



Climate-Resilient Development Pathways in Metropolitan Regions of Europe – Deliverable

Deliverable 1.3 - Stakeholder Community Hub (SC-HUB) Version 1

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0.1	11 June 2025	Table of Contents and initial structure
1.0	11 June 2025	First draft submitted for consortium review
1.1	16 July 2025	Second draft after internal review
1.2	24 July 2025	Final version

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Abbreviations

Abbreviation	Meaning
AAI	Authentication and Authorization Infrastructure
CARMINE	Climate-Resilient Development Pathways in Metropolitan Regions of Europe
CSA	Case Study Area
D	Deliverable
LL	Living Lab
SC-HUB	Stakeholder Community Hub
SCP	Socio-Cyber-Physical
SDGs	Sustainable Development Goals

Executive Summary

The Deliverable (D)1.3 Stakeholder Community Hub (SC-Hub) presents the current release of the Stakeholders Community Hub (SC-HUB) tool, as an instrument for facilitating the collaboration and interaction among Living Labs' stakeholders and enabling the digital representation of Living Labs. D1.3 is of type "Other", and this document accompanies the deliverable and presents the main functionalities of the current released version of the tool, which is accessible through: <https://schub.carmine-project.eu/>.

1 Introduction

Deliverable 1.3 (D1.3): “Stakeholder Community Hub (SC-HUB)” is related to Task 1.3: Stakeholder Community Hub: Online Living Lab Tool, that works on developing and making available an online web tool, to facilitate the collaboration and interaction among Living Labs’ stakeholders.

The first version of the SC-HUB has been released ahead of schedule to support all Living Lab (LL) activities. The first version, released in October 2024, provides an intuitive, user-friendly platform that promotes knowledge exchange, open innovation, and co-development, increasing impact, encouraging adoption of outcomes, and ensuring sustainability beyond the project’s end.

D1.3 is a deliverable of type “Other”, and this document accompanies the release of the tool, which can be accessed and is already exploited by the CSAs through the following link: <https://schub.carmine-project.eu/>. As Figure 1 presents, the deliverable starts with an introduction (current section), continues with the description of the current available, released functionality and ends with the plans of the upcoming releases.



Figure 1: Deliverable 1.3 structure

2 The SC-Hub available functionality

The SC-HUB tool is designed to address the gaps and shortcomings identified in the operation and realisation of LLs. Its objective is to improve and facilitate the engagement of participants, as well as the dissemination and uptake of outcomes and conclusions. The SC-HUB concept and functionality are based on the idea of supporting LLs activities during the lifetime of the LLLs and beyond their operation. It serves as an online tool that continuously assists LLs organisers and participants, as well as external users interested in the work produced by each LLs. It fosters collaboration and opinion exchanges outside the physical borders of LLs, ensuring continuous access to material and information by providing an online collaboration space for interaction. Finally, it facilitates knowledge exchange and experiences between the different LLs.



Figure 2: SC-Hub Landing Page

SC-Hub is an online tool (Figure 2 presents the landing page of the tool) that adopts by design a domain-agnostic approach. It aims to create a framework that can accommodate and digitally represent any LL, regardless of its application domain or offline methodology.

A set of core functionalities has been integrated into the first version of the tool and is presented in the following sections. Additional features will be developed and added over time to meet the needs of the eight CARMINE LLs and support their long-term sustainability.

The first 5 LLs have already created their digital instance using the tool (Figures 3-4), and the rest will work on this in the near future.

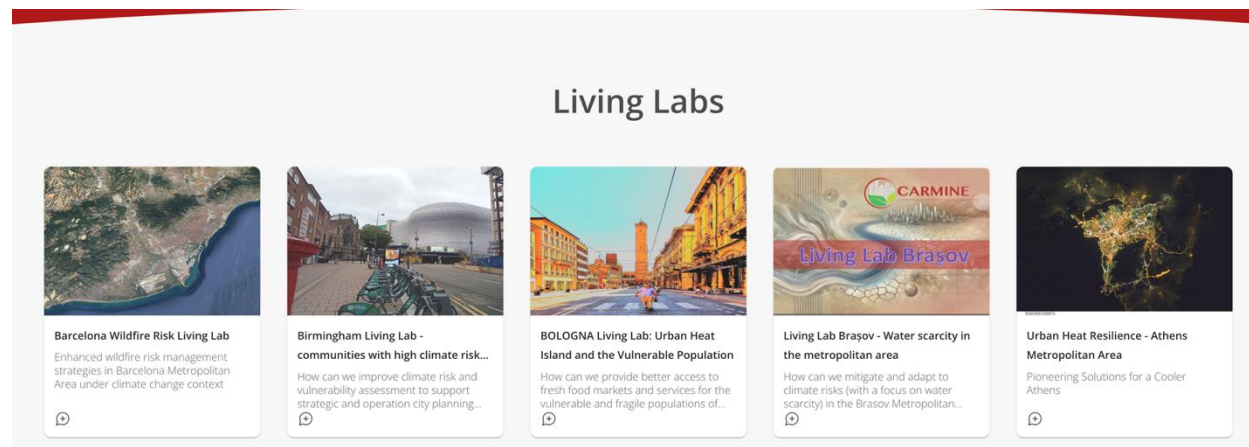


Figure 3: CARMINE LLs in the SC-Hub tool

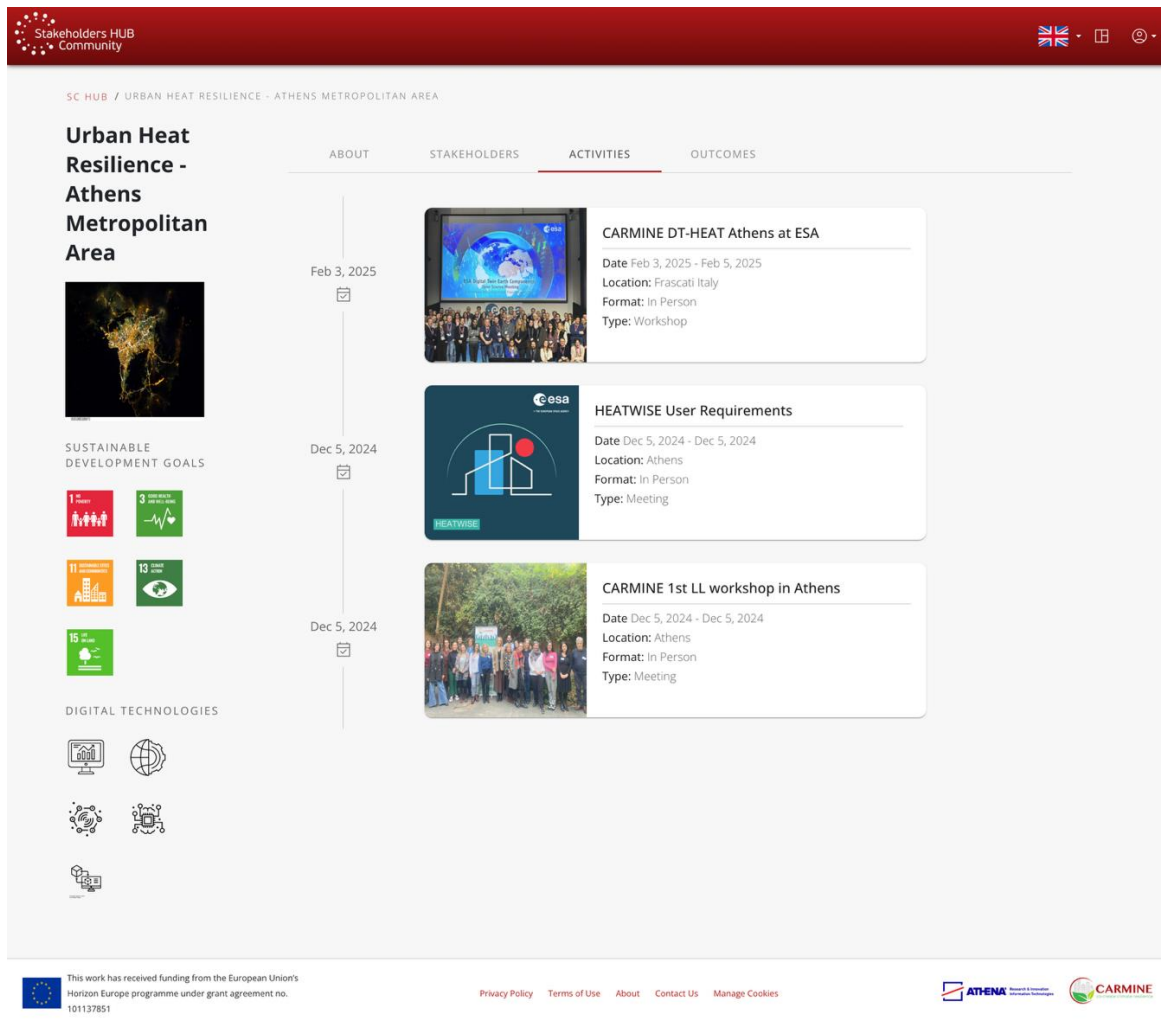


Figure 4: Athens LL instance in the SC-Hub tool

3 Released functionality

The current released version of the SC-HUB has been made available with a set of core functional modules, some of them being mandatory while others are optional. The selection of the optional modules to be used in each LL is decided by each LL organiser and can be changed at any time during the exploitation of the tool.

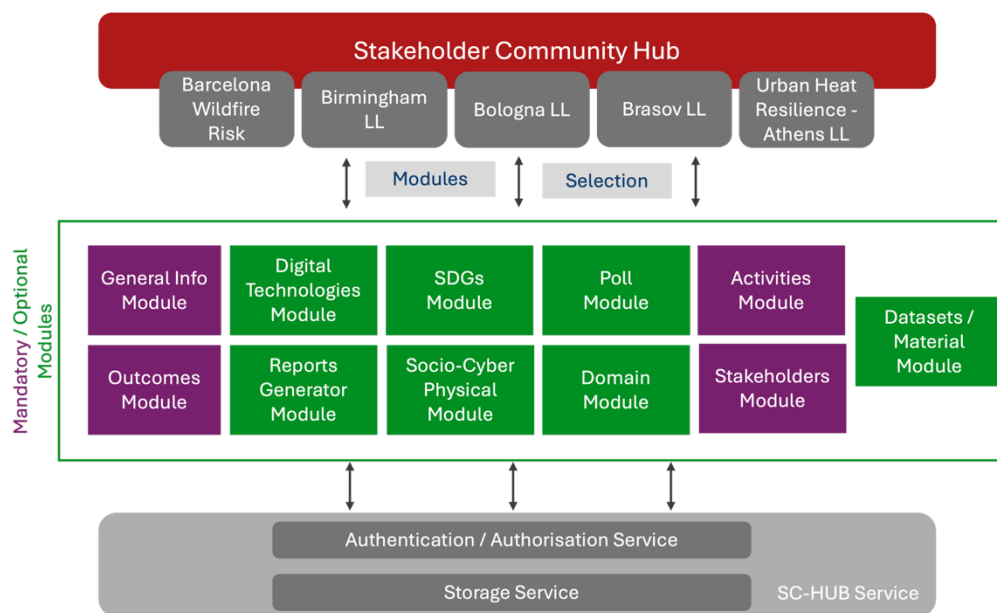


Figure 5: SC-HUB Block diagram & functional modules

The current released functionality includes the following functional modules and functionality (Figure 5):

- **Mandatory modules**
 - Digital representation of a LL, by providing a set of general descriptive information: LL name, description, focal issue, location.
 - Stakeholders' list and attribute details and the option to bulk upload a list using a CSV file.
 - LL activities and planning.
 - LL main outcomes.
- **Optional modules**
 - Module for uploading relevant material or datasets and/or link relevant URLs.
 - Relevant Digital Technologies and UN Sustainable Development Goals (SDGs).
 - Initiation of polls for stakeholders and members. Enables LL organisers to receive members' opinions on an important aspect relevant to the LL activities.
 - Modelling of the LL entities using the Socio-Cyber-Physical (SCP) approach.
 - Domain module for LL categorisation and classification.
- **Core services**
 - Automatic report generation.
 - Users and membership management.
 - Multilingual support. Currently supporting English, Greek, Romanian and Catalan.

The distinction between mandatory and optional functional modules allows each LL to choose the features that best suit their specific needs. At the same time, mandatory modules ensure a

minimum level of information is provided across all LLs, maintaining consistency and completeness.

Description of each functional module

The core functional modules of the SC-HUB are detailed below:

LL General Information

This module implements the basic descriptive information, mandatory for each LL. It includes its title, a more detailed description, the main focal question/problem statement and its location. This set of information has been selected based on the most important aspects, according to LL coordinators.

Stakeholders

The stakeholder mapping process is a crucial activity in the initial phases of a LL and impacts the success of its activities. This module supports the recording of the LL's stakeholders by providing a set of descriptive information together with a custom attributes' list that is defined per LL and their categorisation as a main stakeholder, who is deeply involved in the operation and organisation of the LL, or as a contributor. The custom attributes provide flexibility and support the analysis of the stakeholders based on what matters most for each LL. A common list of attributes can be used across the CARMINE LLs to enable the mapping of the stakeholders and their analysis. Additionally, bulk import of stakeholders' data is supported by uploading a CSV file following a specific scheme.

Activities

The activities module allows LLs to plan and keep track of their activities & events in a fine-grained manner. Exploiting this module, the LL organiser can make available in one place all the important information of a planned activity and ensure that all participants are informed before it takes place. In addition, the module supports the upload of the outcomes of each activity, thus ensuring that all the actions are recorded and made available to its members and other stakeholders.

Outcomes

It is already stated that LLs often fail to externalise their actions and outcomes, limiting their visibility and their potential to be extended outside their initial boundaries. Exploiting this module, a LL can make available all its outcomes and lessons learned, including descriptive information and files for each outcome, and present it in one place, easily accessible by anyone.

Material / Datasets

This module allows the LL organisers to upload datasets, files and other material and/or link external sites through URLs that are relevant for the LL. This module aggregates the important material in one place and makes it available to its members.

Digital Technologies

This module presents the Digital Technologies that are frequently used by LLs, based on the work conducted within the Horizon 2020 DESIRA project, to identify digital technologies that can be game changers [Bacco et al., 2020]. Each LL can select all that are relevant to its activities. This is an important information for LLs, considering the contribution of digital technologies in the digital transformation and twin (green and digital) transition. This module can be extended to include additional Digital Technologies that are used by the LLs in a specific context.

Currently and for the CARMINE project, this module refers to the following Digital Technologies: Digital Twin, Artificial Intelligence, Distributed Ledger (Blockchain), Local and remote sensing, Web-based technology, Social media and Social Networks, Data Analytics, Cloud/edge computing, Autonomous Systems and Robotics, Augmented Reality / Virtual Reality and 3D printing.

SDGs

The activities of a LL are geared towards the achievement of the SDGs, this module enables the option of selecting the relevant SDGs of a LL and it also provides the option to describe the initial and the future impact, after completing the LL activities and producing its outcomes, the LL has on each SDG.

Poll

Enabling the interaction with the members of a LL, the module provides simple polls and open questions, enabling the collection of opinions on issues that are important for the LL and ensuring the fair participation of all its participants, facilitating their engagement and exchange of experiences. Polls support the co-design process of certain solutions.

Domain

This module allows the categorisation of LLs based on a specific classification. The classification can be imported and updated by the system administrators to support the different requirements of the users and the supported domains.

Socio-Cyber-Physical System

A Social-Cyber-Physical System (SCPS) involves the interlinking of the cyber, physical, and social domains within a system-of-systems mindset. The SCPs module supports the modelling of a system through the SCPs approach by defining the distinct entities and their interactions [Metta et al., 2022]. This module offers a representation of the interlinkages between the systems. Similarly to the previous module, it provides useful information as part of the systemic approach to connect digital and physical entities to address a challenge in its entirety.

Reports Generator

This module auto-generates a report that includes all information related to the LL activities. This way, it improves efficiency in sharing among interested parties, facilitates knowledge exchange, saves time and effort when it comes to the documentation of activities and contributes to the sustainability of the LL work.

4 Core Functionality

Beside the end-user functional modules, the tool has a set of core functionalities, which support the usage, operation and maintenance of it. These include:

Single Sign-on with external providers

External Authentication and Authorization Infrastructure (AAI) authentication is enabled, allowing users to sign in to the tool with their existing accounts. Google and OpenAIRE's AAI are the supported providers. OpenAIRE AAI enables user authentication with educational accounts (EduGAIN), Google, LinkedIn, GitHub and ORCID. For more information visit: <https://catalogue.openaire.eu/service/openaire.aai/overview>

Users' roles management

SC-HUB design incorporates the concept of roles, based on which, users are enabled with a specific set of permissions allowing them to manage, edit or view information. Two categories of roles exist: 1) Application roles and 2) LL membership roles.

1. Application roles

- a. Application's administrator: A user who can manage and configure the SC-HUB tool. The Administrator can de-activate and/or delete any existing LL.
- b. LL Organiser: this role is assigned to any user after the initial login to the application. Users can create their own LL, and request to become members of other published LLs.

2. Living Lab membership roles

- a. LL Owner: The user who has initially created the LL. The only user that can delete an existing LL through the application.
- b. LL Member: A Member of the LL can view existing information, participate in polls and view members' only content.
- c. LL Facilitator: A user that has all the functionalities of a member and can manage the content of the LL, including the upload of new information.
- d. LL Administrator: A user with all the functionalities of a Facilitator and can manage (add,remove and manage requests) the users of a LL.

To manage the user roles, we utilize the necessary permissions on an App and LL level that dictate if a user can view or modify a resource. We then synthesise these permissions into roles.

Entities Management

The SC-HUB manages a set of entities that are used by the LL instances. These entities can be moderated by the application's administrator and include: the stakeholders list, the entities used through the SCP functional modules, the list of Digital Technologies and SDGs. All mentioned entities can be managed and configured. Especially for the stakeholders list, the administrator can change the visibility of a specific stakeholder enabling the usage of the same entity across the different LLs.

Living Lab Visibility

Different statuses for each LL provide flexibility to its users to decide who and when can access the available information. The following statuses exist:

- Published/Unpublished: Initially the LL is unpublished and only its owner has access to the available information. When the owner publishes it, the members of the SC-HUB can see it as available on their dashboard and request to become members.
- Public: If the owner marks the LL as public, the LL becomes available/visible also to the tool's guest users (no account is required) and they can view its public information. This includes all available information, except the ones marked as accessible only by LL's members (activities, polls, etc).

User Profile

A User profile page is accessible to each user. It presents the information available for each user and some additional attributes including the preferred language, the origin country, the organisation and its role to it.

Users Management

An administrative module for viewing and managing the application's user's basic data.

Living Labs Management

The application's administrator can manage all the available LLs and edit their information, temporarily deactivating them and/or deleting them. This functionality allows the administrator to moderate the provided content and avoid publishing inappropriate or abusive content and data.

The tool provides information for each LL as provided by the LL owners and facilitators. ATHENA RC team, as the maintainer and administrator of it, is not responsible or liable for any false, inaccurate, inappropriate, or incomplete information presented herein. Users exploiting the tool, agree with the provided Terms of Use available at: <https://schub.carmine-project.eu/llm/#/llm/terms-of-use>

5 Upcoming Functionalities

The development and further enhancement of the SC-Hub is an ongoing activity, and new functionalities are already planned to be released with the upcoming versions of the tool. At the time this report is being written, the following functional modules are being implemented:

Posts - Comments

A module that allows the members of a LL to submit a post and receive comments and reactions. Users can initiate a discussion by submitting new posts and interact with other members or submit read-only posts for informative posts.

News

A news module is designed for the LL facilitators and supports publishing news items to the members of the LL, informing them about important activities and milestones.

LL members' home page

In addition to the above modules, a new Home page for the members of a LL is under development aiming to offer a space/dashboard for all members of a LL to discuss, exchange ideas and information and instantly be informed about the important activities and events of the LL.

6 Conclusions

D1.3 presents the current available release of the SC-Hub tool. The tool is continuously updated with additional functionalities and bug fixing. Release notes and information on the current released version are available through the following link: <https://schub.carmine-project.eu/llm/#/llm/about>

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