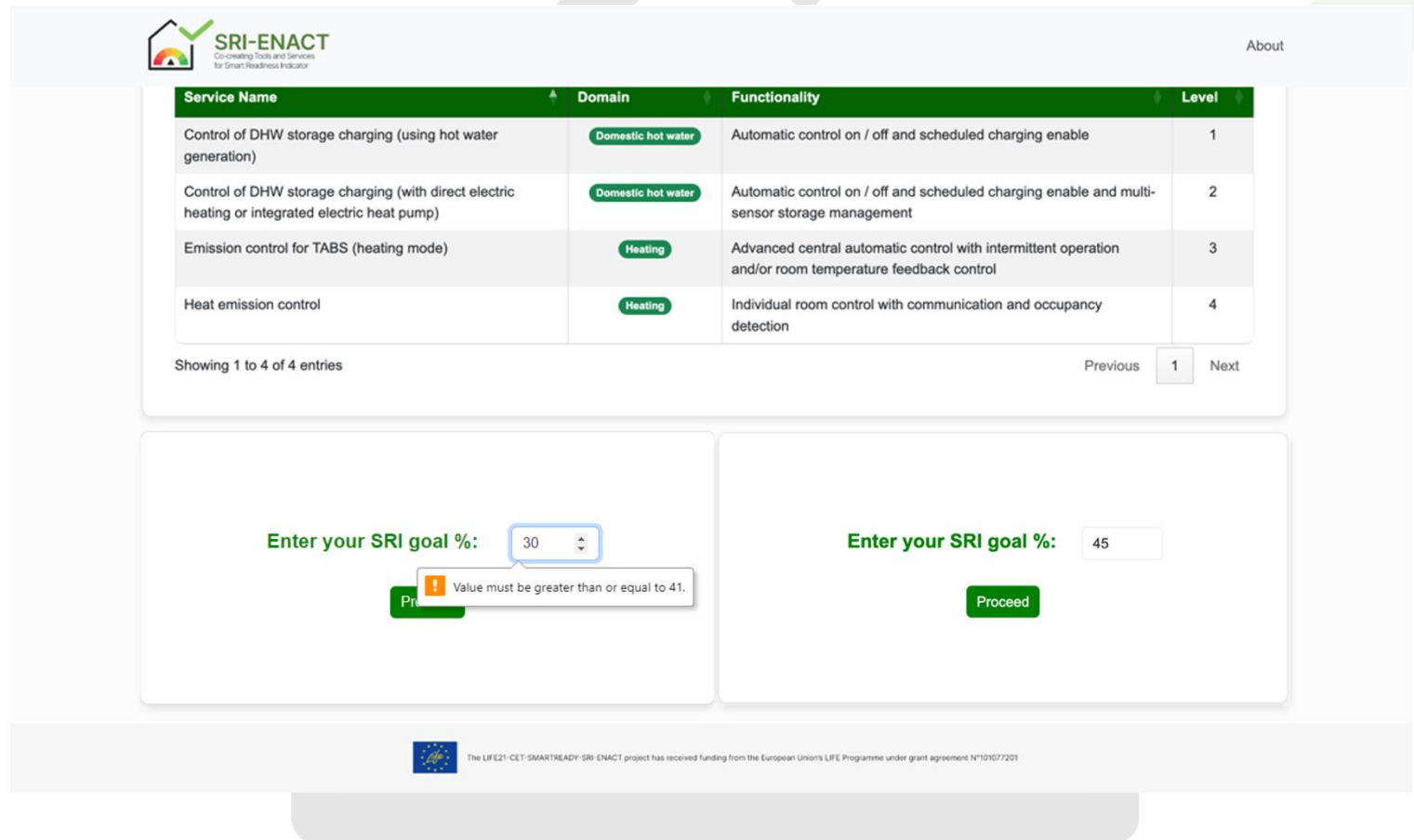
Enter your SRI goal %:

Proceed

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

SRI DST – Set your SRI Goal page (3/3)

- Operational check of the set SRI goal.
- Valid SRI and proceed to the “Upgrade Scenarios” analysis.



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

About

Service Name	Domain	Functionality	Level
Control of DHW storage charging (using hot water generation)	Domestic hot water	Automatic control on / off and scheduled charging enable	1
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Showing 1 to 4 of 4 entries

Previous 1 Next

Enter your SRI goal %:

Value must be greater than or equal to 41.

Proceed

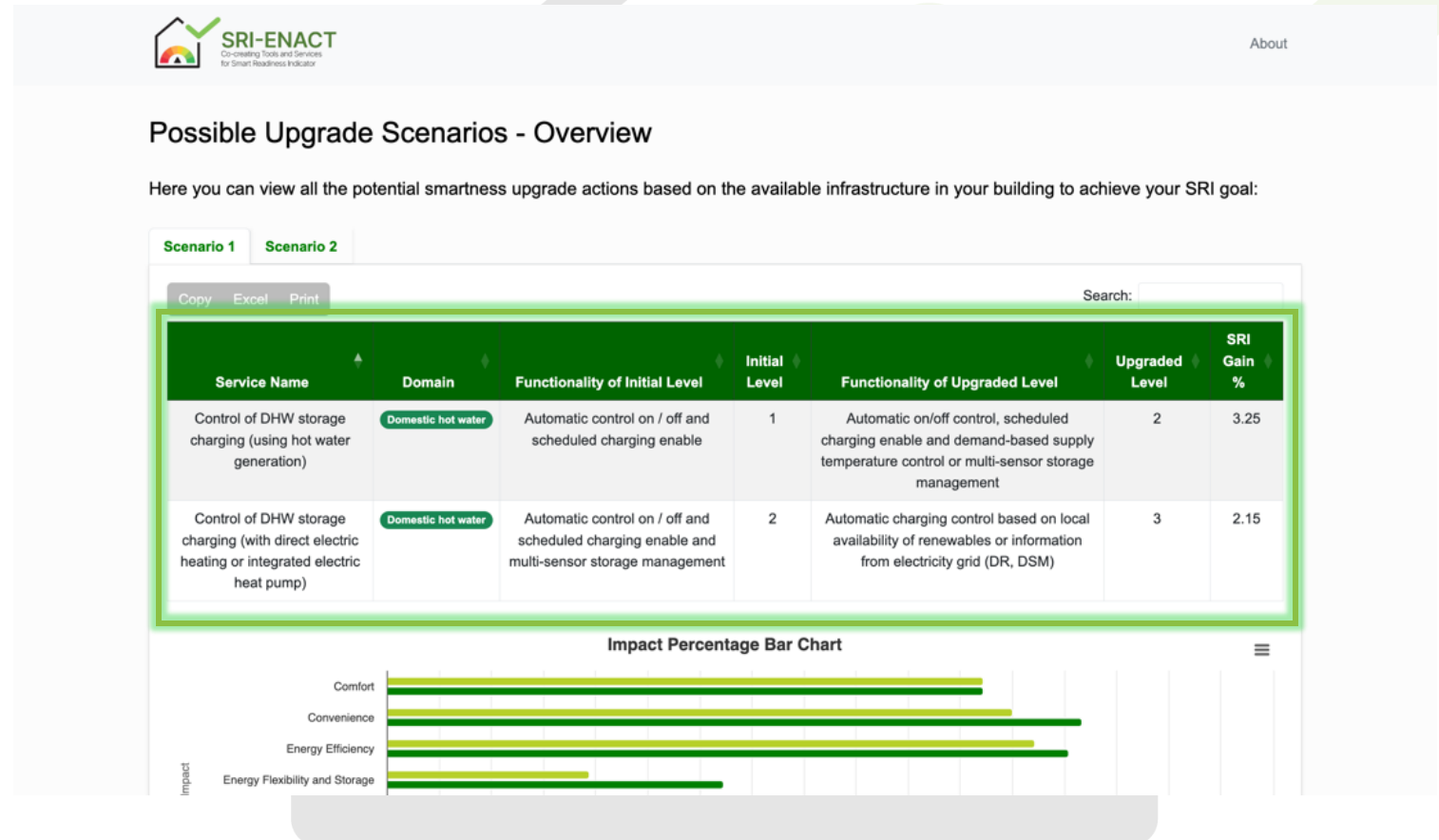
Enter your SRI goal %:

Proceed

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

SRI DST – Scenarios page (1/4)

- Overview of the potential smartness upgrade scenarios that meet the SRI goal, and effect on the impact criteria.
- Detailed information on the potential smartness upgrade scenarios



Possible Upgrade Scenarios - Overview


Here you can view all the potential smartness upgrade actions based on the available infrastructure in your building to achieve your SRI goal:

Scenario 1 Scenario 2

Copy Excel Print Search:

Service Name	Domain	Functionality of Initial Level	Initial Level	Functionality of Upgraded Level	Upgraded Level	SRI Gain %
Control of DHW storage charging (using hot water generation)	Domestic hot water	Automatic control on / off and scheduled charging enable	1	Automatic on/off control, scheduled charging enable and demand-based supply temperature control or multi-sensor storage management	2	3.25
Control of DHW storage charging (with direct electric heating or integrated electric heat pump)	Domestic hot water	Automatic control on / off and scheduled charging enable and multi-sensor storage management	2	Automatic charging control based on local availability of renewables or information from electricity grid (DR, DSM)	3	2.15

Impact Percentage Bar Chart



Impact

Comfort

Convenience

Energy Efficiency

Energy Flexibility and Storage

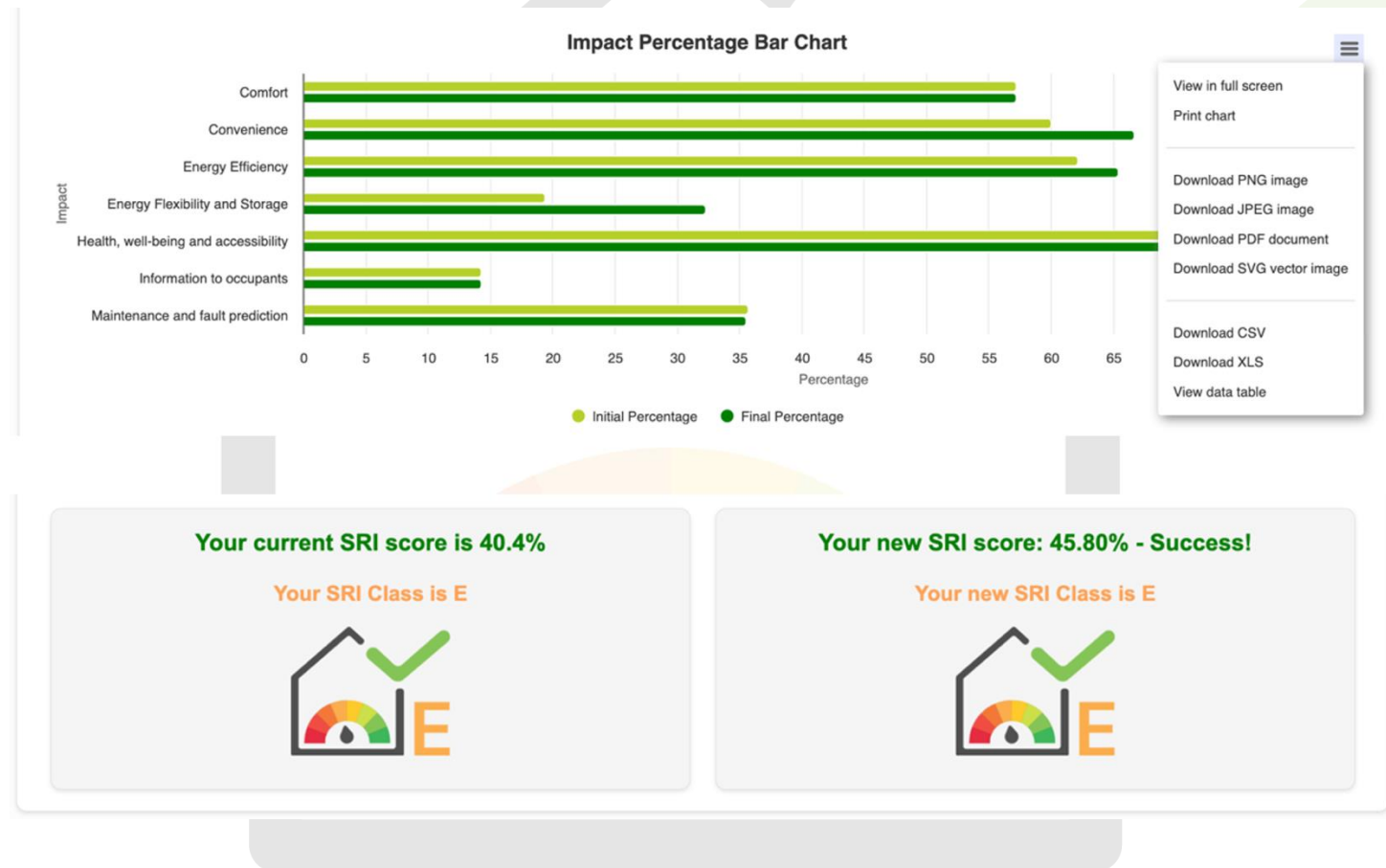
SRI DST – Scenarios page (2/4)

- ‘Upgrade scenarios’ effect on the impact criteria and calculation of the new SRI score and class for each scenario that meet the defined SRI goal.
- The upgrade scenario’s effect on the impact criteria is compared to the current situation captured by the SRI Assessment Tool.



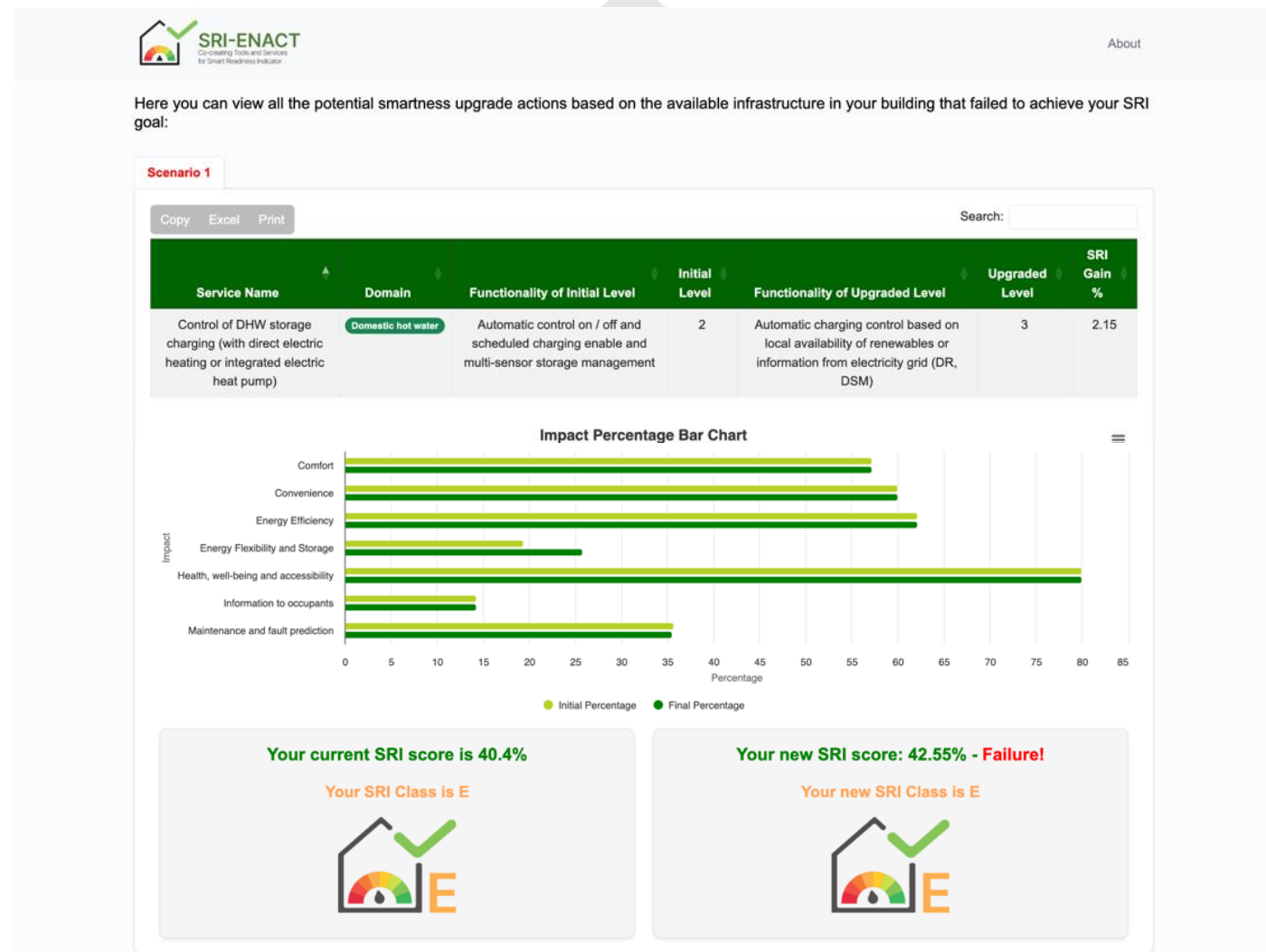
SRI DST – Scenarios page (3/4)

- A smart functions' suite is linked to the graph of the effect of each scenario upgrade on the impact criteria.
- Comparative presentation of the current and new SRI score and class for each upgrade scenario.



SRI DST – Scenarios page (4/4)

- Overview of the potential smartness upgrade scenarios that fail to meet the SRI goal.
- Presentation of the upgrade scenarios' effect that fail to meet the defined SRI goal on the impact criteria.
- Calculation of the new SRI score and class.





SRI-ENACT

Co-creating Tools and Services
for Smart Readiness Indicator Uptake

Thank you!

24/09/2024

Apostolos Arsenopoulos (NTUA)



SUSTAINABLE
PLACES **2024**

tunES

Better Regulation Toolbox

EPBD Implementation: Smartness for Energy Efficiency –
tools for buildings and their users

24.09.2024, Sustainable Places 2024, Luxembourg

Supported by (Technical Support Team - TST):



POLITECHNIKA
LUBELSKA

Partners:



KAPRES | CENTRE FOR RENEWABLE
ENERGY SOURCES AND SAVING



Co-funded by the
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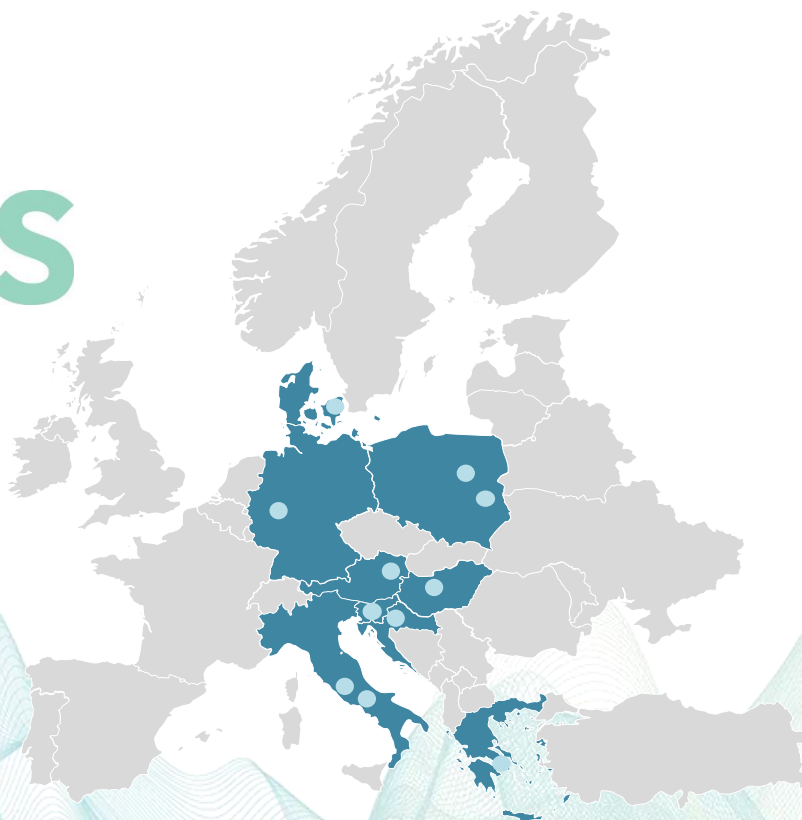
This project has received funding from the European Union's funding instrument for the environment and climate action (LIFE programme) under grant agreement No 101120926.

tunES Overview

tunES supports seven Energy Agencies to prepare the next policy transposition of EPBD

TUNES: TUNING EPC AND SRI INSTRUMENTS TO DELIVER FULL POTENTIAL

- ▶ Time frame: 24 Months, between September '23 – August '25
- ▶ Funding: LIFE Programme
- ▶ Coverage: 9 EU countries represented.



CONSORTIUM

Partners (agencies or representatives)



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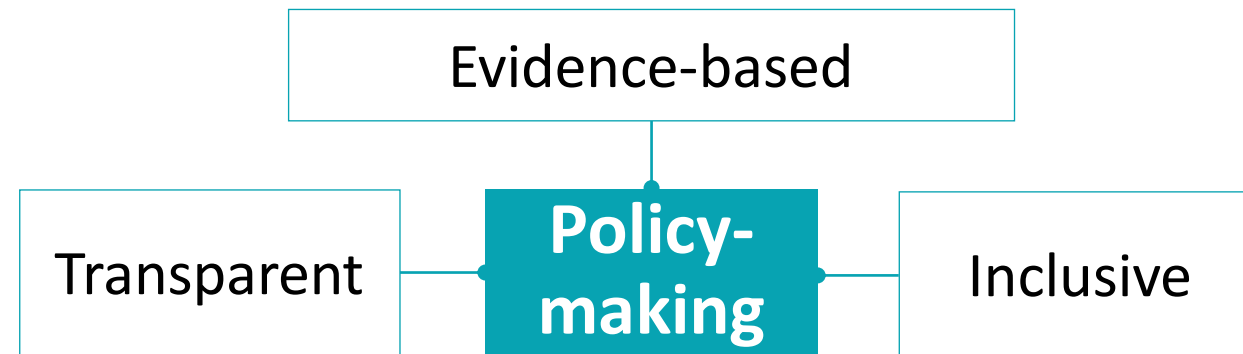


Better Regulation Guideline & Tools

The BRG is a very advanced approach to policy making

BRG OVERVIEW

69 tools, >600 pages



HOW DOES BRG GET INTO A LIFE PROJECT?

EC has gathered a lot of experience in using BRG

We believe national policy would also benefit ...

... and seven energy agencies are working on it



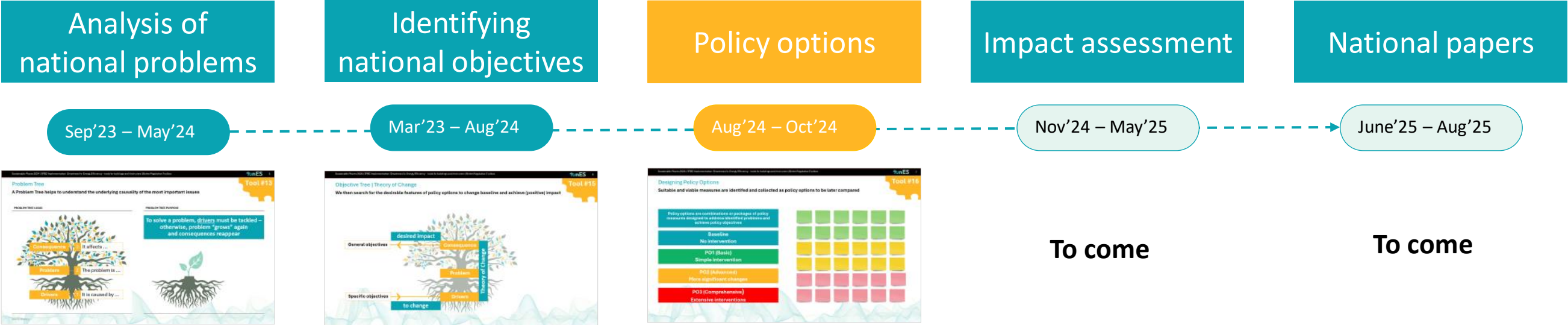
BRG - A EUROPEAN FRAMEWORK TO POLICY MAKING



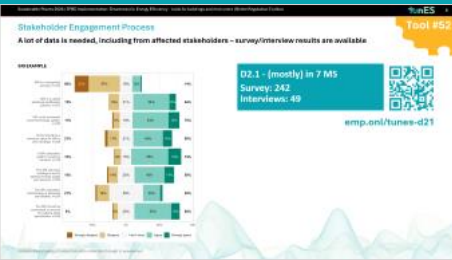
Overview of policy work using BRG

The policy design process in tunES applies the BRG Toolbox on national level

Overview of policy effort conducted by seven energy agencies



Stakeholder consultation throughout

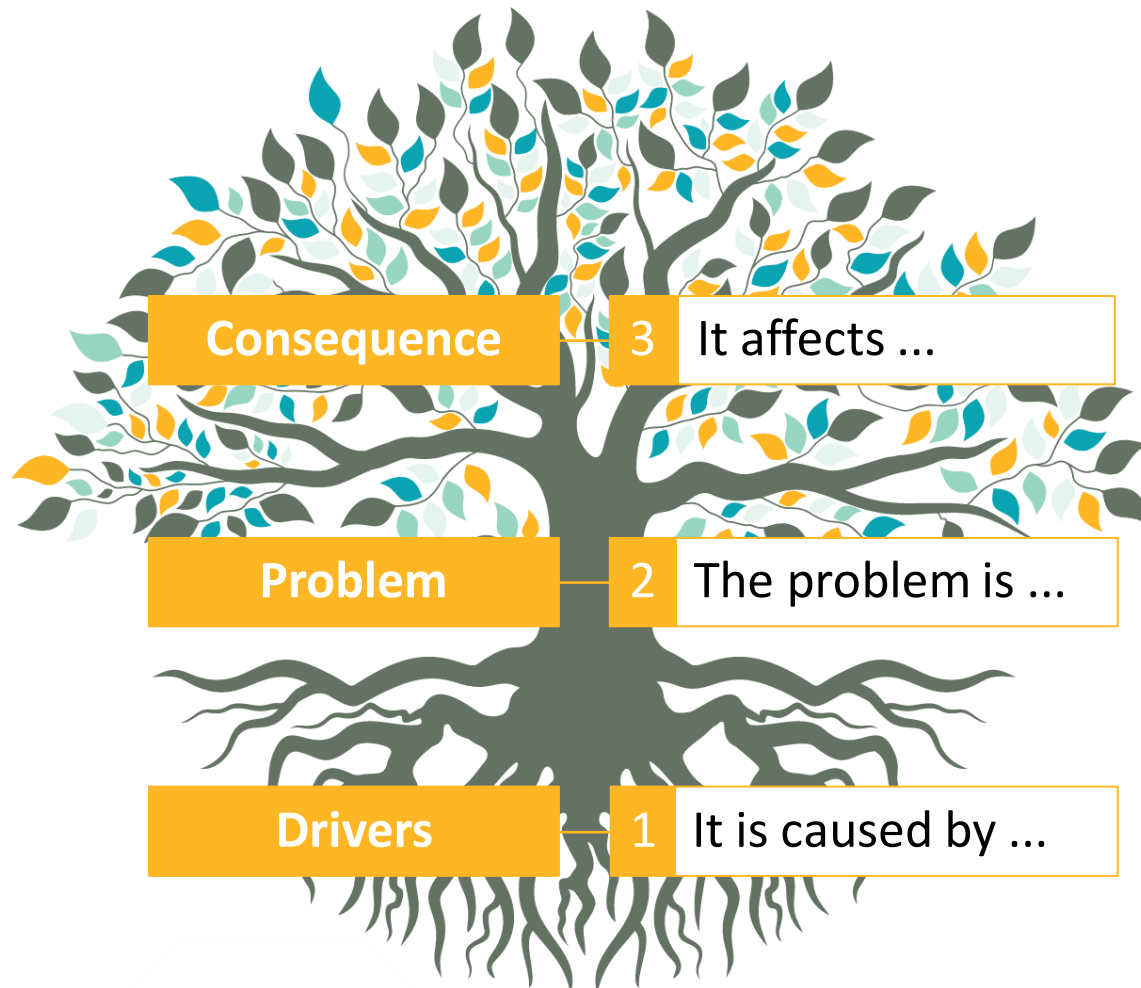


Problem Tree

Tool #13

A Problem Tree helps to understand the underlying causality of the most important issues

PROBLEM TREE LOGIC



PROBLEM TREE PURPOSE

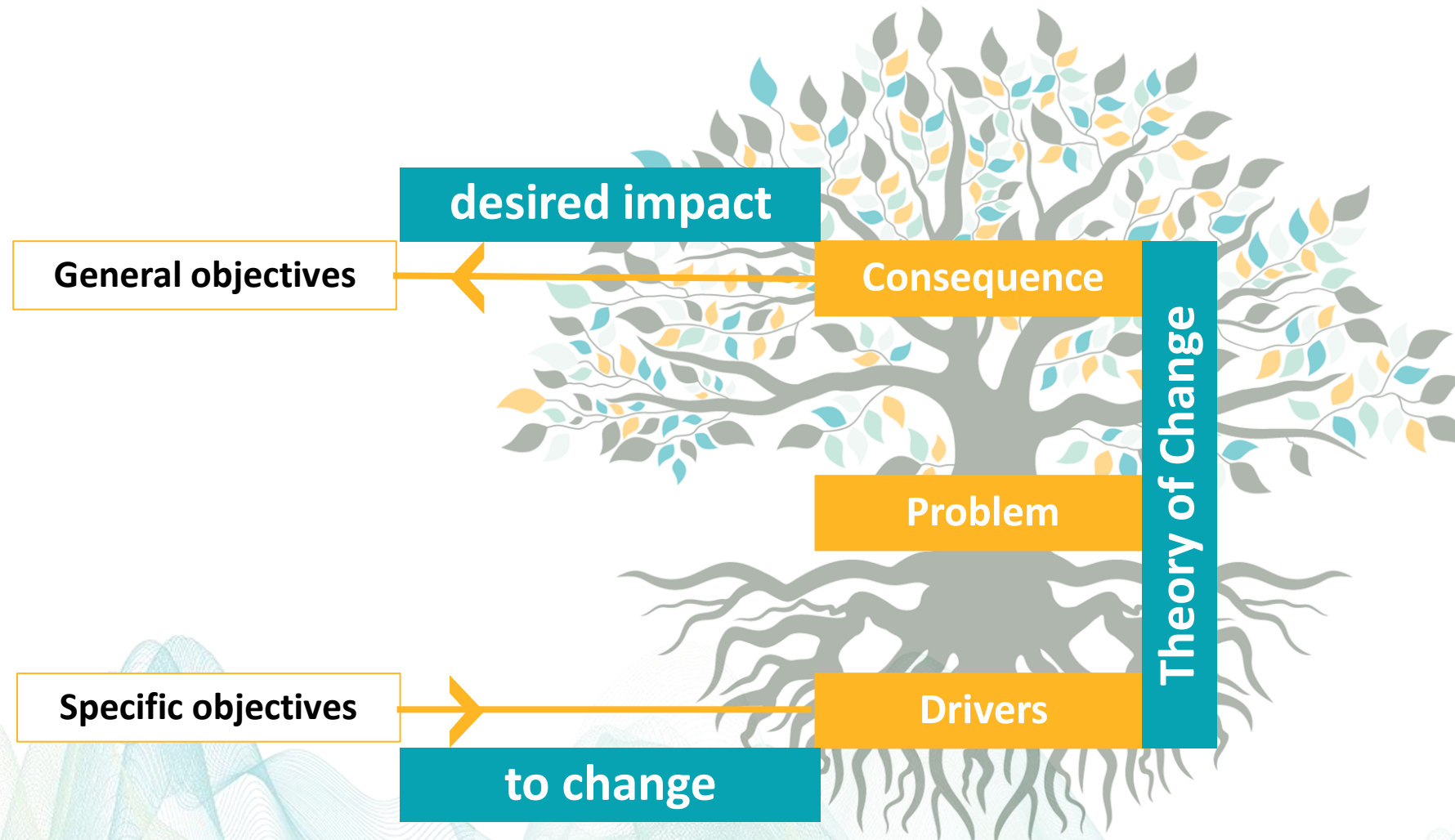
To solve a problem, drivers must be tackled – otherwise, problem “grows” again and consequences reappear



Objective Tree | Theory of Change

We then search for the desirable features of policy options to change baseline and achieve (positive) impact

Tool #15



Designing Policy Options

Tool #16

Suitable and viable measures are identified and collected as policy options to be later compared

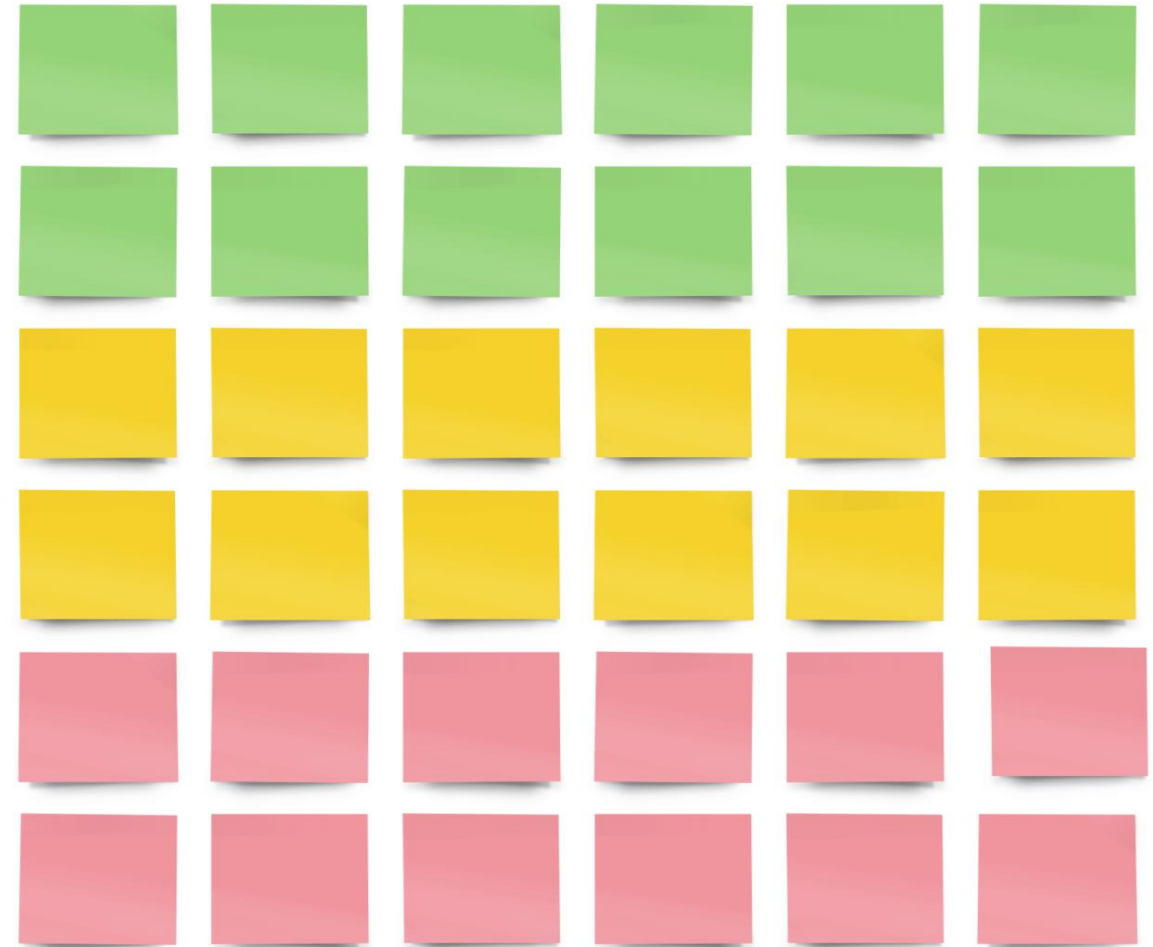
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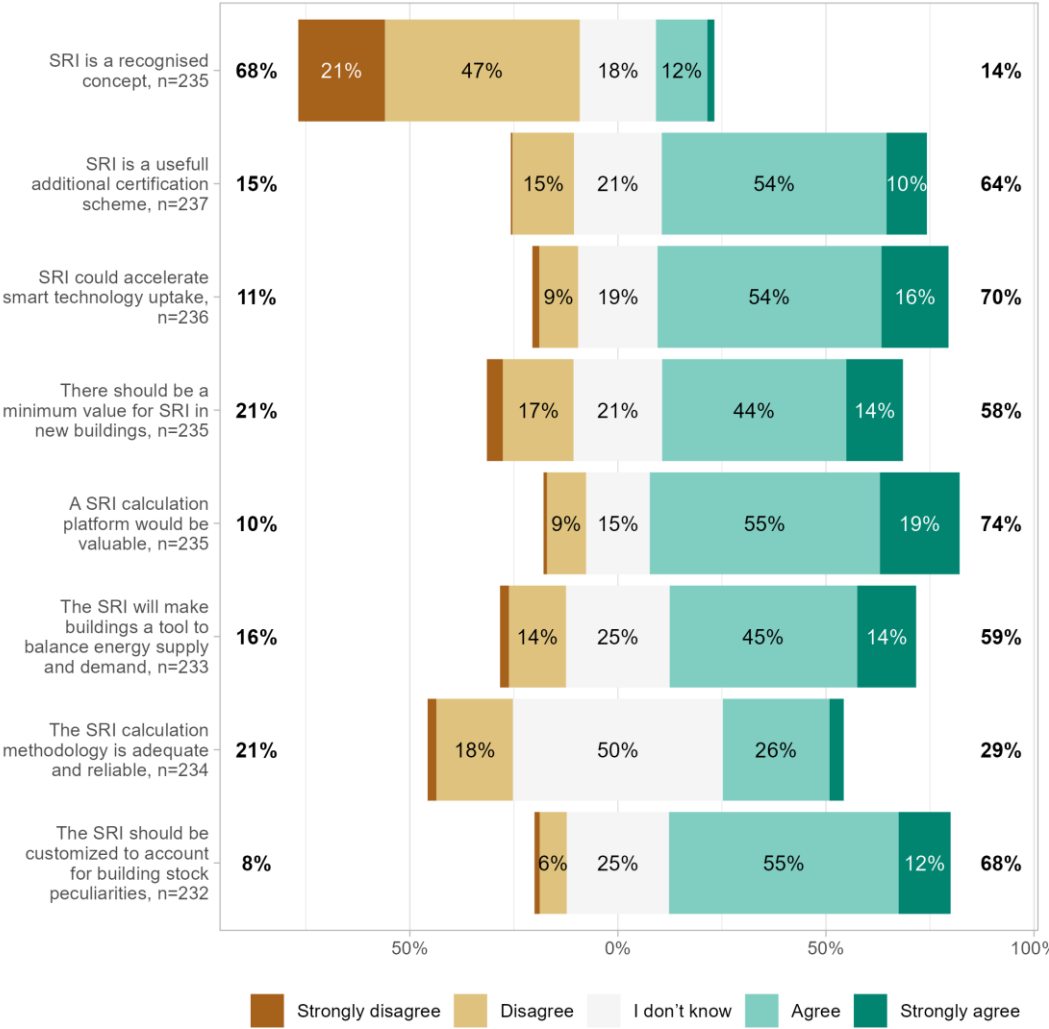


Stakeholder Engagement Process

Tool #52

A lot of data is needed, including from affected stakeholders – survey/interview results are available

SRI EXAMPLE



D2.1 - (mostly) in 7 MS
Survey: 242
Interviews: 49



emp.onl/tunes-d21

tunES Outlook

Overview of the next steps and final outcomes

FURTHER STEPS TO BE TAKEN

Impact assessment

Workshops with stakeholders

Further interaction with ministries

Roll-out pathways for preferred option

FINAL OUTCOMES

7 national policy papers for further uptake by ministry and legislative body

1 methodology guidance on all steps

Update of good practice collection for EPC, SRI



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Exchange with other agencies

No commitment etc.

Contact us





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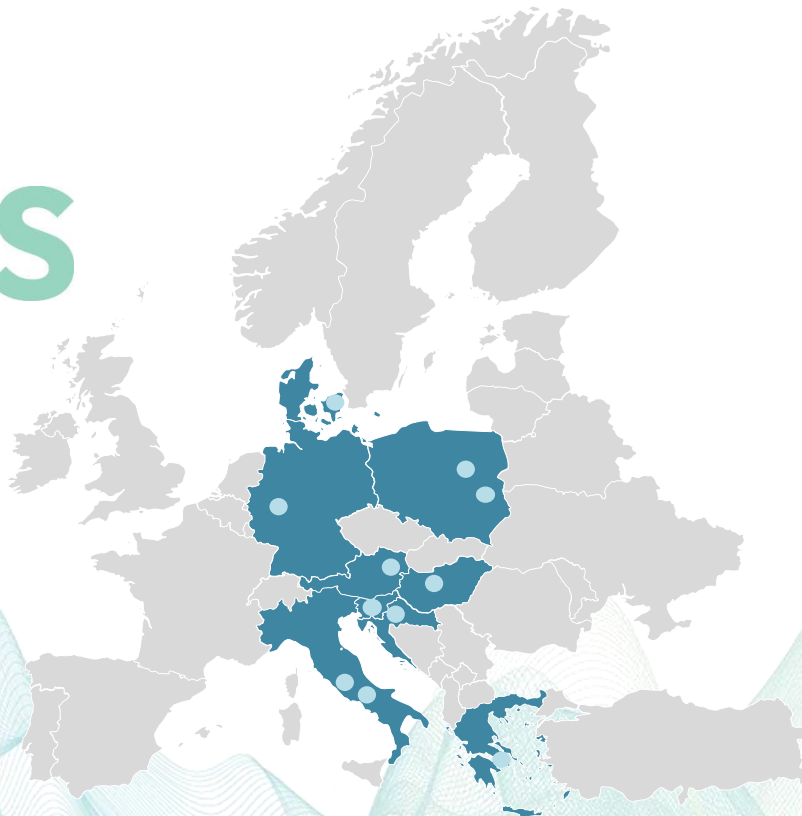
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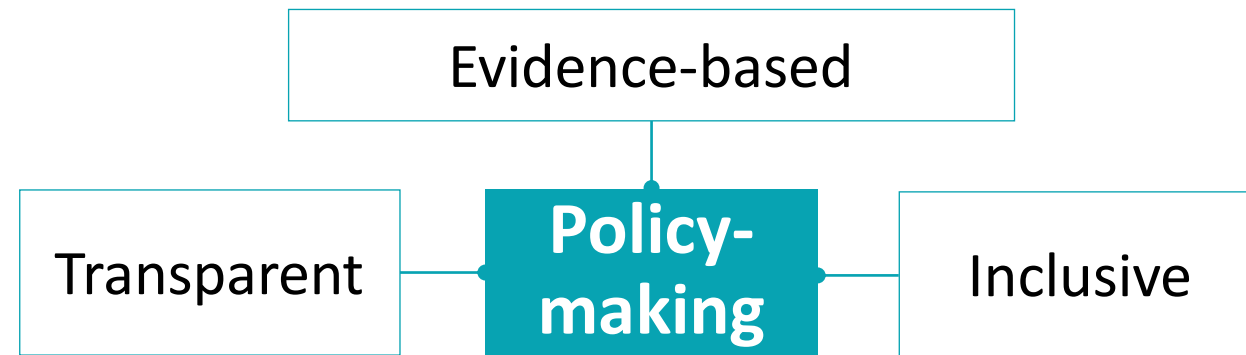


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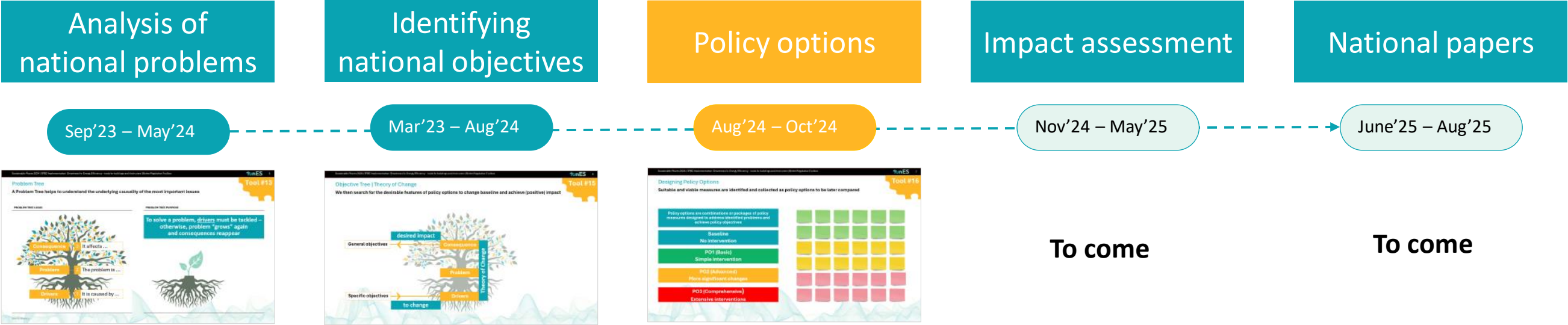
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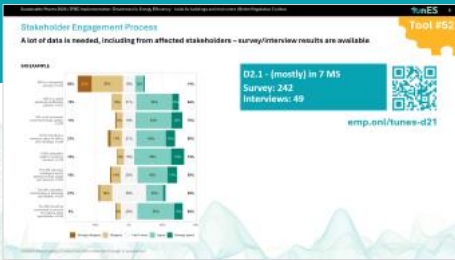
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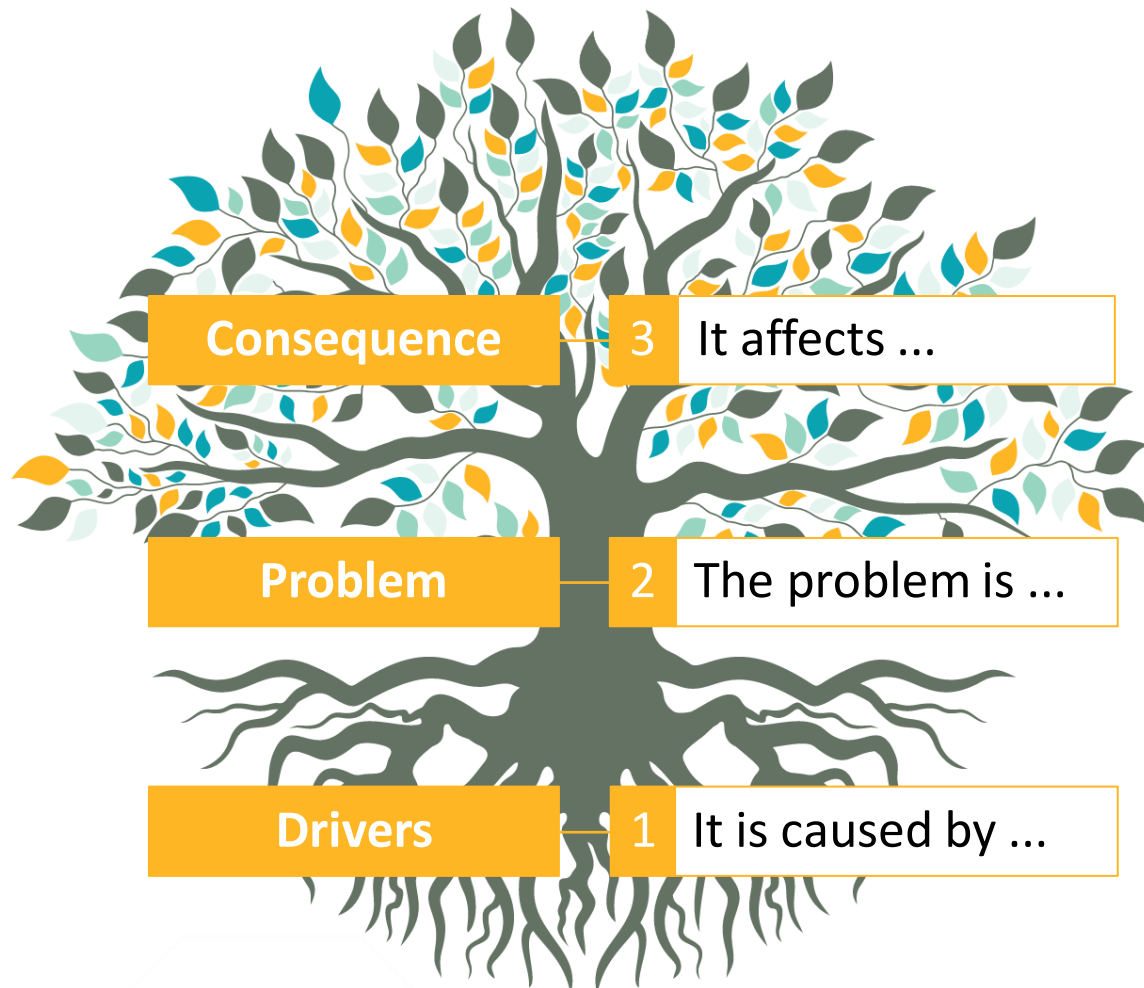


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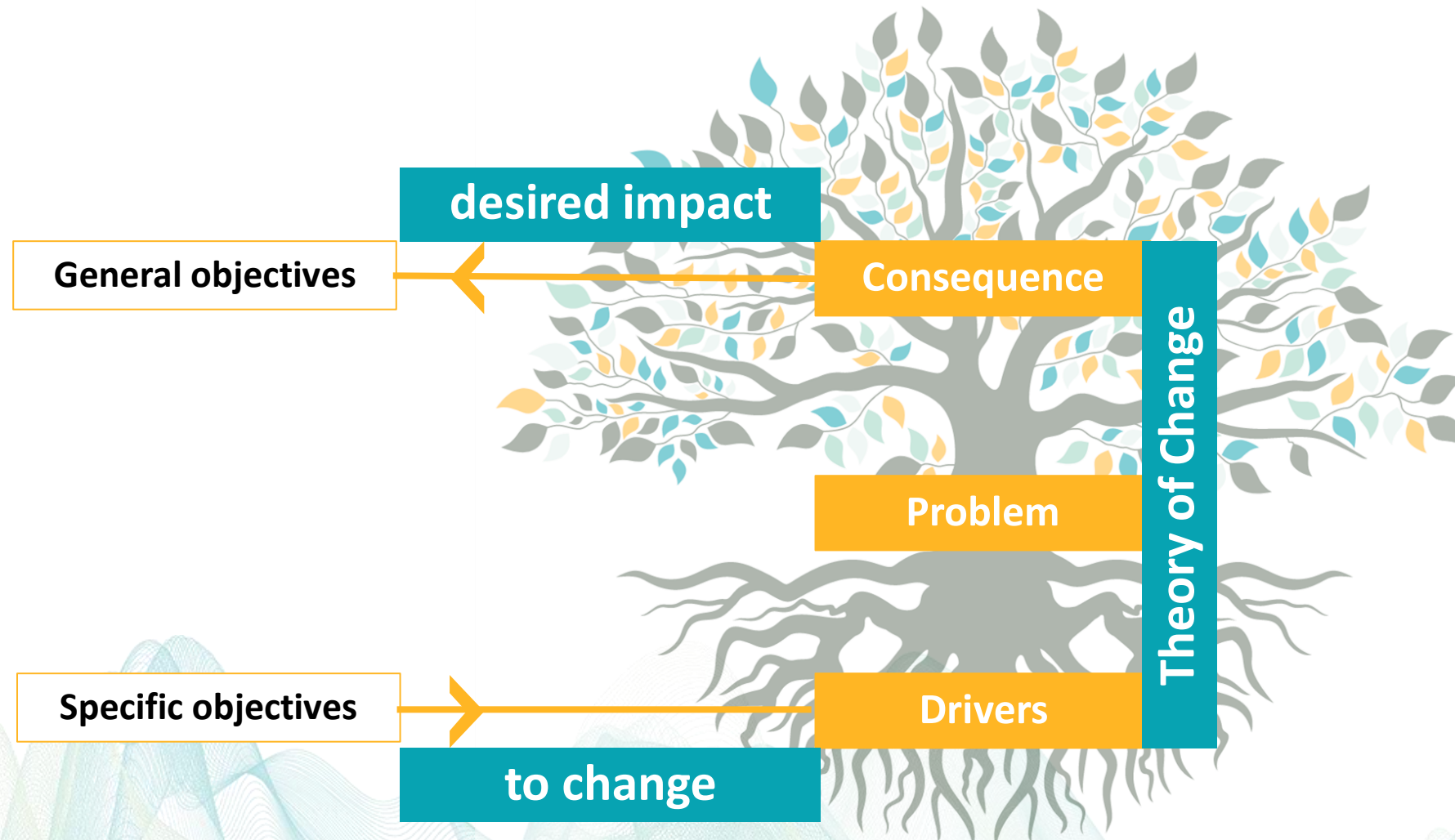
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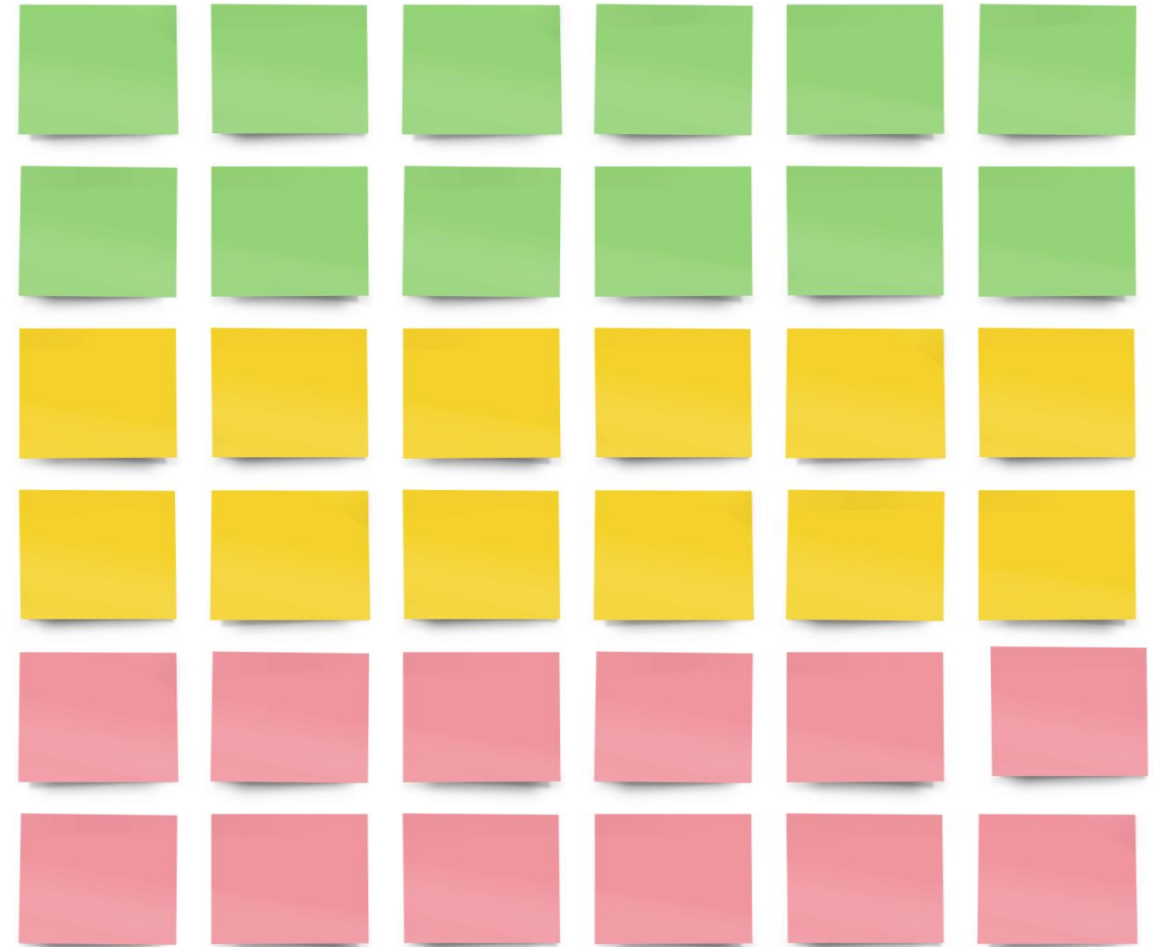
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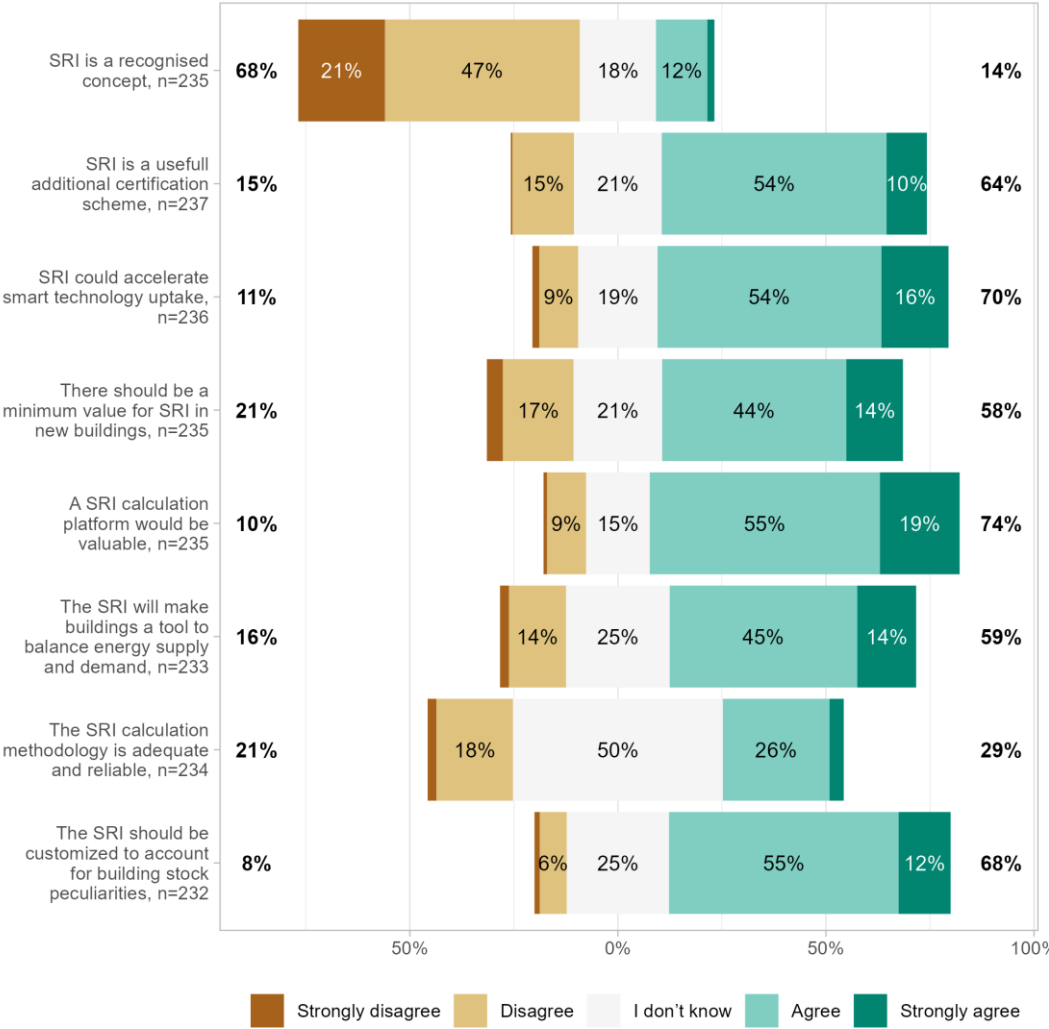


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No commitment etc.

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empirica





CENER

NATIONAL RENEWABLE
ENERGY CENTRE

SRI2MARKET

Tool Suite & link to iEPB project

María Fernández Boneta

Research Project Manager & Senior Engineer

CENER – National Renewable Energy Centre

SP2024, 24th September 2024, Luxembourg



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Why SRI2MARKET?



Support the targeted countries on introducing the SRI into their national regulation



Provide training to EPC assessors on the SRI and the methodology of its calculation



Propose public funding schemes to finance SRI upgrades in buildings



Set up SRI pilots at national level so as to identify best practices for SRI assessments



Develop tools to guide SRI assessors and streamline building assessments



Provide recommendations to building owners and facility managers on cost-effective SRI upgrades

Where?

Austria

AEE INTEC
BOKU

Croatia

EIHP

Cyprus

CEA

France

R2M

Greece

UPRC
HEBES

Portugal

ADENE

Spain

CENER
EFINOVATIC



UNIVERSITY OF NATURAL RESOURCES
AND LIFE SCIENCES, VIENNA



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efinovatic



Agência para a Energia



HEBES



Cyprus
Energy
Agency

SRI2MARKET



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PLACES 2024**

SRI2MARKET Tool suite

E-learning platform

E-learning lessons on the SRI and its assessment methodology. The course is structured in chapters and rely on training materials such as videos and documents in every partner's national language.

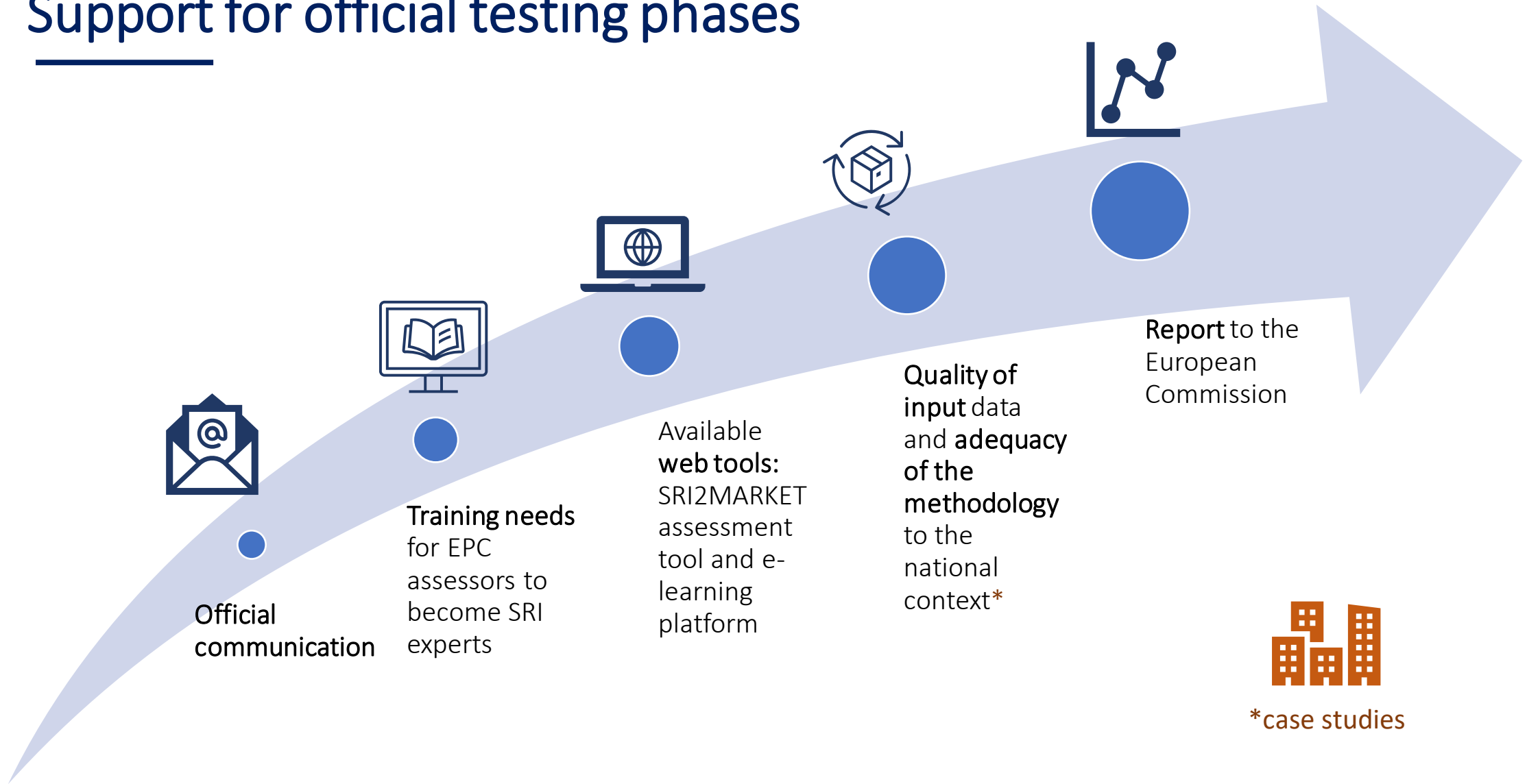
The program is mainly practical and based on examples / case studies. Participants take several tests at the end and receive up to three level of badges according to each step.

SRI assessment tool

The tool provide a user-friendly interface for users to save their SRI assessments. The underlying calculation engine is flexible and easily customizable according to national specificities and priorities.

The tool also create dynamic scorecards according to pre-defined filters, and automatically compare SRI assessments of buildings situated in different countries.

Support for official testing phases



SRI2MARKET e-learning platform



<https://learning.sri2market.eu/>

learningSRI2MARKET Home Dashboard My courses Site administration

- > Welcome
- > Introduction
- > Common EU scheme
- > 1. Heating domain
- > 2. Cooling domain
- > 3. Domestic hot water do...
- > 4. Ventilation domain
- > 5. Lighting domain
- > 6. Dynamic building envel...
- > 7. Electricity domain
- > 8. Electric vehicle charging...
- > 9. Monitoring and control ...
- > SRI2MARKET web tool
- > Case studies: Examples
- > Become SRI expert
- > Feedback about the SRI



Following the process above, the course will include a system of badges which will be awarded to each student who achieves and completes a particular part of the course according to the criteria below:

1. Level 1 - SRI User: Register for the course and read (and "mark as done") the sections "Course info", "Introduction to the SRI" and "History of the SRI".
2. Level 2 - SRI Beginner: Pass all quizzes with a minimum grade of 6.
3. Level 3 - SRI Expert: Pass the course with a grade of 6 or above, submit the assignment (see Become SRI expert) and submit the feedback form ([survey](#)).



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All Search Sort by course name Card

SRI2MARKET
CY

SRI2MARKET
FR

SRI2MARKET
AT

SRI2MARKET
ES

SRI2MARKET
HR

SRI2MARKET
PT



Registration



<https://learning.sri2market.eu/>



SRI2MARKET

Log in

[Lost password?](#)

Log in using your account on:



Is this your first time here?

For full access to this site, you first need to create an account.

Create new account

English (en) ▾

Cookies notice

The screenshot shows the SRI2MARKET learning platform interface. At the top, there is a navigation bar with the text "Co-funded by the European Union" and a logo. Below this, there are links for "Home", "Dashboard", and "My courses". The main content area is titled "Learning SRI2MARKET" and "Available courses". It lists two courses: "SRI2MARKET English Version" and "SRI2MARKET curso en español". Each course entry includes a description, the course logo, and a list of teachers. The "English Version" course is taught by Pablo Carnero, María Fernández Boneta, and Sotiris Papadelis. The "curso en español" course is taught by Francisco Aguilar, Sergio Díaz de Garayo, María Fernández Boneta, Miguel Ángel Pascual, and Marta Sampedro. At the bottom, there is a link for "Curso SRI2MARKET Portugal".

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E-learning programme and three levels of expertise



SRI2MARKET assessment tool



<https://sri2market.eu>

User: sp2024

Password: sri2market123

Welcome to the SRI2MARKET assessment tool

Create project Project list Benchmarking

This online application has been developed by the European project SRI2MARKET according to specific Regulation and other supporting material such as the SRI testing package to conduct and storage SRI assessments under protected credentials (i.e. user and password).

The **Smart Readiness Indicator (SRI)** is a common EU scheme for rating the smart readiness of buildings. Article 8 and Annex IA of the Directive (EU) 2018/844 amending Directive (EU) 2010/31, introduces the definition of the "smart readiness indicator" for buildings and Commission Delegated Regulation of 14.10.2020 supplementing Directive (EU) 2018/844 by establishing an optional common European Union scheme for rating the smart readiness of buildings. The SRI of a building or building unit is expressed by a rating that derives from a total smart readiness score expressed as a percentage and that represents the ratio between the smart readiness of a building or building unit compared to the maximum smart readiness that it could reach. The methodology also allows the use of disaggregated smart readiness scores expressed as a percentage, for instance according to the three key functionalities highlighted in point 2 of Annex Ia of the Directive 2010/31/EU:

1. Energy performance and operation
2. Response to the needs of the occupants
3. Energy flexibility, including the ability of the building or building unit to enable participation in demand response

BUILDING INFORMATION
Introduction of relevant characteristics of the building for the calculation, such as: country, typology, climatic zone...

SERVICES AND FUNCTIONALITY LEVELS
For the 9 domains each service is assessed and scored according to its functionality level.

RESULTS & RECOMMENDATIONS
Visualization of the results such as global and disaggregated scores for the SRI.

Legal notice: The results obtained from the tool are for indicative purposes only and thus, this may not lead to the issue of a smart readiness indicator certificate. The official procedure has to be defined and implemented by Member States.

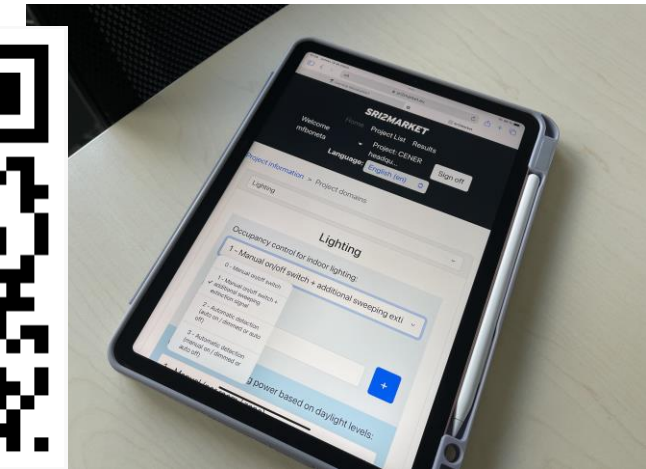
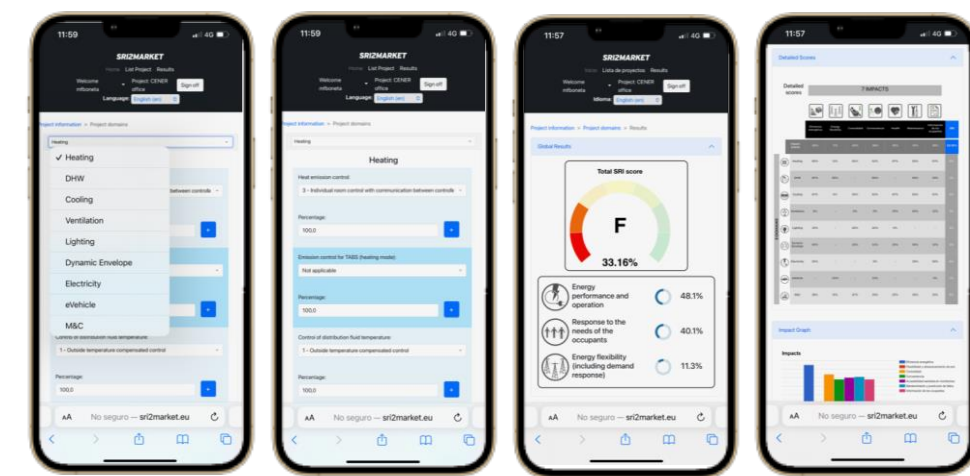
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Aggregated results (statistical results filter by):

- Country
- Building type
- Building usage
- Building state
- Effective rated output for HVAC
- Energy class
- Climate
- Catalogue/default method
- Assessment purpose
- Official test phase
- ...

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Input forms



[Project information](#) > Project domains

Heating

DHW

Cooling

Ventilation

Lighting

Dynamic Envelope

Electricity

eVehicle

M&C

Heating

Heat emission control:

3 - Individual room control with communication between controllers and to BACS

0 - No automatic control

1 - Central automatic control (e.g. central thermostat)

2 - Individual room control (e.g. thermostatic valves, or electronic controller)

3 - Individual room control with communication between controllers and to BACS

4 - Individual room control with communication and occupancy detection

Not applicable

2 - Demand based control

Percentage:

100,0

+

?

Percentage:

100,0

+

?

Percentage:

100,0

+

?

Control of distribution pumps in networks:

3 - Variable speed pump control (pump unit (internal) estimations)

Percentage:

100,0

+

?

Thermal Energy Storage (TES) for building heating (excluding TABS):

Not applicable

Percentage:

100,0

+

?

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HEATING DOMAIN

Heat emission control (H1a)

All heat emitters included, except for TABS.

INTENT

The **objective** is to adjust the heat delivered at room level, preferably by applying the control function to the heat emitter.

FUNCTIONALITY LEVELS

Level 0. No automatic control of the room temperature.

Level 1. Only central automatic control, indirectly controlling one or more rooms by acting either on the distribution or on the generation without consideration of local demand of different rooms.

The heat delivered at the room is adjusted by a control function non-exclusive of the room to be controlled.

Level 2. Individual automatic room control without communication between controllers and BACS.

The heat delivered at the room is adjusted by a control function exclusive of the room to be controlled without any information exchange outside the controlled room.

Level 3. Individual modulating room control with communication between controllers and BACS.

The heat delivered at the room is adjusted by a control function exclusive of the room to be controlled with information exchange outside the controlled room.

Level 4. Individual modulating room control with communication between controllers and BACS and demand detection-control.

The heat delivered at the room is adjusted by a control function, coupled with occupancy detection, exclusive of the room to be controlled with information exchange outside the controlled room.

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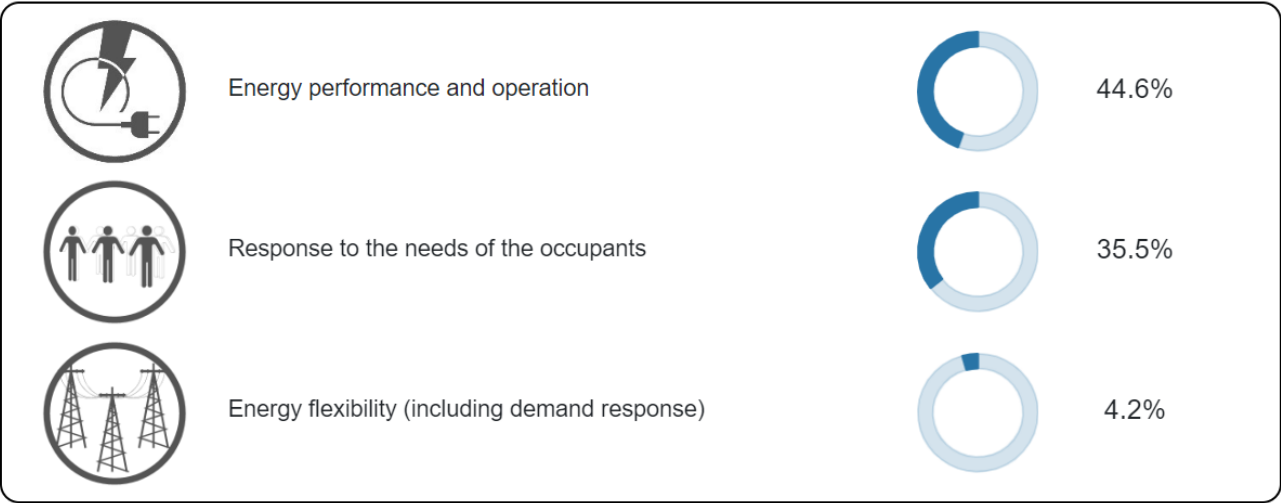
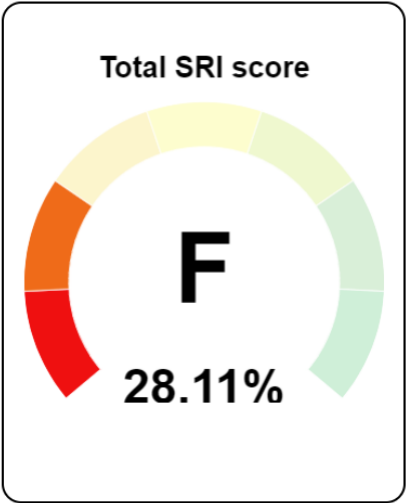
H1a

Results



Project information > Project domains > Results

Global Results



Detailed Scores

Impact Graph

EN ISO 52120

Ordinal impact scores

Improvement packages




Project List

Name	Catalogue	Country	Modify	Delete	Duplicate	ISO52120	ISO52120	Download
Example- Office building	Default Method B	Spain	<div>Modify</div>	<div>Delete</div>	<div>Duplicate</div>	<div>↑ A</div>	<div>↑ B</div>	<div>Download</div>


1 / 1

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Basic benchmarking



Benchmarking

Country:

Building Type:

Building Usage:

Building state:

Catalogue:

Effective rated output for HVAC systems:

Climate:

Assessment purpose:

Current building state

Data presented in this assessment reflects the current state of the building or a package of measures/recommendations for updating the BACS

Energy class:

-

Energy Performance Certificate (EPC) label/class

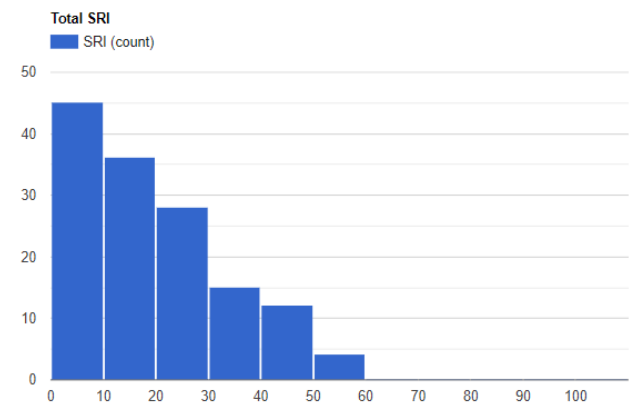
Official test phase:

☐ Click if this assessment is part of an official Member State test

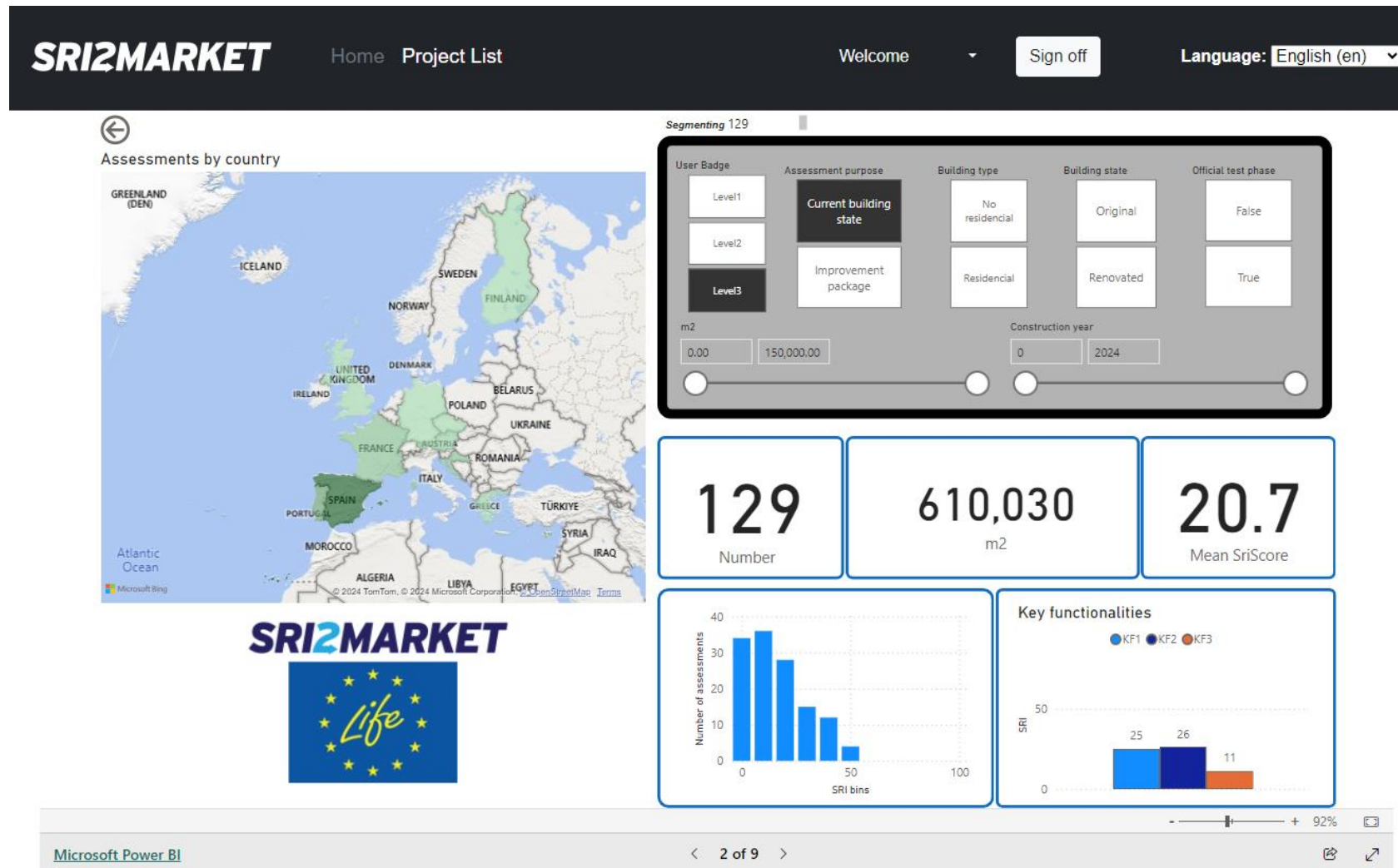
Submit

[← Check Again](#)

The total number of cases is: 140



Advanced benchmarking



Link to the iEPB project



Project List

Name	Catalogue	Country	Modify	Delete	Duplicate	ISO52120	ISO52120	Download
Example- Office building	Default Method B	Spain	Modify	Delete	Duplicate	↑ A	↑ B	Download

1 / 1

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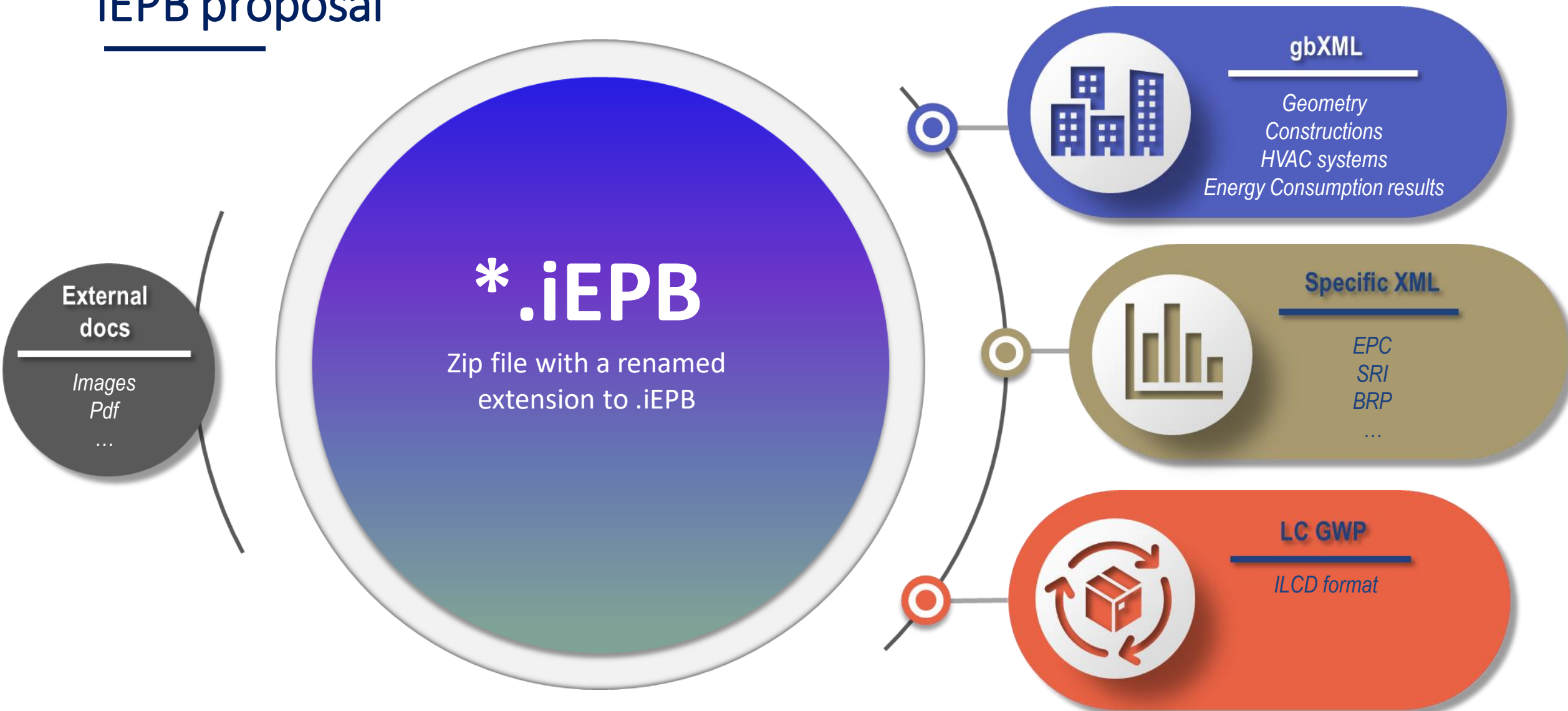
**iEPB
schema**

**Common
data model**



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iEPB proposal



Existing formats

Green Building XML Schema

gbXML

- Purpose exchange information in BEM models

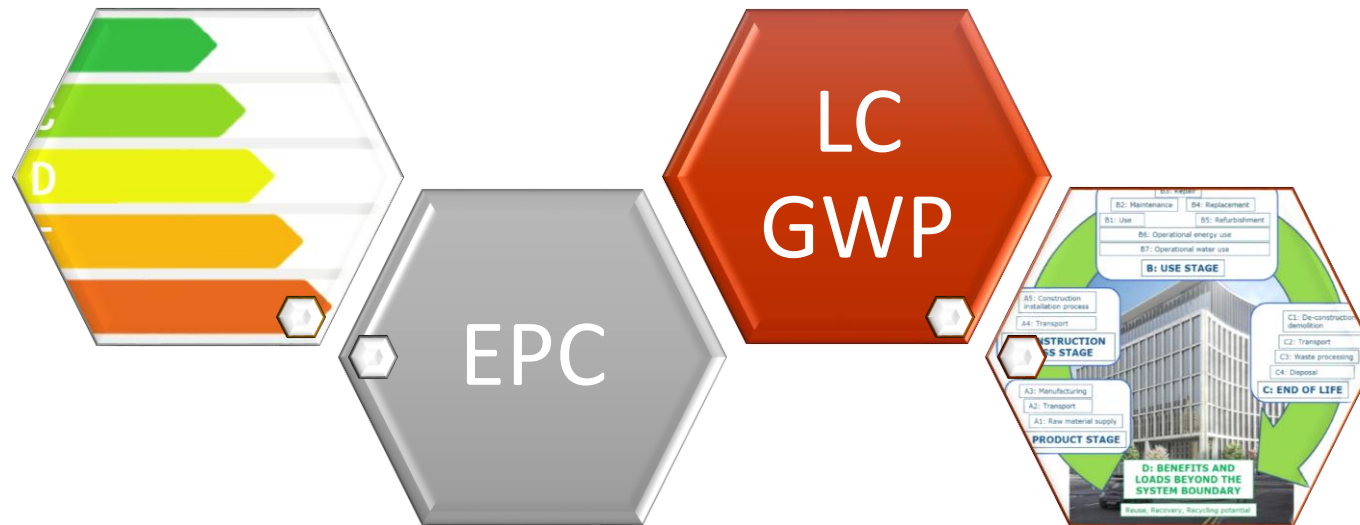
gbXML is funded by organizations such as the U.S. Department of Energy, the National Renewable Energy Lab (NREL), Autodesk, ASHRAE, Bentley Systems

International Reference Life Cycle Data System

ILCD

XML

provide guidance and standards for greater consistency and quality assurance in applying LCA
European Commission (JRC)



iEPB schema>Format design

- Use of the original gbXML elements:
 - Location
 - Envelop geometry
 - Constructions, layers, materials
 - Spaces/Thermal Zones/Building Stories
 - Internal heat gains: people, lighting, equipment, infiltration, schedules
 - HVAC equipment, Air Loops, Hydronic Loops

```
C:\Users\msampedro > VisualStudioCode > iEPBschema > iEPBschema.xml > ...  
1  <?xml version="1.0" encoding="UTF-8"?>  
2  <gbXML xmlns="http://www.gbxml.org/schema" xmlns:xhtml="http://www.w3.org/1999/xhtml" ...  
1518 </gbXML>  
1519 <Spain>  
1520 > <BuildingData> ...  
1535 </BuildingData>  
1536 <SRI></SRI>  
1537 > <EPC> ...  
1613 </EPC>  
1614 <ImprovementEnergyMeasures></ImprovementEnergyMeasures>  
1615 </Spain>  
1616 <Netherlands>  
1617 > <EPC></EPC>  
1618 <SRI></SRI>  
1619 </Netherlands>  
1620 <Austria>  
1621 > <EPC></EPC>  
1622 <SRI></SRI>  
1623 </Austria>
```

The purpose of using the gbXML format as the basis for the iEPB common data format is to reuse an already standardised format to exchange data, NOT between different countries, but between different types of building assessment at a European or even global level.

iEPB schema

Each country block will have (at least):

- A **common section** for all building data not included in the **gbXML** and shared by all national assessments.
- An EPC block containing data relevant only to the requirements of EPC assessment of buildings in the specific country.
 - A block for each certification tool with specific data
- An **SRI block** (including inputs and outputs of the methodology)

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <Spain>
4  > <BuildingData> ...
20 </BuildingData>
21 > <SRI></SRI>
22 > <EPC> ...
98 </EPC>
99 <ImprovementEnergyMeasures></ImprovementEnergyMeasures>
100 </Spain>
101 <Netherlands>
102 > <BuildingData></BuildingData>
103 <EPC></EPC>
104 > <SRI></SRI>
105 </Netherlands>
106 <Austria>
107 > <BuildingData></BuildingData>
108 <EPC></EPC>
109 > <SRI></SRI>
110 </Austria>
```



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