

D7.4. Project open platform



Deliverable Information Sheet

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1.1		Contribution to the first version	Aifor
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2.1		Version for first consortium check	Spindox Labs
2.2		Final version	Ecoserveis

List of Acronyms

COP	COMANAGE Open Platform
DSS	Decision Support System
EC	Energy Community
LLM	Large Language Model

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Keywords list

- Open platform
- Digital Hub
- E-learning platform
- Decision Support System

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1. Executive summary

This report describes the architecture and process of creation of the basic version of the **COMANAGE Open Platform (COP)**. This report lays the ground for the further works needed to improve the COP. In the upcoming months new components will be designed, implemented, and integrated in the COP. The COP is composed of 4 main components:

- The Energy Community Governance Toolkit
- The Digital Hub
- The Decision Support System (DSS)
- The E-learning platform

The objective is to reach a stable version of the COP at M20 when also the last component the Decision Support System (DSS) will be completed. Input for improvement and suggestions from the final users will also come from the activities run in the other work packages (WP2, WP3, and WP4) throughout the project, as well as from the evaluation and impact assessment (WP5).

2. Introduction

The COMANAGE Open Platform (COP) collects all the contents and tools developed within the project and is useful for external stakeholders to boost the creation of energy communities (EC). The COP is composed of 4 main components:

- The Energy Community Governance Toolkit
- The Digital Hub
- The E-learning platform
- The Decision Support System (DSS)

The current deliverable provides more details about the Digital Hub (due to M12). The other components will be developed after the requirement collection. Therefore, a detailed description of the Decision Support System (D4.2) and the E-learning platform (D4.1) will be provided in the respective deliverables.

2.1. COMANAGE Architecture

Since M1, SPXL focused on the definition of the overall architecture as resulted in **Figure 1**. The consortium decided to create a unique entry point for reaching the project website and the COP.

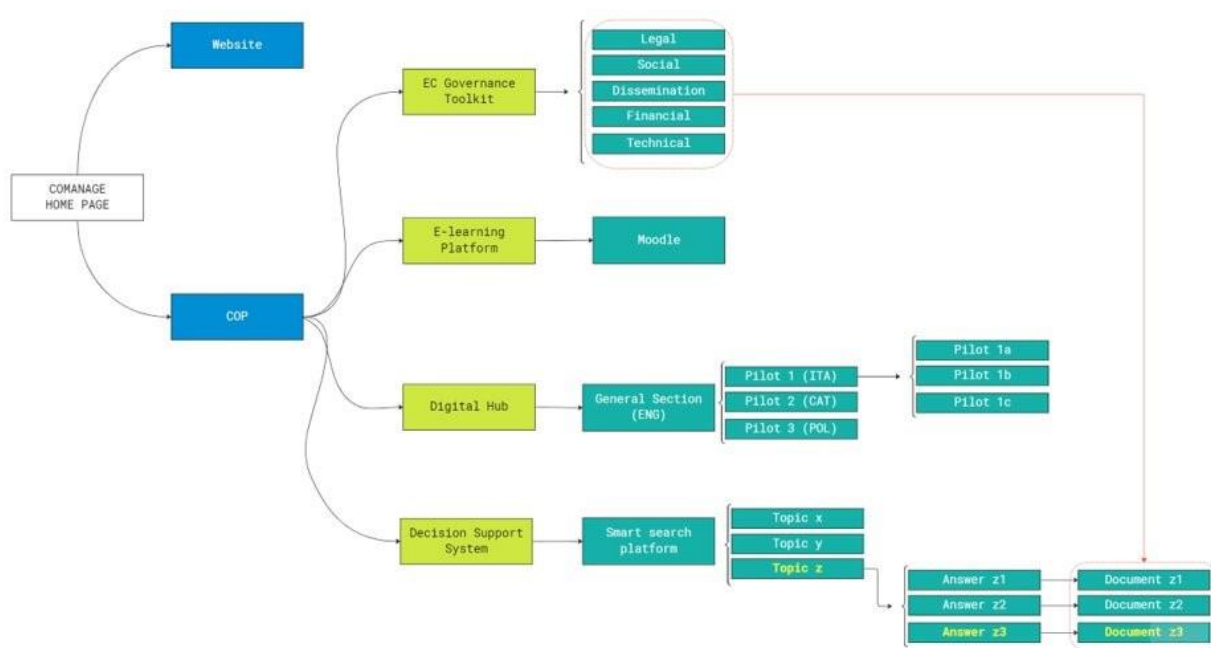


Figure 1 COP Architecture

A peculiarity of the COP is that it will display content based on language: users will be redirected directly based on browser language, but they can also switch languages between the ones available in the platform. Contents will be tailored and translated into four languages (English, Italian, Polish, and Catalan). Tailoring refers to different content created ad-hoc based for example on local policies, local documents, etc.

The platform is a cloud platform hosted on Amazon AWS. AWS (Amazon Web Services) is a comprehensive, evolving cloud computing platform provided by Amazon that includes a mixture of infrastructure-as-a-service, platform-as-a-service, and packaged-software-as-a-service offerings. AWS services can offer an organization tool such as compute power, database storage and content delivery services. Spindox Labs is partner of AWS and exploit it for deployment of applications. For COMANAGE, AWS is used to host the comanage website, the comanage open platform and all other tools developed during the project.

2.1.1. Development timeline

When developing the COP, the first components to be addressed were the Website (comanage.spindoxlabs.com) and the Digital Hub respectively due to M6 (D7.2) and M12 as shown in the timeline.

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	
Open Platform												D7.4																									
Website						D7.2																															
Digital Hub												A																									
DSS																					B																
E-learning platform																	C																				

Figure 2 Timeline for the development of the Open Platform

Legend:

- D7.2: Comanage Website
- D7.4: Open Platform Architecture
- A: Digital Hub ready to use by stakeholders
- B: Decision Support System (first version)
- C: E-learning platform ready and integrated in Open Platform
- D4.2: Decision Support System (final version)

As previously mentioned, the other components of the COP will be developed along the project and will be integrated as they are ready to use.

2.2. Comanage Home Page

As described in the architecture (**Figure 1**), the consortium decided to have a common homepage to access either the project website (see D7.2) or the COP (**Figure 3**). For convenience the address to this homepage will remain the same as the website (comanage.spindoxlabs.com). The consortium decided to create this subdivision because the Website and the COP offer content dedicated to different visitors and stakeholders interested in Energy Communities. In the case of the website, the users are more interested to know about the project as a whole, regarding the consortium partners, the main activities and actions done, and its main outcomes; whereas the COP has a more operative goal and is therefore intended as the main result of the

project and a tool to be used by stakeholders who need information about Energy Communities, either to promote new ones or to guarantee the long term sustainability of existing ones.



Figure 3 *COMANAGE Home Page*

3. Requirements

The COP has been designed following an iterative process of collecting feedback both from the partners and the users. SPXL chaired two brainstorming sessions:

1. Project meeting in Athens (M8)
2. Online meeting (M11)

Beyond these two plenary sessions, 1-to-1 meetings were organized with the partners to get their suggestions about the COP, considering the input gathered by the pilot partners from the Hub meetings organized by each of them.

3.1. Brainstorming session in Athens

The first set of feedback was collected during the project meeting in Athens (M8). SPXL led a brainstorming session to gather requirements for the definition of the Digital Hub (DH). The above-mentioned structure was discussed together with the Hub managers and information was collected specifically regarding the users (e.g., who will access the DH, login needed etc.), the roles and resources needed, and other technical features Hub Managers would like to have.

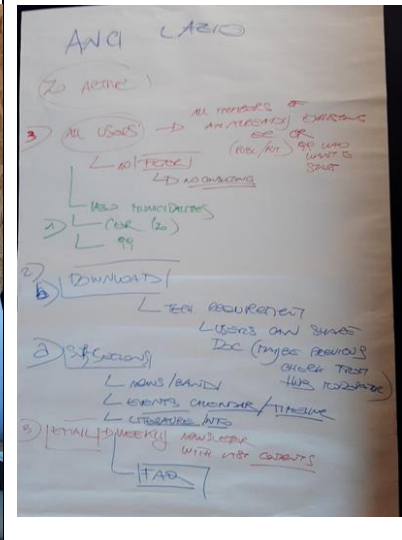
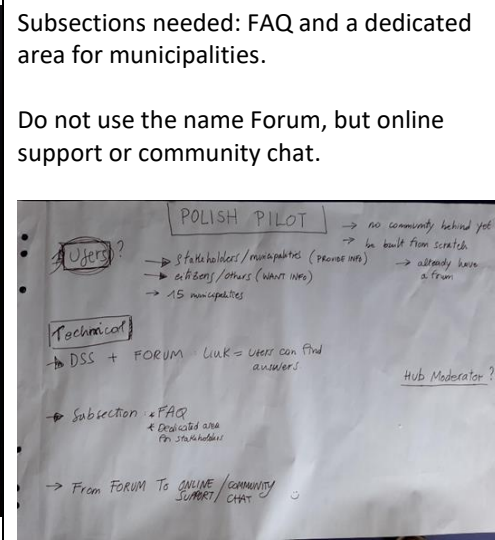
BARCELONA AREA	LAZIO AREA	KRAKOW AREA
Need to merge with existing services like support services and other municipality forum: La Teulada is a service mentioned by AMB.	A place for upload-download documents different from EC Governance Toolkit. Can have more subsections: News; Grants; Events; Literature; FAQ.	Users: are those who provide info (policy makers and municipalities) and those who require info (citizens, stakeholders, others) Already has a forum of 15 municipalities. Digital hub should be linked to the DSS so users can find answers to their questions.
		

Table 1 Key results from the brainstorming session

The following questions were asked to the participants:

1. Who are the users?
2. How do you imagine your pilot?
 - a) Do you need other sub-sections?
 - b) One section where users can download something?
3. Do users need to register to access the Digital Hub?
 - a) Any other requirements?
4. Is the Hub Manager also the Hub Moderator?
 - a) Resources (tech and human) to manage Digital Hub

Table 1 shows the key results of the session in Athens. Each pilot provided insightful suggestions mostly based on the level of maturity. For example, Krakow, which is the less mature pilot, focused the discussion on users, while the other pilots considered other higher-level aspects such as the integration with existing services and practical features that the COP should provide.

3.2. Brainstorming session online

In September 2023, SPXL and ECO organized a second brainstorming session online. The session was held using mural app¹ and online application allowing the exchange of ideas by using virtual post-its. The session was dedicated to show the partners the first version of the COP and the Digital hub, with the integration of the requirements collected in Athens and gather other feedback.

¹ <https://app.mural.co/t/ecoserveis0420/m/ecoserveis0420/1696405090106/426a76bfa7239c221cfa6179f3c94f81bcc000b1?sender=0b83be24-8240-407a-b8b4-378de41c4907>

Comanage Open Platform						Digital Hub					
	Structure & layout	Usability	Things to improve/review (i.e. bugs)	Data collection needs	Others		Structure	Content	Usability	Things to improve/review (i.e. bugs)	Others
AMB						AMB					
ANCI						ANCI					
KMA						KMA					
Revolve						Revolve					
Metropolis						Metropolis					
Anese						Anese					
Ecoserveis						Ecoserveis					
Aisfor						Aisfor					
CoopAbility						CoopAbility					

Figure 4 Board used for brainstorming session

During the session, partners were asked to provide their comments on specific points of the COP in general and on the Digital Hub, specifically:

- *Structure and layout*
- *Usability*
- *Things to improve*
- *Data collection needs*
- *Other issues*

In general, the partners were satisfied with the current state of the art of the COP. They suggested further improvements, which have been prioritized and will be progressively implemented in the upcoming months when also the other components of the COP will be ready for integration (following the implementation timeline above, Figure 2).

As for the other components of the COP, even if the specific tasks have not started yet, SPXL has started to discuss with the partners about the definition of the e-Learning platform (T4.1) and the Decision Support System (T4.5). This was needed mostly for the definition of the architectural requirements of the COP.

In the next sections, an overview of the main sections of the COP is described.

4. Comanage Open Platform

The Comanage Open Platform includes all tools and materials developed during the project. The idea is to create a place where citizens, municipalities, government, and all people interested in energy communities could find useful information and have a discuss place with and between communities.

As shown in **Figure 5**, on the COP home page users can find the link to the main components of the COP which are: Digital Hub, e-Learning platform, the Decision support system, and the Energy communities governance toolkit. The default language of the COP is English.

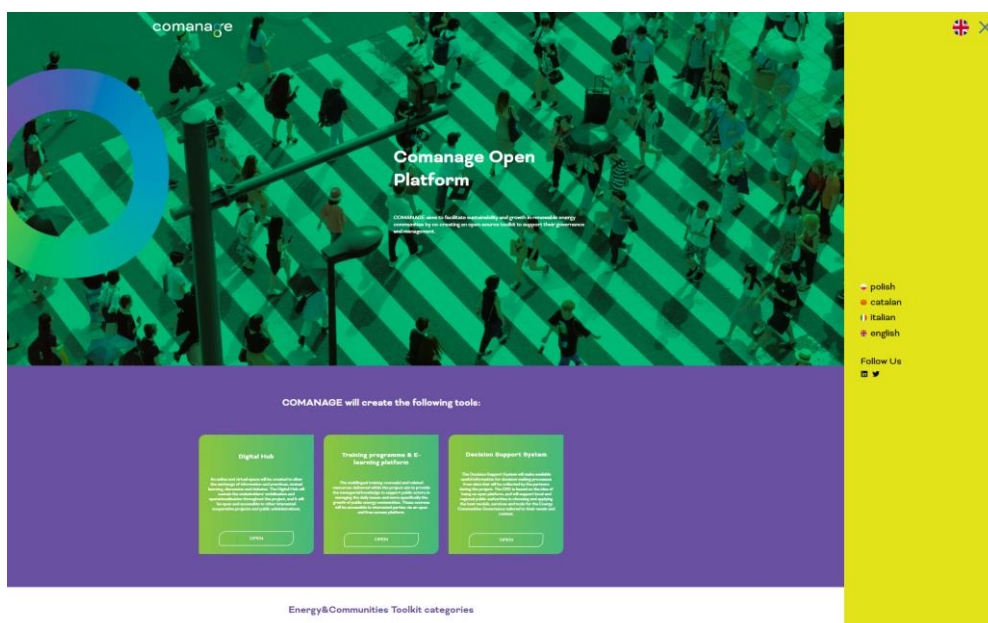


Figure 5 COP Home page

4.1. Energy Communities Governance Toolkit

ECG Toolkit is a section where all documents that could be useful to create and manage Energy Communities will be uploaded. As described in D2.3, contents of the ECG Toolkit are divided into 5 categories: Legal, Social, Dissemination, Financial, Technical (**Figure 6**).

Different content formats could be included in each category (e.g., documents, images, video). All content is tailored and customized according to the language. 4 main languages are considered (ENG, ITA, CAT, POL) when a user selects one of those contents the language changes. This means that for example, if an Italian is interested in legal aspects, by clicking on the Legal section of the ECG toolkit, he/she will access a list of documents explaining legal aspects in Italy and displayed in Italian language.

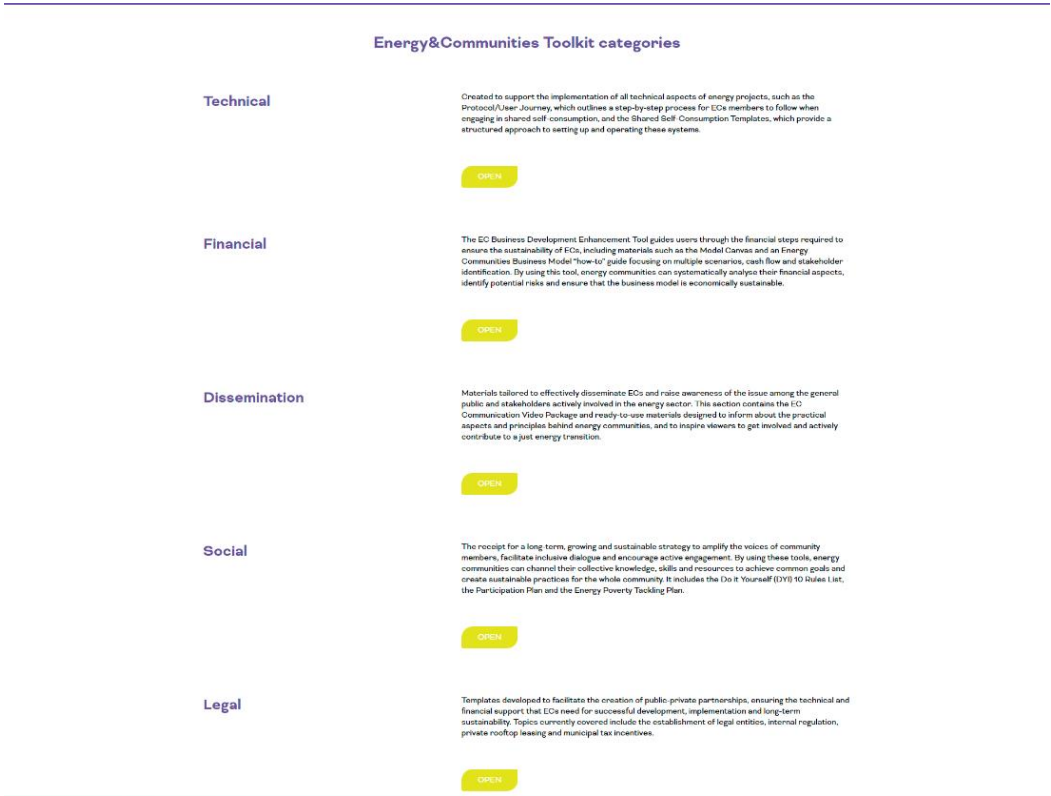


Figure 6 Energy communities governance toolkit

As shown in **Figure 7** media contents are displayed with a small preview. Other documents are listed and can be downloaded. All documents can be tagged with specific labels to help their search and categorization.

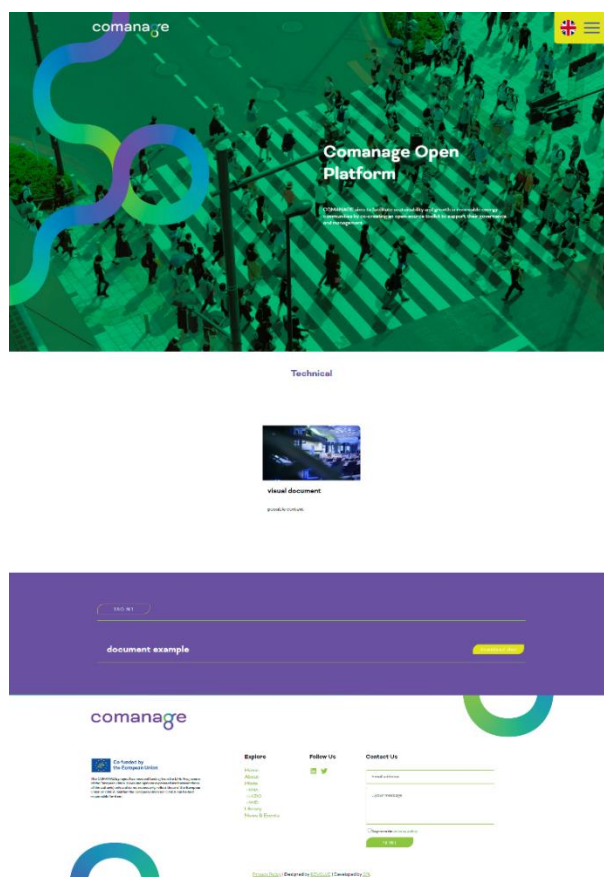


Figure 7 ECG Toolkit subsection

4.2. Digital Hub

The Digital Hub (DH) is an online and virtual space to exchange information and practices, mutual learning, discussion, and debates. The DH is composed of 4 main sections: one general section in English and one section dedicated to each pilot in their specific language (see **Figure 8**). Inside each category a subset of discussion topics is present, where users can find useful information, ask questions, and participate in discussions. Specifically, in the General Discussion section users can easily start different threads of discussion (see **Figure 9**). In the sections dedicated to the pilots, the subsections are: General Discussion, Resources, FAQ, Events (see **Figure 10**).

Users do not need to register to browse and read the contents in the Digital Hub. However, they must register if they want to contribute. Hub managers will be appointed as moderators and will manage both the content and discussions.

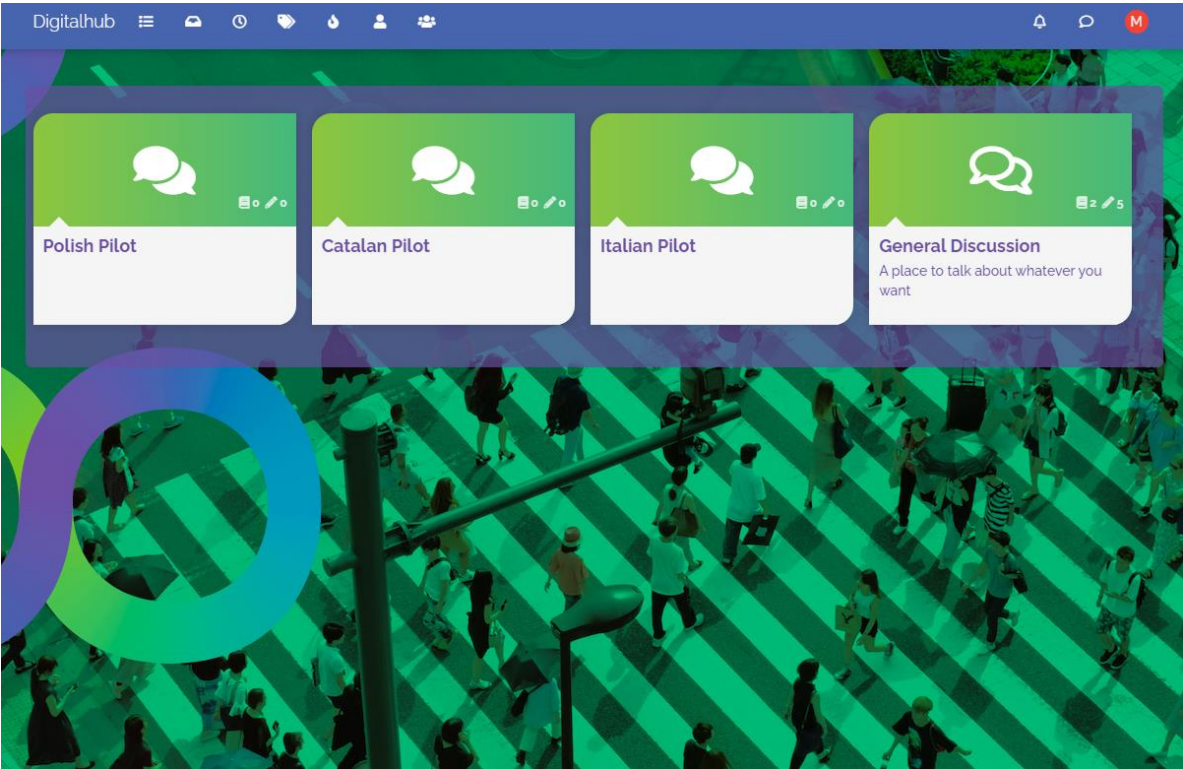


Figure 8 Digital Hub main page

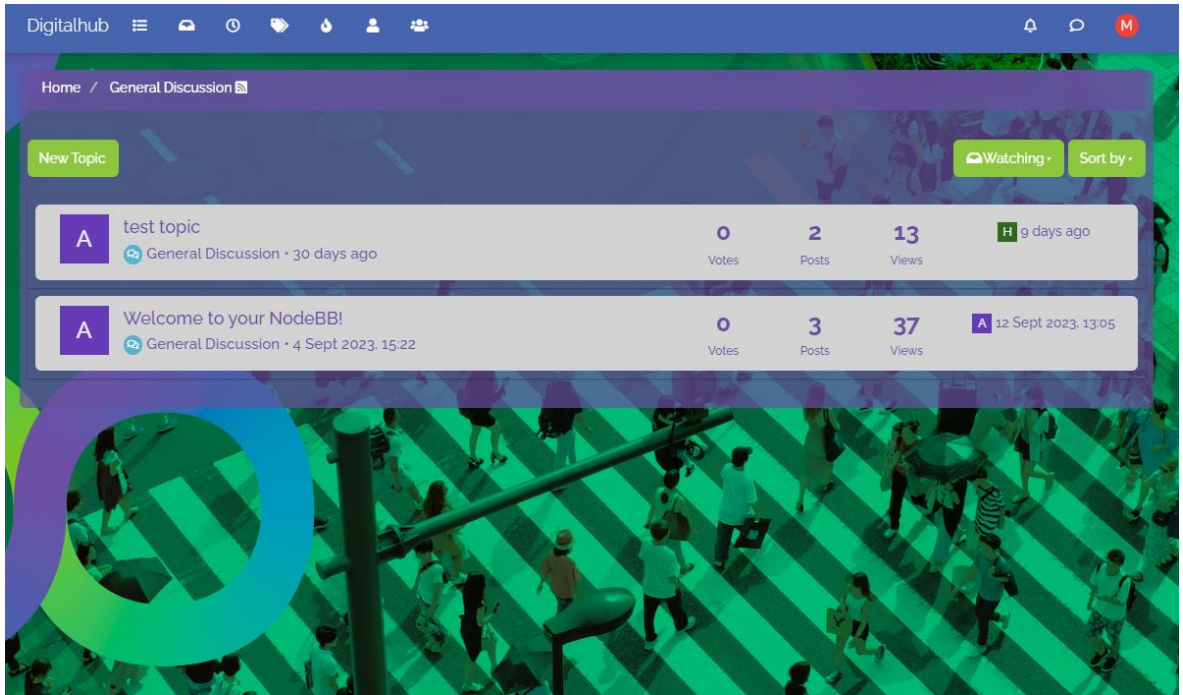


Figure 9 Digital Hub: General Discussion section

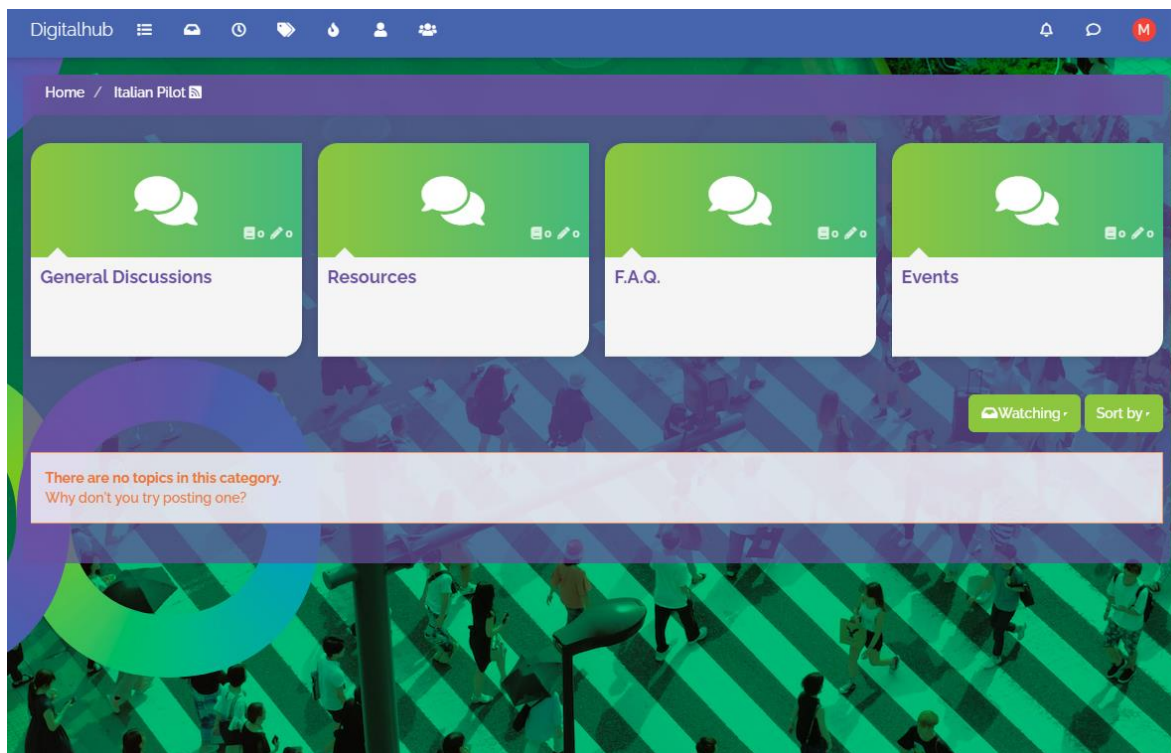


Figure 10 Pilot Section

4.3. E-learning platform

The primary goal of the platform is to develop a versatile instrument that caters to diverse learning styles and preferences. The platform targets all kinds of learners seeking to enhance their knowledge about ECs. By offering a range of courses, interactive forums, and a user-friendly interface, it aims to foster a dynamic and collaborative learning community.

The initial draft of the Moodle page layout has been created, focusing on a clean and intuitive design to optimize user experience (**Figure 11**). A comprehensive course structure, including all lessons and learning materials, has been developed and will be uploaded soon, ensuring a well-organized and engaging curriculum for the target audience, moreover, additional features, such as a discussion forum for collaborative learning, a structured database for storing essential resources, and a feedback section for continuous improvement, has been integrated into the platform.

The page layout will be refined to ensure an intuitive and visually appealing interface, integrating feedback from users. Ongoing testing and improvement based on users' feedback will be a priority, fostering continuous enhancement of the platform's usability. Regular updates and maintenance will incorporate emerging technologies to ensure a cutting-edge user experience. Challenges include seamless integration of the forum, database, and feedback sections, which will be addressed through meticulous planning and development. Adapting the platform to accommodate diverse learning styles and accessibility requirements is a priority, with a focus on inclusive design and accessibility standards.

A registration to the platform is required (**Figure 12**).

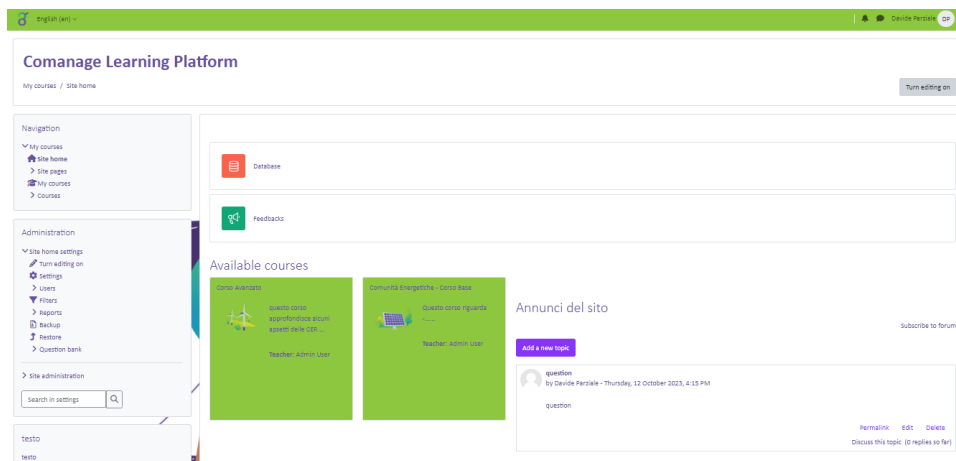


Figure 11 eLearning Platform Homepage

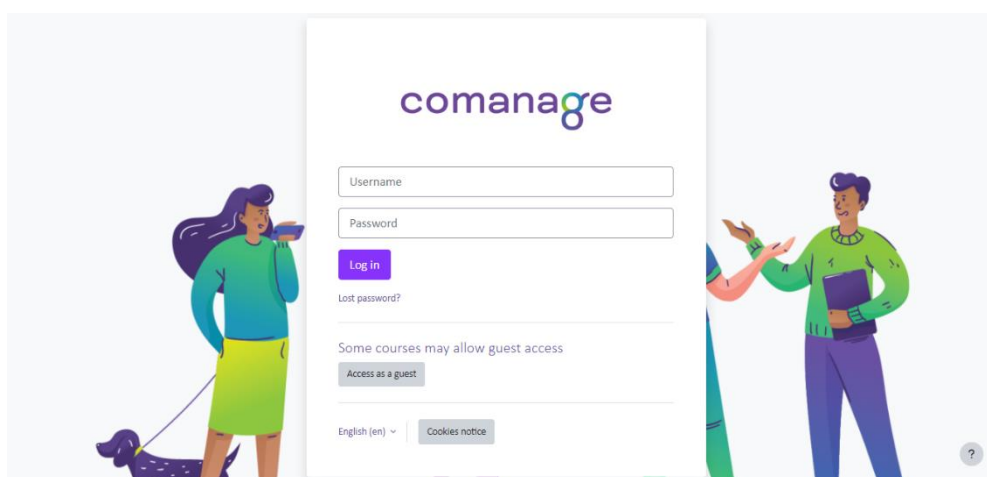


Figure 12 eLearning Platform Login page

4.4. Decision Support System

The Decision Support System (DSS) should support users and policy makers in extracting useful information from the contents stored in the COP. Using the Large Language Model (LLM)² and other techniques, large documents in different languages can be parsed. The DSS can generate a response and link the related documents where it finds the information. This way, from a set of documents available in a shared folder, the DSS can automatically find the answers to related questions (**Figure 13**).

² A large language model (LLM) is a type of language model notable for its ability to achieve general-purpose language understanding and generation. LLMs acquire these abilities by using massive amounts of data to learn billions of parameters during training and consuming large computational resources during their training and operation. [Wikipedia].

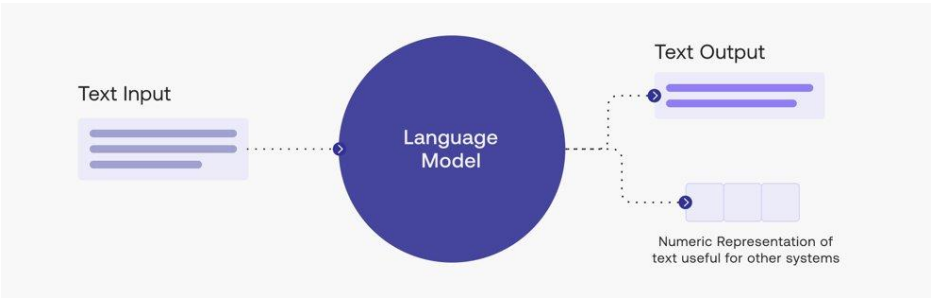


Figure 13 DSS functioning

During the brainstorming session in Athens, partners agreed to consider the DSS as a place where users can get answers on specific topics linking, at the same time, to the place to find further information. Based on this SPXL drafted the following concept (Figure 14).

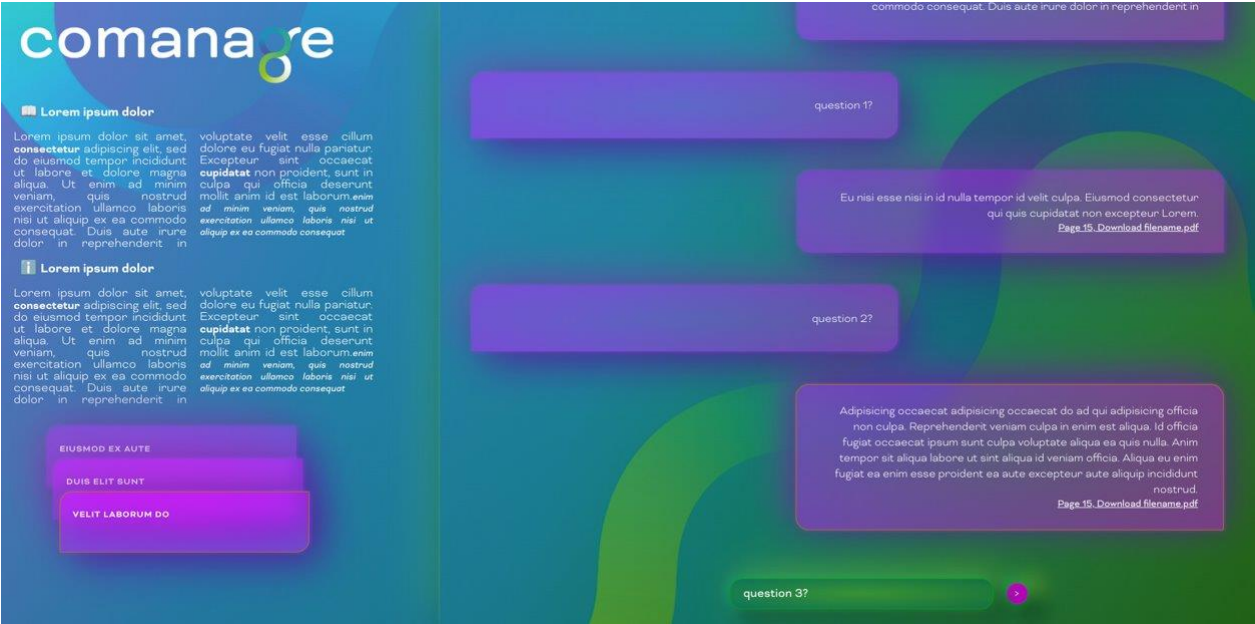


Figure 14 DSS Concept

5. Conclusions

The COMANAGE Open Platform (COP) acts as the one crucial tool for all stakeholders who want to find support and information about the creation and sustainability of energy communities. What is described in this report is the basic version of the COP, which will be completed with all its components at M30. The COP will be in fact iteratively refined thanks to the feedback collected from the stakeholders and will be continuously updated with the training materials and other contents generated by the partners and the pilots of COMANAGE along the project. The current deliverable provides more details about the Digital Hub (due to M12). The other components will be developed successively in the project, therefore, a detailed description of the Decision Support System (D4.2) and the E-learning platform (D4.1) will be provided in the upcoming deliverables.