



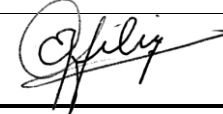


H2020 - EEB - 2017 - 766464 – SCORES

Self-Consumption Of Renewable Energy by hybrid Storage systems



## Report on Training Activities

	Name	Signature and date
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## Distribution list

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## 1 Background

This deliverable (D.9.8) sums up the training activities organized, produced and conducted within the task 9.4. The tasks main objectives were to perform training activities, exploiting instructions, processes and tools developed in the framework of the Project and distribute them to a wider community of professionals, relevant for the production, design, application and Installation, supporting activities included videos, seminar, webinar and a course.

This document was compiled by IPS and has been reviewed by the partners within the SCORES program before publication.

## 2 References

### 2.1 Applicable Documents

	Document	Reference	Issue

### 2.2 Reference Documents

	Document	Reference	
RD-01	DoA: EeB-06-2017 - SCORES - Part B		
RD-02	D 9.2 Communication and Dissemination Plan	EN-SCORES-RP-041	



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### 3 Terms, definitions and abbreviated terms

ADENE	Portuguese National Energy Agency
AHPP	Air Air Heat Pump with PCM
BEMS	Building energy management subsystem
DoA	Description of Action
EPBD	Energy performance of buildings directive
PCM	Phase Change Material
RP	Report



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## 4 Executive summary

This document describes the training activities developed in the SCORES project in task 9.4 Training Activities of the WP9 Dissemination and exploitation of results. The training activities developed were the following: Webinar “Innovative renewable solutions for residential buildings”; SCORES Training Course; 8 Training Videos; Training Demo Sites Seminar; Webpage “Training Activities”, “Hybrid Domestic energy systems of the future” final event/webinar – presentation of the training activities.

The training activities were organized to transfer the acquired knowledge to a wide community of professionals who can be involved in the different stages of production, design, application, and installation. The activities were carried out as planned in the DoA, however, some adaptations had to be made due to the pandemic, preferably opting for online activities.

Most of the consortium partners were involved, providing elements for the training activities developed, according to their activities in the project, contributing to the transfer of knowledge to the community of professionals.

The task leader is IPS and the partners who were most involved in organizing the training activities were FEN, RINA-C, EDF and AEE.

## 5 Training activities

### 5.1 Webinar “Innovative renewable solutions for residential buildings”

The webinar “Innovative renewable solutions for residential buildings” was organized on the 25<sup>th</sup> of June 2021, Friday, between 14.00 and 17.00 (CET).

The webinar was organized within the event World Sustainable Energy Days (WSED) 2021, in cooperation with other H2020 projects (HYBUILD and GEOFIT). IPS organized the webinar with support from all partners, and with special support from FEN. The WSED has over 600 attendants each year.

The presentations and presenters of the SCORES project were as follows:

- The SCORES project in a nutshell - Erwin Giling, TNO, NL
- Heating with air heat pumps and PCM storage - Luis Coelho, IPS, PT
- PVT water-to-water heat pumps - Clement Dumont, Heliopac, FR
- Chemical looping heat storage - Pavol Bodis, TNO, NL
- Building energy management system - Hans Hennig, Siemens, NL

The complete program of the event is shown in Figure 1.

### World Sustainable Energy Days Webinar

Innovative renewable solutions for residential buildings

Download the [presentation](#).

The webinar "Innovative renewable solutions for residential buildings" was organized on the 25th of June 2021, between 14.00 - 17.00 (CET). The webinar was organized within the event [World Sustainable Energy Days \(WSED\)](#) 2021, in cooperation with other H2020 projects ([HYBUILD](#) and [GEOFIT](#)). [IPS](#) organized the webinar with support from all partners, and with special support from [FENIX TNT](#). The WSED has over 600 attendants each year.



Figure 1: World Sustainable Days Webinar information on the SCORES webpage "Training"

## 5.2 SCORES Training Course

The SCORES Training Course was organized on the 1<sup>st</sup> of April 2022, Friday, between 9.30 and 17.30 (WET).

The main objective of the course was to train professionals in the area through presentations, technical explanations and discussions of each technological solution developed, made by each partner responsible for the development of the respective technology.

As it is a full-day course to have time to explain in more detail each of the technological solutions, it was decided to take the course physically, choosing a country of the consortium, in this case, Portugal. Course presentations are available so that the course can be replicated in other countries if requested.

The SCORES Training Course took place at ADENE's (National Energy Agency) facilities in Lisbon. ADENE collaborated with IPS in the organization of the course, made its facilities available to carry out the course and disseminated the course on its webpage and its social networks.

ADENE is the national energy agency responsible for the Building Energy Certification System based on the transposition of the EPBD directive into Portuguese legislation. ADENE develops activities of public interest in the area of energy and its interfaces with other sectoral policies, in articulation with other entities with responsibilities in this field, including energy efficiency in mobility and water efficiency. ADENE has an academy that organizes training courses for professionals in their respective fields to increase their competencies and qualifications in the areas of energy certification of buildings, energy efficiency, renewable energies, water efficiency, efficient mobility and international certification. It is considered that this collaboration was very important to promote the course among professionals in the field and to give visibility to the course and the SCORES project and their respective solutions.

The course program is shown in Figure 2. Figure 3 shows the dissemination of the course on the webpage of the ADENE and Figure 4 shows the Moodle platform used by ADENE to interact with the trainees of its courses where the course presentations are available. Figure 5 shows Dissemination of the course on the SCORES webpage in section "Training".

## TRAINING COURSE ON THERMAL ENERGY STORAGE FOR HEATING, COOLING AND DHW FOR BUILDINGS



REGISTER HERE

1st of April, 2022  
09:30 - 17:30 WET

### AGENDA

TIME	TOPIC	SPEAKERS
09:00 - 09:10	Welcome	IPS, ADENE
09:10 - 09:30	Introduction to the SCORES project	TNO
09:30 - 09:50	The implementation of the EPBD and the Portugese case	ADENE
09:50 - 10:30	Different energy storage solutions and their importance for the decarbonization of buildings	IPS, TNO
10:30 - 10:50	Coffee break	
10:50 - 11:30	Electro Thermal storage units for heating using PCM, design, installation, and operatio	CAMPA
11:30 - 12:10	Air to Air Heat Pumps using PCM storage, design, installation and operation	France Energie
12:10 - 12:30	Q&A	
12:30 - 14:30	Lunch	
14:30 - 15:00	PVT water-to-water heat pumps, design, installation operation	HELIO PAC
15:00 - 15:30	Building management system applied to the energy storage system	SIEMENS
15:30 - 15:50	Coffee break	
15:50 - 16:20	System simulation of the energy storage system	AEE
16:20 - 17:10	Market assessment on hybrid storage systems	RINA
17:10 - 17:30	Q&A	

### VENUE

ADENE  
Address: Av. 5 de Outubro,  
208 2º Piso, Lisboa, Portugal

### LANGUAGE

English / Portugues



www.scores-project.eu

Figure 2: SCORES Training Course programme.





The screenshot shows the Academia ADENE website interface. At the top left is the logo for Academia ADENE, which includes the text 'Academia ADENE' and 'Agência para a Energia'. To the right of the logo is a red button labeled 'AUTENTICAÇÃO' with a link 'Registe-se aqui' below it. Below the header is a green navigation bar with the word 'CURSOS'. Underneath is a grey bar with the text 'CURSOS DISPONÍVEIS'. Below this is a search and filter area with 'Ordenar:' followed by a dropdown menu showing 'Por área' and 'Por data', and a search box labeled 'Título'. The main content area features a green square icon followed by the heading 'EFICIÊNCIA ENERGÉTICA NOS EDIFÍCIOS'. Below this heading is the text 'TRAINING COURSE ON THERMAL ENERGY STORAGE FOR HEATING, COOLING AND DHW FOR BUILDINGS'. Further down, there are two course listings: 'Curso de Auditorias Energéticas em Edifícios Residenciais' with a link 'Voltar ao site da Academia ADENE' below it, and 'Curso de Gestão de Energia em Edifícios de Serviços (CGFES)'.

Figure 3: Dissemination of the course on the ADENE webpage







The screenshot displays a Moodle course interface. At the top, the course title is "TRAINING COURSE ON THERMAL ENERGY STORAGE FOR HEATING, COOLING AND DHW FOR BUILDINGS". Below the title, there is a list of course sections. Each section is represented by a card with a circular icon, the section name, and a dropdown arrow. The sections listed are:

- Training course
- SCORES\_TrainingCourse Project-Introduction - Giling
- SCORES\_TrainingCourse\_TNO input - Storage Technologies
- SCORES\_TrainingCourse\_EHP
- AHPP-Training
- SCORES\_TrainingCourse\_BEMS
- SCORES\_TrainingCourse\_HELIOPAC
- SystemSimulations\_KOD\_nocommentary

Figure 4: Course on the ADENE Moodle platform



### Training course

Thermal energy storage for heating, cooling and DHW for buildings

Download the presentations and agenda.

The SCORES Training Course was organized on the 1st of April 2022, between 9.30 - 17.30 (WET). The main objective of the course was to train professionals in the area through presentations, technical explanations and discussions of each technological solution developed, made by each partner responsible for the development of the respective technology. The SCORES Training Course took place at ADENE's (National Energy Agency) facilities in Lisbon, Portugal. ADENE collaborated with IPS in the organization of the course, made its facilities available to carry out the course and disseminated the course on its webpage and on its social networks.

ADENE is the national energy agency responsible for the Building Energy Certification System based on the transposition of the EPBD directive into Portuguese legislation. ADENE develops activities of public interest in the area of energy and its interfaces with other sectoral policies, in articulation with other entities with responsibilities in this field, including energy efficiency in mobility and water efficiency. ADENE has an academy that organizes training courses for professionals in their respective fields to increase their competencies and qualifications in the areas of energy certification of buildings, energy efficiency, renewable energies, water efficiency, efficient mobility and international certification. It is considered that this collaboration was very important to promote the course among professionals in the field and to give visibility to the course and the SCORES project and their respective solutions.

The course had the participation of 13 trainees, most of them professionals in the area, with a few master's students. The trainers who physically participated in the classroom were Erwin Gilling from TNO (the project coordinator), Luis Coelho from IPS (responsible for organizing the course) and João Garcia from IPS. The rest of the trainers made their presentations and discussion online. Course presentations are available so that the course can be replicated in other countries if requested.



Figure 5: Dissemination of the course on the SCORES webpage "Training"

The course had the participation of 13 trainees, most of them professionals in the area, with a few master's students.

The trainers who physically participated in the classroom were Erwin Gilling from TNO, the project coordinator, and Luis Coelho, from IPS, responsible for organizing the course. and from IPS, João Garcia was also present. The rest of the trainers made their presentations and discussion online.

### 5.3 Training videos

To increase the dissemination of the project and its exploitation, 8 training videos were made in line with the main key exploitation results of the project. One video with a general technical explanation of the integrated solutions and seven videos, one for each SCORES exploitable result was produced.

The list of videos made is as follows:

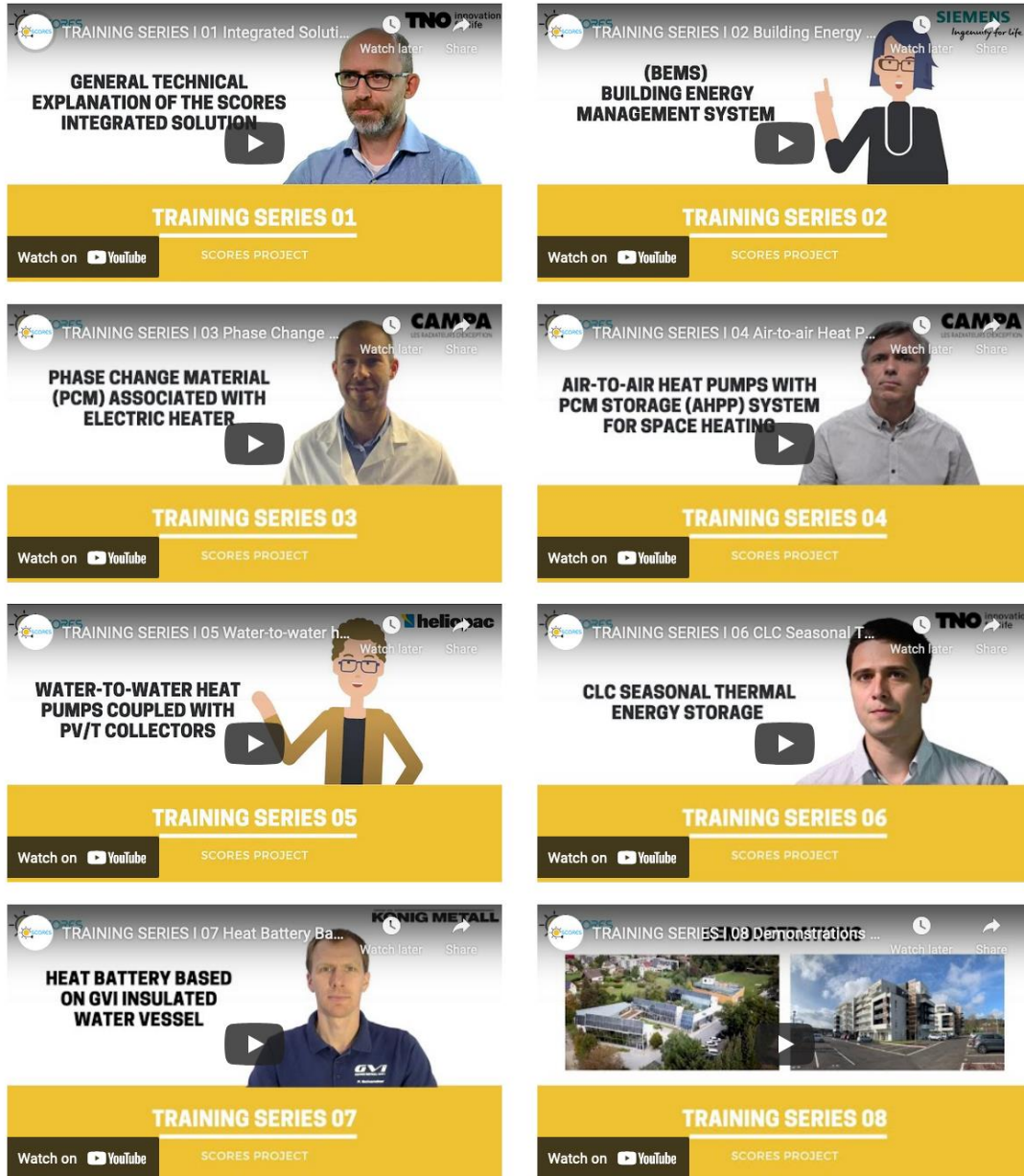
- Video 1: General technical explanation of the SCORES integrated solution (TNO);
- Video 2: Building Energy Management System (BEMS) (SIE);
- Video 3: Phase change material (PCM) associated with electric heater (CAM);
- Video 4: Air-to-air heat pumps with PCM storage (AHPP) system for space heating (CAM/France Energie);
- Video 5: Water-to-water heat pumps coupled with PV/T collectors (HEL);
- Video 7: CLC seasonal thermal energy storage (TNO);
- Video 7: Heat battery based on GVI Insulated water vessel (TNO);
- Video 8: Demonstrations (AEE);


The videos were prepared and produced by IPS and FEN with the collaboration of the partners who developed the residual solutions presented in each video.


The videos are permanently available on the SCORES project website, and the "Training" section on the SCORES webpage (Figure 6), allowing professionals in the area to view the

videos at any time to learn about the solutions developed in the project (<http://www.scores-project.eu/training>).


### Training videos




**TRAINING SERIES 01**  
Watch on  YouTube SCORES PROJECT


**TRAINING SERIES 02**  
Watch on  YouTube SCORES PROJECT

**TRAINING SERIES 03**  
Watch on  YouTube SCORES PROJECT

**TRAINING SERIES 04**  
Watch on  YouTube SCORES PROJECT

**TRAINING SERIES 05**  
Watch on  YouTube SCORES PROJECT

**TRAINING SERIES 06**  
Watch on  YouTube SCORES PROJECT

**TRAINING SERIES 07**  
Watch on  YouTube SCORES PROJECT


**TRAINING SERIES 08**  
Watch on  YouTube SCORES PROJECT

Figure 6: Training videos at the SCORES webpage “Training”



## 5.4 Training Demo Sites Seminar

Training Demo Sites Seminar was organized online due to the limitations of the pandemic which made it physically difficult to carry out, on each of the demo sites as planned in the DoA. For this reason, it was decided to organize the seminar online and, in this case, as there are several points in common between the two demo sites, it was considered more effective to organize a seminar presenting both demo sites, than two independent seminars.

The Training Demo Sites Seminar The seminar was held on April 20, online and lasted 2 hours, between 10:00 a 12:00 (CET). The program of the seminar is shown in Figure 7.

The project coordinator (TNO) introduced the project, those responsible for each demo site (EDF and AEE) presented each of the demo sites and those responsible for each installed technology presented the respective solution (TNO, HEL, CAM, France Energie and SIE).

The number of participants in the seminar was 17 (10 presenters from the seminar organization and 10 trainees). The video of the Training Demo Sites Seminar is available online on the webpage “Training” of the SCORES project website, with the objective to reach more people.

### Demo Sites Seminar

20th of April 2022, 10:00 - 12:00 CET

[Download the flyer and agenda.](#)

[Join the Seminar here!](#)

### SCORES DEMO SITES SEMINAR

Wednesday, 20th of April, 2022  
10:00 - 12:00 CET, Online (TEAMS)

**SEMINAR**

This workshop will be dedicated to the presentation of the demonstration cases of the technologies developed in the SCORES project, to show the feasibility of the separate technology developments and their impact on real case integrated systems. The workshop is dedicated to the scientific community and professionals (production, design, maintenance and installation) related to the areas of energy-efficient buildings and their energy systems.

SCORES includes demonstration sites with residential buildings in two European climate zones (Northern, demo site A and Southern Europe, demo site B). Moreover, the situation with and without grid connection is demonstrated. This will demonstrate the integration, optimization and operation of the hybrid system.

The selected building for the demo site A is located in the city of Gleisdorf in southeast Austria. The building complex consists of an office building and 2 terraced houses, where one house is used as an office as well. In the other two houses, two families are living. The houses are connected to a low-temperature microgrid with a flow/return temperature of 45/35 °C.

The building selected for demo site B is a multi-family residence for seniors. It is located in the Eco-district "Le Parc du Canal" in Agen (France). It is a part of the ZAC Dannelort, an urbanistic area created in 2012 by the city of Agen.

**SCORES PROJECT**

SCORES combines and optimises the multi-energy generation, storage and consumption of local renewable energy (electricity and heat) and grid supply. Via the development of compact hybrid storage technologies, integrated through a smart Building Energy Management System, the project will optimize the self-consumption in residential buildings, bring new sources of flexibility to the grid, and enable reliable operation with positive business cases in Europe's building stock.

**JOIN HERE**

TEAMS MEETING

### SCORES DEMO SITES SEMINAR

Wednesday, 20th of April, 2022  
10:00 - 12:00 CET, Online (TEAMS)

**JOIN HERE**

**AGENDA**

TIME	TOPIC	SPEAKERS
10:00 - 10:10	Introduction of the SCORES project	TNO
10:10 - 10:20	Presentation of the Video 8: Demonstrations	EDF, AEE
10:20 - 10:35	Presentation of the of the Demo Site A and Demo Site B	EDF, AEE
10:35 - 10:50	Presentation of DHW production system based on water to water heat pump coupled with PV/T or PV collectors in the Demo Sites	HELIO PAC
10:50 - 11:05	Space heating subsystem using thermal energy storage in the Demo Sites	CAMPA, France Energies
11:05 - 11:20	Building energy management system in the Demo Sites, Siemens	SIEMENS
11:20 - 11:35	Highly efficient insulations based on GVI Technology applied to thermal energy storage	TNO
11:35 - 12:00	Q&A Session	

**PARTNERS**

www.scores-project.eu

www.scores-project.eu

Figure 7: Demo Sites Webinar at the webpage “Training”





## 5.5 “Hybrid domestic energy systems of the future” Webinar

The final event of the Scores project was on the 17<sup>th</sup> of February 2022. A presentation on the topic of Training was prepared and shared by Luis Coelho from IPS (Figure 8). The webinar was recorded and is available on the Scores website or Scores YouTube channel.

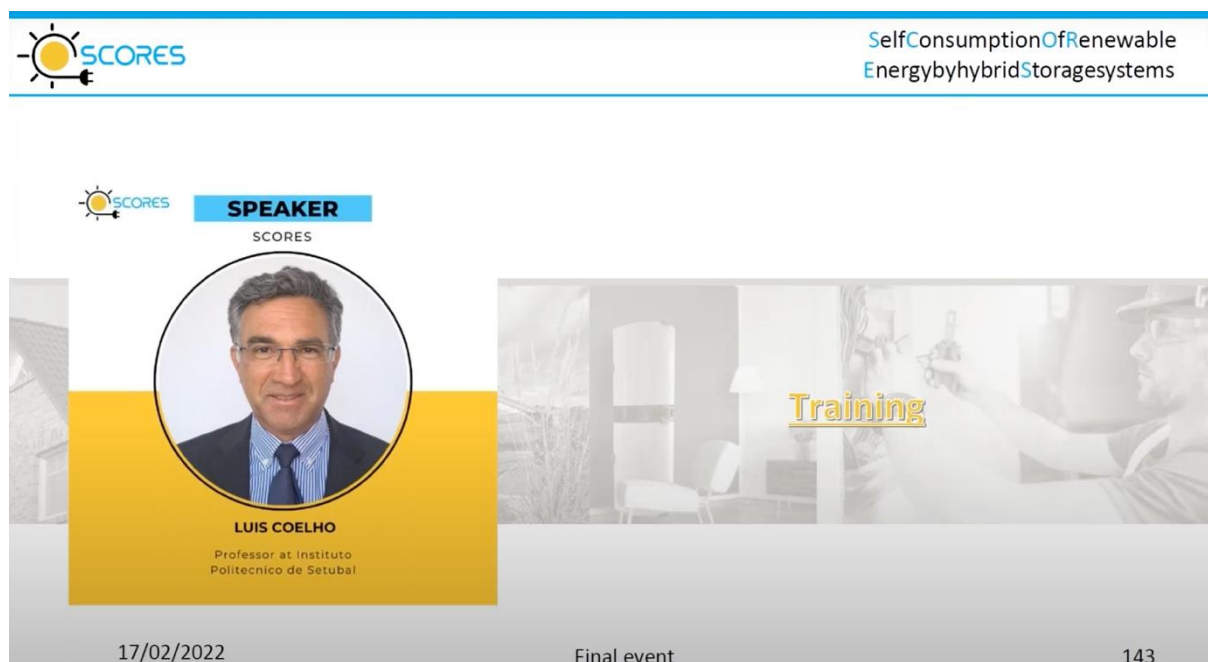


Figure 8: Training presentation during the “Hybrid domestic energy systems of the future” Webinar

## 5.6 Webpage “Training”

On the SCORES project website, a section was created exclusively dedicated to training activities (“Training” webpage), where all training activities, videos, documents and other information were compiled, in order to make all these activities more accessible and visible to reach the largest possible number of professionals in the area (Figure 9).



Figure 9: Webpage “Training”





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## 6 Conclusions

The training activities were strongly conditioned by the pandemic. To mitigate this problem the training activities were based on online events and on videos.

The training activities developed in the project were the following: Webinar “Innovative renewable solutions for residential buildings”; SCORES Training Course; 8 Training Videos; Training Demo Sites Seminar; Webpage “Training Activities”, “Hybrid Domestic energy systems of the future” final event/webinar – presentation of the training activities.

For the training activities to reach a greater number of interested parties, a webpage dedicated exclusively to the training activities was developed on the SCORES project website, where information about all the training activities developed and where you can find specific training videos, as well as video presentations and other documents from the seminars and webinars and the training course.

It is concluded that the appropriate training activities were developed, covering all the technologies developed in the project and aimed at professionals in the area.

As a large part of the training activities is available on the "Training" webpage, these activities are not restricted to the project execution period but extend beyond the end of the project.

