



D2.1

ECF4CLIM PROJECT MANAGEMENT PLAN







| | | | |
|----------------------------|--|---------------------|-----------|
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| Project Coordinator | CIEMAT, Centro de Investigaciones Energeticas, Medioambientales y Tecnologicas | | |
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| Responsible partner | CIEMAT | | |
| Contributing organizations | IST, USE, JYU, UAB, MedaResearch, ISQ, TREBAG, Smarwatt, QUE | | |
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WHO WE ARE

The ECF consortium consists of ten partners. The project is coordinated by Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas-CIEMAT.

| Name | Country | Logo |
|---|---------|---|
| Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas – CIEMAT | ES |  |
| Instituto Superior Técnico. University of Lisbon. IST | PT |  |
| Universidad de Sevilla USE | ES |  |
| University of Jyväskylä JYU | FI |  |
| Universitat Autònoma de Barcelona UAB | ES |  |
| Meda Research Ltd MedaResearch | RO |  |
| Instituto de Soldadura e Qualidade ISQ | PT |  |
| Trebag Szellemi Tulajdon Es Projektmenedzser Korlatolt Felelossegu Tarsasag TREBAG | HU |  |
| Smartwatt Energy Sercuces SA Smartwatt | PT |  |
| Que Technologies Kefalaiouschiki Etaireia QUE | GR |  |

ABOUT THE PROJECT

Through a multidisciplinary, transdisciplinary and participatory process, ECF4CLIM develops, tests and validates a European Competence Framework (ECF) for transformational change, which will empower the educational community to take action against climate change and towards sustainable development.

Applying a novel hybrid participatory approach, rooted in participatory action research and citizen science, ECF4CLIM co-designs the ECF in selected schools and universities, by: 1) elaborating an initial ECF, supported by crowdsourcing of ideas and analysis of existing ECFs; 2) establishing the baseline of individual and collective competences, as well as environmental performance indicators; 3) implementing practical, replicable and context adapted technical, behavioural, and organisational interventions that foster the acquisition of competences; 4) evaluating the ability of the interventions to strengthen sustainability competences and environmental performance; and 5) validating the ECF.

The proposed ECF is unique in that it encompasses the interacting STEM-related, digital and social competences, and systematically explores individual, organisational and institutional factors that enable or constrain the desired change. The novel hybrid participatory approach provides the broad educational community with: an ECF adaptable to a range of settings; new ways of collaboration between public, private and third-sector bodies; and innovative organisational models of engagement and action for sustainability (Sustainability Competence Teams and Committees).

To encourage learning-by-doing, several novel tools will be co-designed with and made available to citizens, including a digital platform for crowdsourcing, IoT solutions for real-time monitoring of selected parameters, and a digital learning space. Participation of various SMEs in the consortium maximises the broad adoption and applicability of the ECF for the required transformational change towards sustainability.

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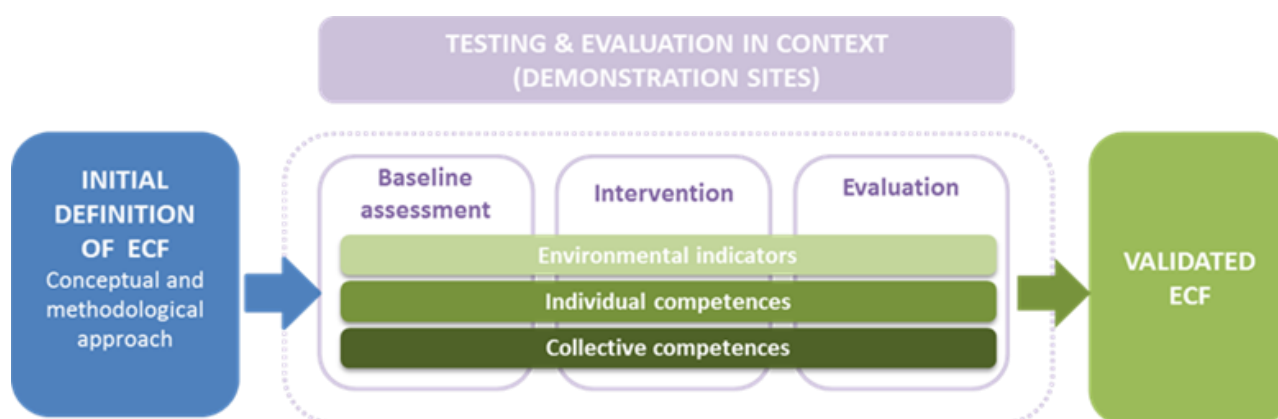
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1 INTRODUCTION

The purpose of this document is to provide a detailed description of the ECF4CLIM project work plan through a Gantt Chart and a work breakdown structure. Furthermore, for internal purposes, this document includes a more detailed description of the project, including, for each task, its objective, expected outcomes, detailed work plan, partners' involvement and roles, deliverables and stakeholder consultation requirements.

To describe the motivations, objectives and structure of the project, figure 1 synthesises the “storyline” and the project work structure by WPs.



In a nutshell, the project aims at co-designing and testing a European Competence Framework for climate change and sustainable development that is transdisciplinary and will enable and empower the citizens to act towards the necessary transition towards sustainability.

Towards that ultimate goal, and with a participatory ethos, we engage students, teachers, parents and the wider educational community in a process contributing to climate action and fostering transformational change towards sustainable development in the spirit of ‘citizen science’. We will do so by providing and co-designing with the educational community the tools (the competence framework, applications, platforms, etc.) that enable these various actor groups to change their personal and collective behaviours, habits, routines, and social norms in order to foster sustainable development, in particular with a view to combating climate change.

A hybrid conceptual and methodological participatory approach combining elements from a variety of disciplines will be established and applied throughout the project to foster participatory experiential learning, involving thinking in-action, doing and reflecting. This hybrid approach will ensure that, for each group/collective within the educational community, the most suitable participatory strategies and tools are implemented. Our hybrid participatory approach includes and combines elements from participatory action research, practitioner research, citizen science (Vohland et al., 2021), citizen engagement (Renn et al., 1995; Horlick-Jones, 2007, Rowe and Frewer,

2005, Rask et al. 2018), deliberative will formation (Englund 2006; 2016), crowdsourcing (Aitamurto & Chen, 2017; De Vreede et al, 2016; Säily et al. 2020), and theory-based stakeholder evaluation (Rogers 2007; Hansen and Vedung 2010).

The scope of the activities will cover the levels of the educational system from primary schools to universities. The long term will be given particular attention, as a central feature of sustainable development, and in view of the often-long time that it takes for policy and educational measures to produce their impacts.

The project will address the four priority areas of action identified by the UNESCO Expert Group on Competences in Education for Sustainable Development (UNESCO 2012), namely professional development in education, governing and managing of institutions, curriculum development, and monitoring and assessment. We will work along four lines of action towards specific objectives aimed at strengthening knowledge, skills, attitudes, practices, and social norms in the areas of the climate change and sustainable development:

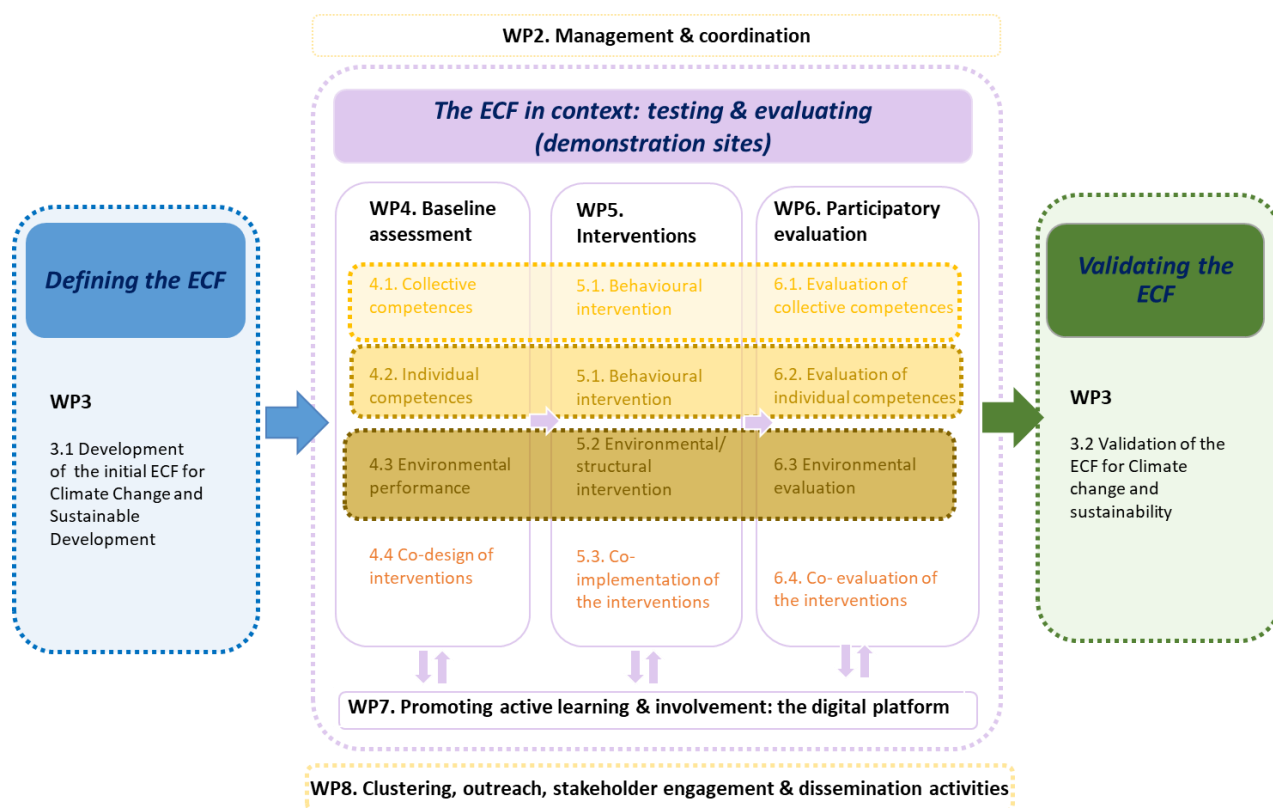
1. **Identifying the challenges and opportunities** for strengthening the educational community's competences by co-designing with the schools and universities and the wider educational community a European Competence Framework (ECF) for climate change and sustainable development.
2. **Testing the ECF** at a number of demonstration sites, by implementing jointly with the educational community a variety of contextually adapted interventions designed to enhance environmental, individual, and collective competences in the area of climate change and sustainable development.
3. **Engaging** the broader educational community in the evaluation of the ECF, addressing the individual, organisational and institutional factors enabling or constraining the desired changes in social practices.
4. **Empowering** the broader educational community to trigger and sustain transformational change towards a more sustainable future through participation in the design, implementation, and evaluation of the ECF.

For ECF testing activities, the project proposes an assessment-intervention-evaluation approach as depicted in figure 3. At each stage of this process, the aspects addressed include environmental indicators of school performance in key areas (energy, water, green procurement, green spaces, transport, indoor air quality, and waste), individual competences (knowledge, skills, attitudes, and practices) and collective competences (organisational arrangements, social norms), as well as individual, organisational and institutional factors that enable or constrain desired change.

The methodology of work of the ECF4CLIM proposal is based on the hybrid participatory approach combining and integrating elements from participatory action research, practitioner research, citizen science, citizen engagement, deliberative will formation, crowdsourcing, and theory-based evaluation. This hybrid approach will guarantee that, for each group within the (wider) educational community, the most suitable participatory strategies and tools are implemented. ECF4CLIM will

also design and implement practical, replicable, and scalable climate change and sustainability interventions co-designed with the educational community. These demonstration activities help the involved actors to gain competences in monitoring progress, assessing environmental impacts, evaluating policy performance, and examining improvement in the ECF competences. The first activity contributes to the conceptualisation of the European Competence Framework and the initial definition of required competences, i.e., knowledge, skills, and attitudes needed in society (WP3). An initial ECF will be defined by drawing on the European Commission's GreenComp, other relevant competence frameworks, and a combination of national and international crowdsourcing/citizen science activity for participatory, reflective, and deliberative will-formation and, secondly, an analysis of relevant scientific literature, other European Competence Frameworks, international, national, and regional policy frameworks, and national curricula. The crowdsourcing in WP3 will use a combination of crowdsourcing tools and face-to face, hybrid or on-line workshops. The tool will be accessible through the ECF4CLIM platform included in WP7. In parallel, the expertise of the project partners, associated partners and advisory board members will be mobilised to identify relevant documentation relating to the global, regional, and national contexts for the document analysis. Through consecutive rounds of content generation, analysis and commenting, an initial European Competence Framework will be defined. This initial ECF framework will be tested at a number of demonstration sites (selected schools and universities) through the baseline - intervention-evaluation sequence described above. This will be done in three work packages: WP4 - Baseline assessment, WP5 - Design and implementation of interventions, and WP6 - Evaluation. Once the initial ECF has been tested and refined in WPs 4, 5 and 6, a final validated ECF will be proposed in WP3, through a deliberative process involving project partners as well as external experts.

D2.1. Project Management Plan



2 WORK STRUCTURE AND WORK PLAN

As depicted in figure 2, all WPs are closely related, and the outcomes of any given WP influence and must be considered by the other WPs. The work is organised around 8 thematic work packages (WP) structured as follows:

WP2 deals with the overall coordination and management of the project internally and with external institutions and collaborators such as the European Commission, the Advisory Board, the Cluster of Funded Projects and the ECF developers.

WP3 elaborates and validates a European Competence Framework for Climate Change and Sustainable Development.

WP4 assesses the baseline of the individual and collective competences, and of the environmental performance of the pilot schools and universities, and co-designs measures for engaging the school community so as to strengthen knowledge, skills, attitudes, and environmental awareness.

WP5 implements a wide range of practical, replicable, and scalable climate change and sustainability interventions within the educational community. These demonstration activities serve as a tool for monitoring progress and assessing the improvement of ECFC competences. The specific interventions will be co-designed through the collaborative process initiated in WP4 and following the European Competence Framework methodology defined in WP3.

WP6 conducts a participatory and deliberative evaluation focused on the capacity of the interventions to enhance the individual and collective sustainability-related competences, and to improve the performance of the selected educational organisations and institutions in the areas of climate change and sustainability. Evaluation is vital for the identification of obstacles, reasons for success and failure, and for the design of appropriate and context-sensitive solutions.

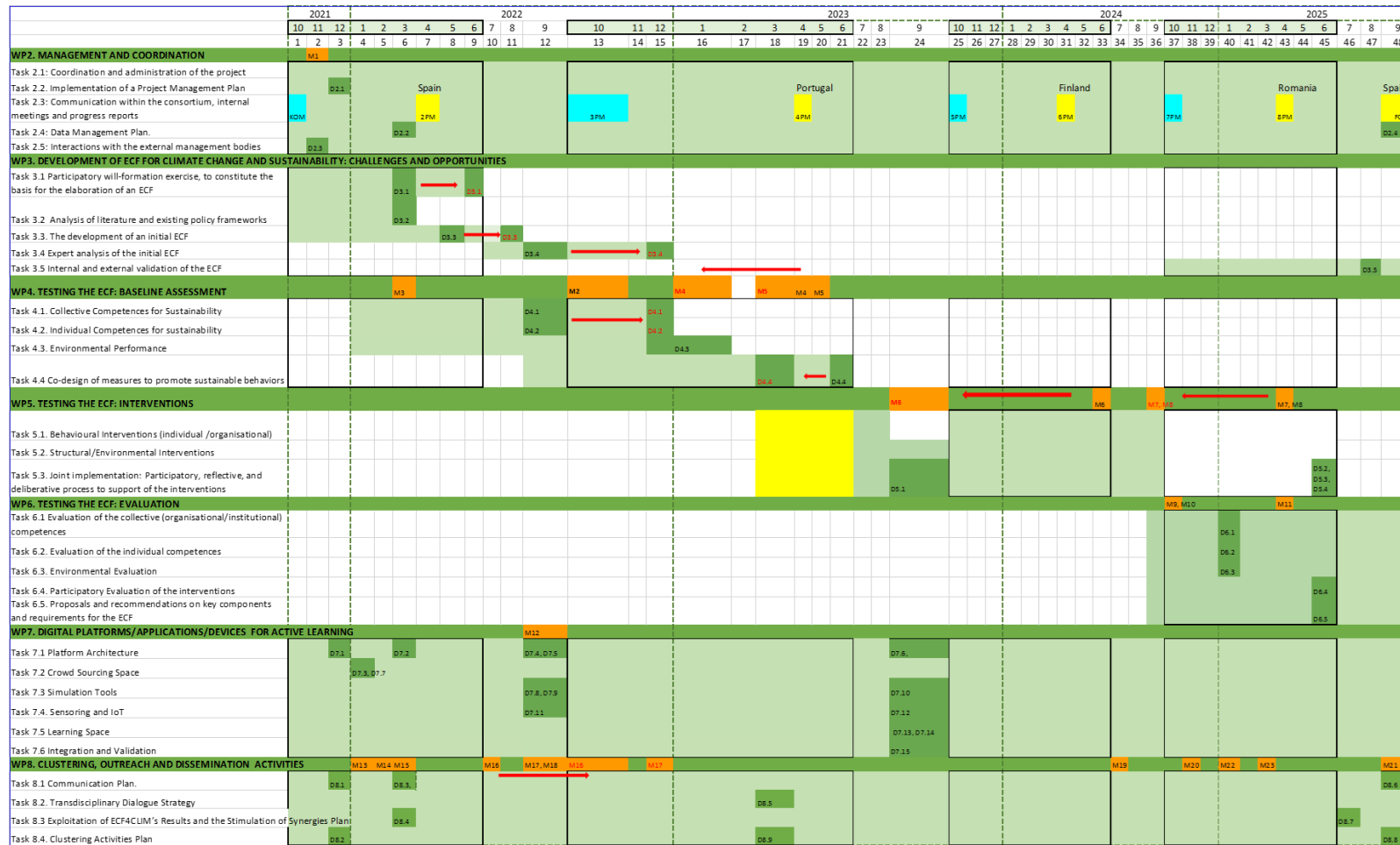
WP7 develops a Digital Platform to Promote Active Learning and Citizen Involvement. It will integrate a crowdsourcing space and simulation tools, manage Internet of Things (IoT) solutions data for real-time monitoring of selected parameters and a learning space, to promote active learning and citizens' involvement.

WP8 elaborates a Communication Plan that promotes the dissemination, visibility and impact of the project; defines a Transdisciplinary Dialogue Strategy that facilitates the exchange of expertise and information between the teams, disciplines, and experts in the project; drafts a Plan for Exploitation of ECF4CLIM's Results and the Stimulation of Synergies (PERSS) with stakeholders, relevant projects, initiatives, and networks; and outlines a Clustering Activities Plan with other selected projects under this Call.



H2020-LC-GD-2020-3, Project 101036505, ECF4CLIM, European Competence Framework for a Low Carbon Economy and Sustainability through Education

D2.1. Project Management Plan



3. DETAILED DESCRIPTION OF THE PROJECT

In collaboration with the WP and task leaders who have provided the information for their corresponding tasks, all the project information has been compiled into one document by the project coordinator. The information provided at the task level includes:

1- Revised description of the task objective and expected outcomes

2- Links with other tasks (what/timing)

- (i) Expected inputs from other tasks (what/when/who is responsible for Delivery)
- (ii) Expected outputs for other tasks (what/when/who is responsible for supplying)

3-Detailed work plan (what/who will participate/when/how (*)/responsible partner)

4- Methodologies and data requirements ()

5-Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

6-Deliverables (including brief description, format, timing, contributing and responsible partner, and proposed reviewers (if any))

WP2

2.1.1 Work Package 2: Management and Coordination. WP leader: CIEMAT

General information on the WP

The aim of WP2 is to ensure the overall coordination and management of the project internally and with external institutions and collaborators such as the European Commission, the Advisory Board, the Cluster of Funded Projects and the ECF developers. Specific objectives are:

- Effective coordination of the project; operating the Project Steering Committee; progress monitoring; communication between project partners and with the Project Officer of the European Commission and other external bodies.
- Project Consortium Agreement establishment, monitoring and maintenance;
- Management and mitigation of project risks;
- Implement of quality control measures

Task information:

Task 2.1: Coordination and administration of the project. Task leader: CIEMAT (M1-M48)

1. - Revised description of the task

This task includes the following subtasks which will be performed by the project coordinator:

1. Coordinate activities within the project, including internal cross-checks of work status in all WPs in relation to deliverables and milestones.

Besides the standard coordination and supervision by the project coordinator, in task 2.2 a detailed Project Management Plan will be produced (this document) which provides more detailed information about the project work plan, by each task. The PMP will be completed by the end of 2021.

2. Contact and report to the project officer, to provide up-to-date and transparent information on the project status and to timely incorporate possible requests for changes.

The project consortium, through the coordinator, has already established a good relationship with the project officer (Ms. Gaëlle Le Boulter). The consortium will regularly inform the project officer about relevant problems and achievements, to facilitate timely implementation of the necessary response measures (if needed).

3. Coordination of quality assurance, consisting of self-evaluation of project results and deliverables within the consortium at least at each internal meeting.

At each internal meeting, project results and deliverables prepared will be presented by the relevant partners and will be discussed within the consortium prior to the submission to the European Commission.

4. Coordinate and supervise on legal, contractual, ethical, financial, and administrative issues.

In collaboration with the rest of project partners, the coordinator will coordinate, supervise and report on all relevant legal, contractual, ethical, financial and administrative issues.

5. Management and mitigation of project risks.

Risk mitigation strategies will be implemented by the project coordinator and will be designed to eliminate, reduce, or manage the impact of anticipated risks. These risks and mitigation measures are detailed in table 1.3.5 of the Grant Agreement.

2. – Links with other tasks

This task will be closely linked to all the other tasks in the project. Task 2.1 is dedicated to ensuring that all WPs and tasks work in a coordinated and harmonised manner, and that the interlinkages between the different WPs are taken into consideration. Regular meetings with WP leaders will be held when necessary.

3. - Detailed work plan

This task will be performed by the project coordinators, Dr Ana Prades and Dr Yolanda Lechón, and will run throughout the 48 months of the project duration.

4. - Methodologies and data requirements

No specific methodology.

5. - Detailed partners' involvement /role/responsibilities

| Partner | Tasks | Role | PM |
|---------|-------|-------------|----|
| CIEMAT | 2.1 | Task leader | 10 |

6. - Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

There are no specific deliverables for this task.

Task 2.2: Implementation of a Project Management Plan

1.- Revised description of the task

The Project Management Plan (PMP) (this document) will be established at the beginning of ECF4CLIM project, and it aims at providing a documented plan for the management and control of the organizational, developmental, and supporting processes necessary to the successful implementation of the project. It outlines:

- the goals and objectives of the project, as well as the organizational structure, the responsibilities and roles of project participants;
- a Work Breakdown Structure (WBS) that will include a schedule per task, responsible partner-related subtasks, related deliverables, and dependencies on other tasks;
- the general procedures and management tools including decision making procedures, quality control of project deliverables and identification and mitigation of risks associated with the project.

The initial PMP will be updated annually if necessary following outcomes and recommendations from the Project Steering Committee and the Project Assembly meetings.

2.- Links from and to other tasks (what/timing)

The PMP establishes in detail all the links between the different WPs and tasks of the project. It is a vital tool for ensuring a smooth advancement of the project.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The PMP has been prepared during the first three months of the project. Each WP leader, in cooperation with task leaders, has prepared a draft version of his/her respective WP. The task leader (CIEMAT) has compiled all the contributions and cross-checked the coherence and completeness of the document.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

No specific methodology.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|---------|-------|--|----|
| CIEMAT | 2.2 | Task leader. Drafting of WP2 and WP6 section | 4 |

D2.1. Project Management Plan

| | | | |
|--------------|-----|--------------------------------------|-----|
| IST | 2.2 | Participant. Drafting of WP4 section | 2 |
| USE | 2.2 | Participant. Drafting of WP5 section | 2 |
| JYU | 2.2 | Participant. Drafting of WP3 section | 2 |
| UAB | 2.2 | Participant. Drafting of WP6 section | 0.5 |
| MedaResearch | 2.2 | Participant. Drafting of WP8 section | 2 |
| ISQ | 2.2 | Participant. Drafting of WP7section | 2 |
| TREBAG | 2.2 | Participant. Drafting of WP7section | 0.5 |
| SMARTWATT | 2.2 | Participant. Drafting of WP7section | 0.5 |
| QUE | 2.2 | Participant. Drafting of WP7section | 0.1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

Deliverable D2.1. Project Management Plan (this document).

Responsible partner CIEMAT. Contributing partners: all WP and Task leaders

Delivered in M3 (December 2021). Proposed reviewers: all project partners.

Task 2.3: Communication within the consortium, internal meetings and progress reports

1.- Revised description of the task

CIEMAT will be responsible for facilitating and guaranteeing an efficient coordination of technical activities and overall progress of the project (by ensuring good communication within the consortium, organising project meetings, managing risk and writing progress reports).

In order to enhance project governance, apart from the General Assembly (composed of project partners and associated partners), an additional internal executive structure named “Steering committee” (SC) will be created. The Steering committee will consist of one representative from each partner and will be led by the project coordinator and advised by the Advisory Board. The role of the SC will be to supervise and coordinate the technical work within the work plan, via the respective WP leaders to ensure that the tasks in the work plan are achieved as expected (in terms of both quality and time).

Additionally, governance of the project will be enhanced by having a bidirectional communication flow between the Steering Committee (represented by the coordinator) and the Advisory board as well as the project officer.

A detailed explanation of the governance of the project can be found in deliverable D2.3 Terms of Reference of the Advisory Board.

2.- Links from and to other tasks (what/timing)

CIEMAT, as the leader of this task, will monitor and facilitate the interactions, already identified in the PMP, between the different tasks and WPs.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

There will be eight General Assembly and Steering Committee Meetings throughout the project duration. Four of them will be via teleconference and the other four will be held face-to-face. The first one, the kick-off meeting, was held on October 18th 2021 via teleconference. The next one will be held in Madrid face to face in April 2022.

| Meeting | Format | Place | Date |
|-----------------------------------|----------------|--------|-------------------------------|
| Kick off meeting | Teleconference | | October 18 th 2021 |
| 2 nd GA and SC meeting | Face to face | Madrid | April 2022 |

| | | | |
|-----------------------------------|----------------|----------|----------------|
| 3 rd GA and SC meeting | Teleconference | | October 2022 |
| 4 th GA and SC meeting | Face to face | Portugal | April 2023 |
| 5 th GA and SC meeting | Teleconference | | October 2023 |
| 6 th GA and SC meeting | Face to face | Finland | April 2024 |
| 7 th GA and SC meeting | Teleconference | | October 2024 |
| 8 th GA and SC meeting | Face to face | Romania | April 2025 |
| Final Conference | Face to face | Madrid | September 2025 |

The SC will have bi-monthly meetings (teleconferences).

All partners will participate in the General Assembly meetings, Steering Committee meetings, and related activities, as well as provide the necessary inputs to the writing of progress reports.

The individual WP leaders will report on the activities, progress and, if relevant, problems within the respective work packages. If problems occur, proposals for solving these problems will also be put forward from the concerned work package leader to the SC.

The coordinator will deliver 6-monthly progress reports to the EC. These will be 4-5-page reports focussing on the main achievements.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

No specific methodology.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|---------|-------|-------------|----|
| CIEMAT | 2.3 | Task leader | 6 |

| | | | |
|--------------|-----|------------------------|-----|
| IST | 2.3 | Participant. WP leader | 1 |
| USE | 2.3 | Participant. WP leader | 2 |
| JYU | 2.3 | Participant. WP leader | 2 |
| UAB | 2.3 | Participant | 0.5 |
| MedaResearch | 2.3 | Participant. WP leader | 2 |
| ISQ | 2.3 | Participant. WP leader | 2 |
| TREBAG | 2.3 | Participant | 0.5 |
| SMARTWATT | 2.3 | Participant | 0.5 |
| QUE | 2.3 | Participant | 0.9 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

There are no specific deliverables for this task.

Task 2.4: Data Management Plan

1.- Revised description of the task

A data management plan will be developed to clarify on related management practices concerning data exchange during the course of the project (i.e., general assumptions, external studies, etc.). Its actual form and the details of the data management will be elaborated in months 1-6 of the project period, and updated when necessary and a final version produced at the end of the project in month 48.

Thereby, we will seek to make the results, materials, and the underlying data accessible to other researchers, either via the Open Research Data pilot or alternate publicly accessible websites/databases. Throughout the project, we will strive for as much transparency and openness as possible.

Scholarly articles resulting from ECF4CLIM will be published in both gold and green open access. For most articles, "gold" access in an open access peer-reviewed journal will be adopted as the first option. This will be combined with a free repository ("green" access) of all scientific papers arising from the project on the ECF4CLIM website. The ECF4CLIM website will be alive for 5 years after the end of the project. Publications will be available in the institutional repositories of partners even after the project website is not online anymore.

2.- Links from and to other tasks (what/timing)

The data management plan will concern all the data and results generated in all WPs. Whenever data are gathered and results are obtained in any WP, they will be managed following the provisions set in the DMP.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

An initial version of the Data Management Plan will be produced in month 6. It will be updated when necessary and a final version will be produced in month 48.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

As for Task 2.3, there is not a specific methodology.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|---------|-------|-------------|----|
| CIEMAT | 2.4 | Task leader | 4 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

Two deliverables are associated to this Task.

D2.1 Data Management Plan.

Responsible partner CIEMAT.

Delivered in M6 (March 2021).

Proposed reviewers: all project partners.

D2.4 Final version of the Data Management Plan.

Responsible partner CIEMAT.

Delivered in M48 (September 2025).

Proposed reviewers: all project partners.

Task 2.5: Interactions with the external management bodies

1.- Revised description of the task

An Advisory Board (AB) will interact with the project team in order to bring their expertise, advice and recommendations to the project actions (ongoing and forthcoming) and decisions. The Advisory Board is composed by scientific, educational and pedagogical experts, NGOs, authorities and institutions playing an important role in the development of competence frameworks, sustainability and climate change, citizen science, implementation of low carbon measures in educational centres, etc...

Two types of advisory board are envisaged. One local advisory board composed of all interested entities in each country, and one international advisory board composed of 2-3 representative entities in each country.

This task will:

1. select and invite potential members to each external body
2. prepare meetings and workshops between project partners and external bodies;
3. inform periodically the members of the external bodies about project progress;
 - consult, take note and implement recommendations and advice from the external bodies.

2.- Links from and to other tasks (what/timing)

Recommendations from the AB might propose changes that affect several WPs. The coordinators and the Steering Committee will decide to what extent these changes can be made.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

CIEMAT as task leader will be responsible for the interactions with the AB.

The international AB will be invited to participate in the General Assembly meetings held twice a year, one via teleconference and the other face to face.

The national ABs will be convened annually to inform them the project developments.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

No specific methodology.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|---------|-------|-------------|----|
| CIEMAT | 2.5 | Task leader | 4 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

D2.3 Terms of Reference of the Advisory Board.

Responsible partner CIEMAT.

Delivered in M2 (November 2021).

Proposed reviewers: JYU, USE, IST, UAB, MedaResearch

WP3

2.1.2 *Work Package 3: DEVELOPMENT OF AN ECF FOR CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT*

General information on the WP

WP3 will develop and validate a European Competence Framework for Climate Change and Sustainable Development. The starting point for the process is the description of the ECF for Sustainability that has been outlined in European Commission's GreenComp, due to be published in January 2022.

WP3 will comprise participatory, reflective, and deliberative will-formation through broad international crowdsourcing exercises (Task 3.1). It will also comprise an analysis of relevant scientific literature as well as international, national, and regional policy frameworks, and national curricula (Task 3.2). WP3 takes note of other existing European Competence Frameworks, to the extent that they are relevant to the goals of the ECF4CLIM project. These include the European Digital Competence Framework; the European Competence Framework for Lifelong learning; Public Procurement, and the Entrepreneurship Competence Framework; as well as other work on sustainability competences by international organisations such as UNECE.

Based on these various inputs, an initial ECF for climate change and sustainable development will be elaborated (Task 3.3); analysed by external experts (Tasks 3.4); and validated through internal and external validation mechanisms (Task 3.5).

Task information:

Task 3.1: Participatory will-formation utilising a broad international crowd-sourcing exercise as a method to constitute the basis for the elaboration of an ECF

1.- Revised description of the task

Task 3.1 will comprise a crowdsourcing exercise, which will solicit civic opinion on operationalising the individual and collective competences in climate change and sustainable development, as well as on the factors enabling and constraining their adoption and transmission in education. The aim is to engender a collective meaning-making process, by engaging a large, international group of students, parents, teachers, and experts in education to collaboratively apply and make alive the competences defined in European Commission's GreenComp and other relevant competence frameworks. The crowdsourcing exercise will make use of different tools and opportunities to enable wide participation tailored to the needs and participation means of different communities. Particular effort will be made to solicit the opinion and experiences of underrepresented communities such as people from disadvantaged socioeconomic backgrounds, regions with lower GDP per capita, and minority ethnic and indigenous communities (e.g. the Sami in Finland and the Roma in Romania) who often suffer disproportionately from climate change and environmental risks.

2.- Links from and to other tasks (what/timing)

Task 3.2 led by ISQ will run in parallel with Task 3.1, and jointly these tasks will form a basis for the development of the first draft of the operationalised European competence framework for climate change and sustainability (Task 3.3).

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The crowdsourcing exercise will utilise different data collection opportunities and tools to enable different types of communities to have their voice heard in the process. These include the following two types of activities:

1. National online or face-to-face workshops to collect ideas on sustainability competences.

Partners, in collaboration with demonstration sites, will map and make use of various existing networks to co-design and co-organise online or face-to-face workshops in their countries, including but not limited to the demonstration sites, to host creative discussions in groups representing different viewpoints, such as teachers and young people on the demonstration sites, as well as various networks of experts in sustainability and environmental education.

The tool that JYU will use in these workshops is the Flinga platform <https://edu.flinga.fi/tools>, which has the advantage of being flexible, free and easy to use in different settings such as in schools. Partners can collect information with electronic tools like Flinga (requires a good internet connection), but may alternatively also use post-it notes and write the results on a Word file, which can then be shared by JYU. JYU will provide detailed instructions for partners about the structure and inputs for the workshop.

2. International online discussion to analyse and prioritise elements of sustainability competences.

In order to operationalise and deepen the understanding of sustainability competences that have been developed by other actors, such as the European Commission's GreenComp, or that have arisen from the two crowdsourcing exercises described below, members of the international community of experts in sustainability and environmental education, as well as other interested groups, will be engaged in the process.

The eDelphi-platform <https://www.edelphi.org/#> will be utilised for enabling discussions, for defining problems and deepening the understanding of essential issues and challenges of educating sustainability competences in different contexts. The same eDelphi inputs can be used both in face-to-face and online settings, with the inputs staying the same and the discussion enriching it from one event to the next. The eDelphi discussions will take the form of two rounds of discussions, with those from the first round serving as inputs for the second round.

The eDelphi will be hosted by the JYU team. The tool will be accessible first through a weblink distributed through email or a QR code at events, and will be integrated into the ECF4CLIM platform as soon as the platform has been set up (Task 7.1). The individual participants may participate in discussions on eDelphi either in English or in their national languages. Online translation tools integrated into browsers can be utilised to translate former contributions to enable multilingual conversation. JYU team will finally translate all inputs into English for data analysis. These platforms and ongoing discussions can be advertised through networks and social media.

In order to ensure a genuinely bottom-up process in which the voice of different stakeholders is heard, the various communities must be able to participate in the crowdsourcing exercises in their own language. For this purpose, the instructions and

inputs will be made available by JYU in the following languages of the partner countries: Spanish, Portuguese, Romanian, Finnish, and English. At the same time, the process will enable the ECF4CLIM to spread knowledge about the importance of fostering sustainability competencies in educational community and disadvantaged groups.

| What? | How? | Who? | When? |
|---|---|---|---------------------------------|
| Preparation and development of crowdsourcing exercises, including the consideration of ethical aspects in partner countries | Preparing crowdsourcing guidelines and inputs (Translations) | JYU Comments by partners and teachers and Staff at demonstration sites in Finland, Spain, Portugal and Romania | Before January 31 st |
| Mapping networks of collaboration in crowdsourcing | Contact possible networks to map potential collaboration in organising online workshops to different stakeholders' networks | Partners: JYU, IST, USE, MEDARESEARCH, UAB, CIEMAT and contact persons of demonstration sites (Finland, Spain, Portugal, and Romania) | Before January 31 st |
| Training session for partners | | JYU organising, partners attending (Finland, Spain, Portugal, and Romania) | February 2 nd 9.00 |
| National crowdsourcing exercises though online and face-to-face workshops | Organising and facilitation of online discussion sessions. Separate sessions for teachers, principals, students, and other stakeholders; and one dialogical session for different stakeholders together. Includes also short presentation of eDelphi to introduce the eDelphi discussion and motivate people to participate in it. | Materials and outline of the structure: JYU Organizing: all the partners and demonstration sites (Finland, Spain, Portugal and Romania) JYU, CIEMAT, IST, USE, UAB, MEDARESEARCH, ISQ, (TREBAG, QUE) | February-mid-May |

| | | | |
|--|---|---|--|
| Summarise the content and themes of national crowdsourcing exercises | Writing and sending descriptions of conducted crowdsourcing practices and summaries of the contents and evolved themes of discussions in English | All the partners (JYU, CIEMAT, IST, USE, UAB, MEDARESEARCH, ISQ) | Sent to JYU before the mid-May |
| International crowdsourcing exercise using eDelphi platform to elaborate the operationalised competences | Preparing visual step-by-step instructions for participants for using eDelphi; and 'advertising blurbs' for partners to use in soliciting participants. | JYU | January 2022 |
| | Sending invitations (anonymous link) to eDelphi to various stakeholders | Partners JYU, CIEMAT, IST, USE, UAB, MEDARESEARCH, ISQ, TREBAG, QUE | February-March 2022 |
| | Sending email list of desirable attendees in each country to JYU | Partners: CIEMAT, IST, USE, JYU, UAB, MEDARESEARCH, ISQ, TREBAG, QUE and demonstration sites' contact persons | Preliminary lists January, additions till April 2022 |
| | Sending invitations to the selected attendees | JYU | February-April 2022 |
| | eDelphi crowdsourcing | JYU | February-Mid-May 2022 |
| | Translation and analysis of eDelphi data | JYU | End of May 2022 |

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

Crowdsourcing is conducted with the help of online platforms Flinga and eDelphi. Below, the JYU plan for organising the two types of crowdsourcing activities is outlined. The partners will be able to adapt these to their own operational context. Activities can

be promoted through partners' networks and social media. The specifics will be negotiated with each partner in a separate training seminar on February 2nd, 2022.

National online or face-to-face workshops to collect ideas on sustainability competences/ Flinga (Finnish examples)

1. A BROAD-BASED HYBRID SEMINAR WITH KEY STAKEHOLDERS IN MARCH 2022
Co-organisers: Interdisciplinary Network of Environmental and Sustainability Education Research (SIRENE), OPH (National Board of Education) and The Finnish Association of Nature and Environment Schools (LYKE-network).

Various stakeholders are invited to participate through SIRENE and LYKE networks and the National Board of Education. Also the network of sustainability education project and various environmental educator networks are used, including LYKE-network Experts, Teacher networks (Ilmasto-opet), teacher associations (BMOL, OAJ) The invitations will be disseminated through Facebook-groups and email lists.

2. TARGETED WORKSHOPS WITH ACTIVE TEACHERS AND PRINCIPALS
Co-developing and testing the focus and the feeds for the forthcoming crowdsourcing activities
3. TARGETED WORKSHOP WITH SAAMI DELEGATION (Finnish Indigenous group)
4. TARGETED WORKSHOPS IN DEMONSTRATION SITES (students, teachers and administration of the University of Jyväskylä, one higher secondary school (Sammon keskuslukio), one yet unnamed comprehensive school
5. WORLD ENVIRONMENTAL EDUCATION CONGRESS (WEEC 2022) 14.-18.3.2022
Workshop for international experts and researchers

International online discussion to analyse and prioritise elements of sustainability competences/eDelphi

Invitation to a large audience of experts and interested people in the project countries (like with the SIRENE-seminar above in Finland); sending the link to the eDelphi platform to the various stakeholders through suitable media in each country.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.

The task 3.1 will be led by JYU, but the involvement of the research partners in countries with demonstration sites (Spain, Portugal, and Romania) is paramount for the success of the task. The partners in these countries will be asked to identify the relevant stakeholders and potential networks to collaborate and conduct crowdsourcing together within their own countries. They may choose to host workshops online or in face-to-face events, or in demonstration sites, to collect opinions utilising the Flinga platform. Additionally, they will be asked to forward information about the possibility to join discussions on eDelphi to relevant stakeholders.

Specifically, the partners will be asked to complete the following steps in December or early January

- Mapping networks and with whom they could collaborate and to whom they could send requests to take part in crowdsourcing
- Mapping out the possibilities of having workshops
- Deciding who will be the moderators of the discussions, and identifying the resources available in each country for moderating the discussion

From February to May 2022, JYU and the other partners will facilitate the crowdsourcing exercises nationally/internationally through the means described above.

In mid-May 2022, the partners will be asked to provide back to JYU the results from the national crowdsourcing exercises. For the purposes of the deliverable 3.1., the partners are also asked to briefly describe the steps they took (communities they reached out to, workshops they organised, etc.) in collecting the data.

The SME partners in Portugal, Hungary, and Greece will only be asked to forward information about the possibility to join discussions on eDelphi to relevant stakeholders.

JYU will facilitate the partners' work by completing the following steps in December 2021 and January 2022:

- Provide detailed instructions for partners
- Provide instructions and inputs used in national Platforms in the native languages (Spanish, Portuguese, Romanian, Finnish) and English
- Provide a Doodle form for partners to identify a suitable time for organising a meeting and demo workshop for the moderators of the national discussions/workshops, to take place in January.

JYU will also set up the eDelphi in January 2022 and facilitate it through to May 2022. The eDelphi process will continue with more limited engagement on the ECF4CLIM platform until the end of the project.

The costs for the translations as well as the eDelphi platform are in the JYU budget. The Flinga platform is free to use, and will not incur costs.

| Partner | Task | Role | PM |
|--------------|------|--|-----|
| JYU | 3.1 | Task leader. Development of the methodology, instructions and required translations of them to national languages of partners. Conducting the crowdsourcing activities in Finland and hosting the international crowdsourcing activities. Analysis of all crowdsourcing data and preparation of the deliverable 3.1 | 10 |
| IST | 3.1 | Conducting all crowdsourcing activities in Portugal in collaboration with ISQ. Providing JYU with the results. | 0.5 |
| ISQ | 3.1 | Conducting all crowdsourcing activities in Portugal in collaboration with IST. Providing JYU with the results | 0.5 |
| CIEMAT | 3.1 | Conducting all crowdsourcing activities in Spain in collaboration with USE and UAB. Providing JYU with the results. | 0.5 |
| USE | 3.1 | Conducting all crowdsourcing activities in Spain in collaboration with CIEMAT and UAB. Providing JYU with the results. | 0.5 |
| UAB | 3.1 | Conducting all crowdsourcing activities in Spain in collaboration with USE and CIEMAT. Providing JYU with the results. | 1 |
| MedaResearch | 3.1 | Conducting all crowdsourcing activities in Romania. Providing JYU with the results. | 0.5 |
| Trebag | 3.1 | Identifying potential individuals or organisations who might be interested in participating in crowdsourcing and advertising the crowdsourcing on eDelphi to them. | 0.5 |
| Que | 3.1 | Identifying potential individuals or organisations that might be interested in participating in crowdsourcing, and advertising the crowdsourcing on eDelphi to them. | 2 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))



D3.1: Report on the results of the crowdsourcing exercises (Month 9)

Responsible partner: JYU

Contributing partners: CIEMAT, IST, ISQ, USE, UAB, MEDARESEARCH, TREBAG, QUE, Smartwatt

Delivery date: June 2022

Proposed reviewers: UAB

Task 3.2: Analysis of literature and existing policy frameworks

1.- Revised description of the task

The review and analysis of the relevant literature and policy frameworks will be conducted to provide a solid foundation for the elaboration of an ECF.

This comprehensive literature review will provide the opportunity to reflect on the current debate in the academic and non-academic literature on the conceptualisations of sustainability competences, competence development, and education for sustainable development.

2.- Links from and to other tasks (what/timing)

Task 3.2 will:

- Provide feedback to task 3.3 giving a solid foundation for the elaboration of the ECF

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Lead Partner: ISQ. Participants: CIEMAT, IST, USE, JYU, UAB, MEDARESEARCH, TREBAG, QUE

- Deliverable 3.2: Report based on the analysis of the literature, policy documents and national curricula - M6, March 2022

Partners will contribute for the analysis of national curricula in the project countries: Finland, Hungary, Portugal, Romania, Greece, and Spain. They will also contribute to benchmarking, via comparison of national curricula in selected key countries, such as Norway, Netherlands and the UK (M5).

| What? | How? | Who? | When? |
|--|---------------------------------|-----------------------------|-------------------|
| Preparation and development of literature review | Preparing guidelines and inputs | ISQ Comments by partners | Before 15 January |

| | | | |
|--|--|----------|-------------------|
| Collection of relevant: <ul style="list-style-type: none"> scientific literature international, European Union, national, regional, and organisational policy frameworks for sustainability partners national curricula and Norway, Netherlands, and UK | Researching and selecting according to pre-defined criteria | Partners | Before 31 January |
| Analysis and compilation of information | Compile the results obtained in the several stages of the research | ISQ | 10 February |
| Preparation of the deliverable 3.2 | Writing the report | ISQ | 28 February |
| Review of the report | Review and analysis | Partners | 15 March 2022 |
| Finalisation of the deliverable 3.2 | Fine-tuning | ISQ | 31 March 2022 |

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

A detailed report will be elaborated, drawing on the following sources:

- Review of relevant scientific literature regarding sustainability competences, competence development and education for sustainable development.
- Analysis of international, European Union, national, regional, and organisational policy frameworks for sustainability.
- Analysis of national curricula in the project countries: Finland, Hungary, Portugal, Romania, Greece, and Spain. To provide a benchmark for comparison, national curricula in selected key countries, such as Norway, Netherlands, and the UK, will be reviewed.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc)

| Partner | Task | Role | PM |
|--------------|------|--|-----|
| ISQ | 3.2 | Task leader. Development of the methodology. Instructions to partners. Analysis of data and preparation of the deliverable 3.2 | 7,5 |
| IST | 3.2 | If necessary, assisting ISQ in collecting relevant national documents. | 0,5 |
| JYU | 3.2 | Collecting relevant national documents and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 2 |
| CIEMAT | 3.2 | Collecting relevant national documents, in collaboration with. USE and UAB and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 0,5 |
| USE | 3.2 | Collecting relevant national documents, in collaboration with CIEMAT and UAB and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 0,5 |
| UAB | 3.2 | Collecting relevant national documents, in collaboration with CIEMAT and USE, and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 0.5 |
| MedaResearch | 3.2 | Collecting relevant national documents, and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 0,5 |
| Trebag | 3.2 | Collecting relevant National documents and sending the information to ISQ. If necessary, providing summaries of materials only available in national languages. | 0,5 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

D3.2: Report based on the analysis of the literature, policy documents and national curricula (Month 6).

Responsible partner: ISQ

Contributing partners: CIEMAT, IST, USE, JYU, UAB, MEDARESEARCH, TREBAG, QUE

Delivery date: March 2022

Proposed reviewers: JYU

Task 3.3: The development of an initial EFC

1.- Revised description of the task

Based on the inputs from the participatory will-formation exercise (Task 3.1) and the literature and policy framework analysis (Task 3.2), a draft ECF will be elaborated. The initial ECF will take the form of a working document comprising the definition of the knowledge, skills, and attitudes in terms of competencies for climate change and sustainable development. The ECF will draw from the European Commission's GreenComp, as well as other relevant competence frameworks, and will work towards an operationalised framework that offers practical guidance to educational institutions and the educational community at large. Additionally, the collective competences and institutional framework conditions will be elaborated with an eye to offering educational institutions tools for addressing any internal or external obstacles they may face in building sustainability competences.

2.- Links from and to other tasks (what/timing)

The analysis of other relevant elaborations of sustainability competences and frameworks will start in January 2022 in parallel with tasks 3.1 and 3.2. Once tasks 3.1 and 3.2 are completed, their results can be compared with those of the comparative analysis of the pre-existing frameworks, so as to create an operationalizable draft ECF for the next steps of the ECF4CLIM project.

Close collaboration with WP 4 during the winter and spring 2022 is required to ensure that the questionnaires for measuring individual and collective competences in the baseline assessments address the individual and collective competences that will form the basis of the draft ECF.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task 3.3 is undertaken by JYU, according to the following plan:

- 1) Detailed comparative analysis of the other relevant elaborations of sustainability competences are conducted, in order to identify the similarities and differences between them and to ensure that all relevant elements are taken into account.
- 2) The results from the comparative analysis as well as tasks 3.1 and 3.2 will be analysed and operationalised against the GreenComp.
- 3) The draft ECF will be elaborated.

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The comparative analysis will be conducted using computer-aided qualitative analysis software ATLAS.ti. The data will be produced in tasks 3.1 and 3.2 as well as through internet searches designed to identify the existing relevant sustainability competence frameworks. Close collaboration with the authors of the GreenComp at JRC will also be required.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc)

Task 3.3. is completed by JYU in close collaboration with the task leader of 3.2 (ISQ).

| Partner | Task | Role | PM |
|--------------|------|---|-----|
| JYU | 3.3 | Task leader. Analysis of all data and preparation of the deliverable D3.3 | 10 |
| ISQ | 3.3 | Dialogue with JYU to ensure that the insights from D3.2 are properly integrated in preparing D3.3 | 1 |
| IST | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 0,5 |
| CIEMAT | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 0,5 |
| USE | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 0,5 |
| UAB | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 1 |
| MedaResearch | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 0,5 |
| Trebag | 3.3 | Commenting to ensure all insights are integrated in preparing D3.3 | 0,5 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

D3.3: Draft version of the European Competence Framework for Climate Change and Sustainable Development Report drawing from the results of tasks 3.1 and 3.2, as well as EC's GreenComp and other relevant frameworks. (M11)

Responsible partner: JYU

Contributing partners: CIEMAT, IST, ISQ, USE, UAB, MEDARESEARCH, TREBAG, QUE, Smartwatt

Delivery date: August 2022

Proposed reviewers: CIEMAT and all partners

Task 3.4: Expert analysis of the initial ECF

A commenting round of the preliminary ECF by an expert panel will be organised. The experts will include academics, policymakers, officials, and NGOs - at European, national, regional, and local levels. The expertise and networks of project partners will be drawn upon to identify and engage the experts. The expert analysis will take the form of an online workshop and will be conducted through a videoconferencing application such as Zoom or Microsoft Teams. This task is carried out in parallel with the work carried out in WP4.

2.- Links from and to other tasks (what/timing)

This task will draw directly on Task 3.3, which has elaborated an initial ECF, to be submitted for comments by experts. Indirectly, the task draws on tasks 3.1 and 3.2 (crowdsourcing and literature review), which constitute the basis for the initial ECF. The key output of Task 3.4, the initial ECF revised according to expert comments, feeds directly into Task 3.5 – the internal and external validation of the initial ECF.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The task will be led by UAB, with participation from all partners. The following steps will be undertaken:

1. Collection of a long list from which the experts to be consulted will be selected, drawing on the broad contact networks of the partners.
2. Invitations sent to a balanced and representative set of experts.
3. Organisation of an on-line workshop, via Zoom, Teams, or a similar online platform.
4. Analysis of expert input and comments on the initial ECF.
5. Drafting of a summary report on the basis of the comments (D3.4).
6. Elaboration of a methodology for internal and external validation of the ECF in Task 3.5.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

The contact networks of the partners will constitute the main source for the identification and contacting of experts. An existing on-line platform will be used for the videoconference.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.).

| Partner | Task | Role | PM |
|---------|------|------|----|
|---------|------|------|----|

| | | | |
|--------------|-----|---|-----|
| UAB | 3.4 | Task leader. Development of the methodology. Instructions to partners. Hosting the external analysis of the draft ECF. Analysis of data and preparation of the deliverable 3.4 | 6 |
| JYU | 3.4 | Providing UAB with names of suitable experts. | 2 |
| CIEMAT | 3.4 | Providing UAB with names of suitable experts. | 0.2 |
| USE | 3.4 | Providing UAB with names of suitable experts. | 0.2 |
| IST | 3.4 | Providing UAB with names of suitable experts. | 0.2 |
| ISQ | 3.4 | Providing UAB with names of suitable experts. | 0.5 |
| MedaResearch | 3.4 | Providing UAB with names of suitable experts. | 0.2 |
| Trebag | 3.4 | Providing UAB with names of suitable experts. | 0.2 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

D3.4 Report based on the expert analysis of the initial ECF will be delivered in month 15. The report will be drafted by UAB, with selected contributions from other partners, notably those who have suggested experts for the workshop.

Proposed reviewer of the deliverable: JYU.

Task 3.5: Internal and external validation of the ECF

1.- Revised description of the task

The internal validation of the ECF by the project partners will draw from the inputs from WPs 4, 5, and 6; as well as from a prioritisation process in an online workshop, which will be conducted using a videoconferencing application with participation by all project partners. The external validation will involve the same experts as task 3.4 and will organise a similar online prioritization process as the internal validation process. The inputs from the internal and external processes will feed into the writing of the final ECF.

Given that the starting point for the ECF4CLIM project is participatory action research (PAR), the later stages of the process will evolve, according to participant and stakeholder needs, as the project progresses. Therefore, the task of validating the ECF can be outlined here in a rather sketchy way and will be specified later.

2.- Links from and to other tasks (what/timing)

Task 3.5. will validate the ECF developed in task 3.3; using methodology developed in task 3.4. The results from WP 4, 5, and 6 will feed into task 3.5.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

On-line workshops with partners and experts (internal validation and external validation)

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

The methodology will be elaborated in agreement with the existing practices and recommendations for the European projects.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|---------|------|---|-----|
| JYU | 3.5 | Task leader. Development of the methodology. Hosting the internal validation with partners, and external validation with the same experts as those involved in task 3.4. Preparing deliverable 3.5 | 5 |
| UAB | 3.5 | Participating in internal validation. Assisting JYU with contacting the external experts involved in task 3.4. | 0.5 |

| | | | |
|--------------|-----|---------------------------------------|-----|
| CIEMAT | 3.5 | Participating in internal validation. | 0.3 |
| USE | 3.5 | Participating in internal validation. | 0.3 |
| IST | 3.5 | Participating in internal validation. | 0.3 |
| MedaResearch | 3.5 | Participating in internal validation. | 0.3 |
| Trebag | 3.5 | Participating in internal validation. | 0.3 |
| Que | 3.5 | Participating in internal validation. | 2 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

D3.5: Final validated version of the European Competence Framework for Climate Change and Sustainable Development (M47)

Responsible partner: JYU

Contributing partners: CIEMAT, IST, ISQ, USE, UAB, MEDARESEARCH, TREBAG, QUE, Smartwatt

Delivery date: August 2025

Proposed reviewer: CIEMAT and all partners

WP4

2.1.3 *Work Package 4: TESTING THE ECF - BASELINE ASSESSMENT*

General information on the WP

WP4 will assess the baseline of the individual and collective competences of the educational community, evaluate the impact of the organisational structures, options, and attitudes on the environmental performance of the selected schools and universities. WP4 will promote the co-design of measures to improve the knowledge, skills, attitudes, and social practices relating to sustainable development through a participatory hybrid approach, including elements from citizen science, citizen engagement, and Participatory Action Research.

WP4 objectives are:

- Elaborating a hybrid participatory approach to evaluate the collective and individual competences of the educational community and to assess the impact of the behaviours and attitudes in the educational performance, through participatory observation, interviews, questionnaires, audits, Internet of Things (IoT) solutions, citizen engagement, and citizen science (task 4.1-4.3);
- Establishing the baseline of collective and individual competences and environmental performance in the selected schools and universities, to provide a basis for the subsequent implementation and evaluation of the sustainability-related interventions (task 4.1-4.3);
- Co-designing measures to strengthen environmental awareness, engage the school community, and strengthen knowledge, skills and attitudes on climate change and sustainable development (task 4.4).
- Implementing organisational structures, in the selected schools and universities, appropriate for addressing climate change and other environmental challenges and for promoting the direct involvement and civic engagement of the entire educational community (task 4.1 and 4.4).

Task information:

Task 4.1: Collective Competences for Sustainability (UAB/JYU)

1.- Revised description of the task

Task 4.1 will assess the baseline of the collective competences for sustainability in schools and universities. It will evaluate the current practices for sustainability, the status of the integration of sustainability concerns, the responsibilities at various levels of management, and the available resources for sustainability policies, such as financial resources and human skills. It will also consider the organisational culture and shared norms concerning sustainability. The task will explore the underlying “intervention theories”, that is, the assumptions inherent in the existing sustainability policies and structures, notably the expected causal relationships between policy interventions, competences, and policy outcomes. This assessment, conducted through interviews with key actors and documentary analysis, will identify enabling and constraining institutional factors (e.g., local, regional, and national-level policies) that condition the implementation and success of sustainable development measures by educational organisations.

This task will support the development of organisational structures, cultures and practices in the schools and universities. It will gather students, teachers, administrative staff, public authorities, civil society organisations, businesses, stakeholders, and representatives from other existing initiatives to promote action against climate change and in favour of sustainable development and environmental protection.

2.- Links from and to other tasks (what/timing)

Task 4.1 will:

- Provide feedback to WP3 based in the testing and participatory evaluation for the validation of the ECF;
- Develop a methodology to assess the school’s performance in WP6;
- Provide specifications needed for the development of material, tools, and applications in WP7;
- Provide input for the dissemination and exploitation of the results in WP8.

Task 4.1 is closely linked to Task 3.3 (development of the initial ECF), given that the collective competences need to be in line with the ECF. Moreover, both tasks 3.3 and 4.1 are led by JYU.

Meetings with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

A post-doctoral researcher at UAB, in cooperation with JYU, will define the methods for assessing the individual competences and for data gathering in all involved countries.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

The assessment of the collective competences, conducted through interviews with key actors and documentary analysis, will identify enabling and constraining institutional factors, and factors in the external environment (e.g., local, regional, national-level policies), that condition the implementation and success of sustainable development measures by educational organisations.

This task will support the development of organisational practices and structures in the schools and universities. It will gather students, teachers, administrative staff, public authorities, civil society organisations, businesses, stakeholders, and representatives from other existing initiatives to promote action against climate change and in favour of sustainable development and environmental protection.

5.- Detailed **partners' involvement** /role/responsibilities (name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|--------------|------|---|-----|
| UAB | 4.1 | Task leader. Development of the methodology for the collective competence assessment. Collective competences assessment in Barcelona. | 3.5 |
| IST | 4.1 | Collective competences assessment pilot schools in Portugal | 4.5 |
| CIEMAT | 4.1 | Collective competences assessment in pilot schools in Madrid and Barcelona | 1.5 |
| USE | 4.1 | Collective competences assessment in Seville pilot schools | 1.5 |
| JYU | 4.1 | Task leader. Development of the methodology for the collective competence assessment. Collective competences assessment in pilot schools in Finland. | 8.5 |
| MedaResearch | 4.1 | Collective competences assessment in pilot schools in Romania | 4.5 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

D4.1 – Report on the baseline assessment of the collective competences of the schools and universities from Portugal, Spain, Finland, and Romania (Month 15).

Responsible partner: UAB

Contributing partners: CIEMAT, USE, JYU, MedaResearch, IST

Delivery date: December 2022

Proposed reviewers: JYU / CIEMAT

Task 4.2: Individual Competences for Sustainability (CIEMAT)

1.- Revised description of the task

Task 4.2 assesses the baseline of the individual competences, knowledge, skills, and daily practices of the school community regarding climate change and sustainable development. This assessment will be conducted through interviews and survey questionnaires, directed at students, teachers, and administrative staff. The aim is to evaluate the perceptions of these groups concerning sustainability, their own capacity to act, the factors (e.g., behavioural, organisational, institutional, and economic) facilitating or hindering the acquisition of sustainability-related knowledge, skills, and attitudes. Particular attention will be paid to factors facilitating or hindering the translation of knowledge, skills, and attitudes into practice, as well as to the perceived effectiveness of the undertaken sustainability measures.

2.- Links from and to other tasks (what/timing)

Task 4.2 will:

- Provide feedback to WP3 based in the testing and participatory evaluation for the validation of the ECF;
- Develop the methodology to assess the performance of the educational establishment in WP6;
- Provide specifications needed for the development of materials, tools, and applications to be developed in WP7;
- Provide input for the dissemination and exploitation of the results in WP8.

Tasks 4.2 is closely linked to Task 3.3 (Development of the initial ECF), given that the collective competences to be assessed need to be aligned with the ECF.

Task 4.2 is also closely linked to task 4.1 (Collective competences for sustainability)

Meetings with JYU and with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

CIEMAT, with the support of a post-doctoral researcher, will define the methods for the assessment of the individual competences and data gathering in all involved countries.

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

The assessment of the individual competences will be performed through interviews and survey questionnaires, directed at students, teachers, and administrative staff

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|--------------|------|--|------------|
| UAB | 4.2 | Individual competences assessment in Barcelona | 5.5 |
| IST | 4.2 | Individual competences assessment in Portugal pilot schools | 4.5 |
| CIEMAT | 4.2 | Task leader. Development of the methodology for the individual competence assessment. Individual competences assessment in Madrid and Barcelona pilot schools | 5.5 |
| USE | 4.2 | Individual competences assessment in Seville pilot schools | 1.5 |
| JYU | 4.2 | Individual competences assessment in Finland pilot schools | 5 |
| MedaResearch | 4.2 | Individual competences assessment in Romania pilot schools | 4.5 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

D4.2 – Report on the Baseline Assessment of the individual competences of the schools and universities from Portugal, Spain, Finland, and Romania (Month 15).

Responsible partner: CIEMAT

Contributing partners: CIEMAT, USE, JYU, MedaResearch, UAB, IST

Delivery date: December 2022

Proposed reviewers: JYU / UAB

Task 4.3: Environmental Performance of the selected educational establishments (IST)

1.- Revised description of the task

Through our hybrid participatory approach Task 4.3 will evaluate the impact of the individual and collective practices on the environmental performance of the selected schools and universities. From a citizen science perspective, this task will encourage the educational community to participate in the process of environmental performance assessment by observing, collecting, gathering and processing data.

The assessments focus on eight dimensions: energy, water and waste management, indoor air quality, transport patterns, green spaces, green procurement and carbon footprint.



Figure 1: Eight dimensions evaluated in the environment performance assessment.

The assessment will draw on a robust scientific methodology, based on the best available evidence, assured by the consortium to guarantee the quality of the collected information.

Assessments will be conducted in 4 phases:

- a) **Pre-audit phase**, consisting of an analysis of the type and quality of the information available in the school or university in question, followed by the elaboration of a common methodology of assessment, harmonised across the pilot schools and universities;
- b) **Site audit phase**, consisting of a detailed analysis of existing building infrastructures and usage patterns as well as relevant constraints and requirements. This information will be used to identify the preferred intervention areas and it will establish the basis upon which WP6 will define the optimal IoT components and respective deployment setups for each pilot site.
- c) **Site assessment**, including IoT solutions developed in WP7, on-site measurement, data collection, questionnaires and visual inspection to assess: energy and water use; efficiency of the existing equipment/systems/management strategies; amount of produced waste per type; transport and mobility patterns of the school community; use of green spaces; green procurement policy; and indoor air quality (IAQ).

Based on the audit phase outcomes (phase b) and the specifications of the required KPIs delivered by WP4, an early version of the IoT framework will be developed in WP7 including a minimum sensor setup to cover the needs of the early baselining activities focusing on critical building performance building aspects (IAQ, human comfort, energy etc). IAQ affects public health both directly and indirectly, as shown for example by the

Covid-19 pandemic. In addition, within this task custom deployment plans will be produced for each pilot site, which will be executed in parallel by all pilot partners to ensure the timely completion of the installations and commissioning of the necessary IoT equipment.

d) Data analysis, generation of the baseline KPIs, production of audit reports and communication of the results to the school community.



Figure 2: Seven steps of the environment performance assessment

An updated final version of the IoT framework services will be provided by WP7 to facilitate both intervention execution and monitoring as well as appropriate information provision to the target users. Final additions to the pilot site IoT equipment will also be performed at this phase if considered necessary.

By providing and installing IoT solutions, new tools, methodologies and devices to measure the environmental performance of the demonstration schools and universities, task 4.3 provides an information basis for the participatory exploration of the causal relationships between behavioural changes and environmental impacts.

Such exploration not only helps these communities to improve their knowledge concerning environmental impacts and associated causal relationships, but also provides them with valuable skills in collective processes of assessment, evaluation and critical self-reflection.

2.- Links from and to other tasks (what/timing)

Task 4.3 will:

- Provide feedback to WP3 based in the testing and participatory evaluation for the validation of the ECF;
- Develop the methodology to assess the school's performance in WP6;
- Provide specifications needed for the development of materials, tools and applications to be developed in WP7;
- Provide input for the dissemination and exploitation of the results in WP8.

WP 7 will support the environment assessment with the development of materials, tools and applications.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner (bold))

Table 1 details the work plan to be followed in task 4.3 identifying the activities to be developed, the methodology, the participants involved, the responsible partner and the dates to accomplish the tasks.

| What | How | Who | When |
|---|---|---|--------------------------------|
| Development of the methodology to perform the environmental performance assessment | Preparation of a detailed document with the methodology, questionnaires, databases and check-lists. | IST + All (to review and comment) | 28 th January 2022 |
| Training course for the ECF4CLIM partners | Webinar session with the presentation of the methodology, followed by discussion and consolidation. | IST + All | 11 th February 2022 |
| Pre-audit | Visits and application of questionnaires and collection of information | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | March 2022 |
| Audit | Measurement of parameters | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | April-June 2022 |
| Data analysis | Utilization of a common database (excel format) | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | July-September 2022 |
| Generation of KPI | Automatic generation through the common database | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | July-September 2022 |

D2.1. Project Management Plan

| | | | |
|---|---|--|------------------------|
| Audit reports | Automatic generation through the common database | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | July-September 2022 |
| Communication | Development of a plan of communication with the schools | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | September 2022 |
| Communication | Communication of the results according the developed plan | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | October 2022 |
| Preparation of the deliverable 4.3 | Compile the results obtained in all pilot schools | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | November-December 2022 |

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The Figure 3 presents the methodology to be used in the development of Task 4.3 indicating the activities and the partners in charge.

| | | | |
|--|--|---|--|
| Development of the methodology for the assessment of the environment performance of the pilot schools: <ul style="list-style-type: none">• Preparation of the manual• Organization of the training course | | IST | |
| Validation of the methodology | | CIEMAT, USE, UAB, JYU, MedaResearch | |
| Implementation of the methodology in pilot schools and universities: <ul style="list-style-type: none">• Pre-audits• Audits• Data analysis• Generation of KPI• Reporting• Communication | | | |
| Spain <ul style="list-style-type: none">• CIEMAT• USE• UAB | Portugal <ul style="list-style-type: none">• IST | Finland <ul style="list-style-type: none">• JYU | Romenia <ul style="list-style-type: none">• MedaResearch |
| Support for the installation of the tools (developed in WP7) in the pilot schools and universities | | | QUE |

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|--------------|------|---|----|
| IST | 4.3 | Task leader. Development of the methodology to assess the environmental performance of the schools. Environmental assessment in Portugal pilot schools | 17 |
| CIEMAT | 4.3 | Environmental assessment in Madrid and Barcelona pilot schools | 3 |
| USE | 4.3 | Environmental assessment in Seville pilot schools | 3 |
| JYU | 4.3 | Environmental assessment in Finland pilot schools | 3 |
| MedaResearch | 4.3 | Environmental assessment in Romania pilot schools | 9 |
| QUE | 4.3 | Support for the installation of tools in all pilot schools | 8 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))



D4.3 – Report on the Baseline Assessment of the environmental performance of the schools and universities from Portugal, Spain, Finland and Romania (Month 16).

Responsible partner: IST

Contributing partners: CIEMAT, USE, JYU, MedaResearch

Delivery date: January 2023

Task 4.4: Co-design of measures to promote competences, behaviours and social practices towards climate action and sustainable development (UAB/CIEMAT)

1.- Revised description of the task

The identification of gaps in Tasks 4.1 and 4.3 will support the definition of measures to empower citizens and promote sustainable behaviours. These solutions will be co-designed through our hybrid participatory approach that will engage students, teachers, administrative staff, academic and practitioners, NGOs, other key stakeholders, and authorities.

The solutions can include:

- structural/environmental interventions,
- organisational measures,
- measures designed to influence individual behaviour and collective practices.

The concrete actions can take the form of:

- specific educational programmes,
- changes in the curricula,
- training and networking events,
- workshops,
- the adoption of good practices.

Task 4.4 will be coordinated by UAB and CIEMAT

2.- Links from and to other tasks (what/timing)

Task 4.4 will:

- Provide feedback to WP3 based on the testing and participatory evaluation;
- Identify measures to be implemented in WP5;
- Provide specifications needed for the development of materials, tools and applications to be developed in WP7;
- Provide input for the dissemination and exploitation of the results in WP8.

Tasks 4.4. is closely linked to previous tasks in WP4 and to Task 3.3 (The development of the initial ECF), given that the suggested measures need to be aligned with the competences in our initial ECF.

Meetings with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

UAB and CIEMAT, with the support of post and pre doctoral researchers from both institutions, will design the hybrid participatory approach and support the project partners in Spain, Portugal, Romania, and Finland in its implementation.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

Sustainability Competence Teams (SCT) will be set up to analyse the assumptions concerning the mechanisms, and conditions required for the interventions to achieve their objectives, that is, for improving sustainability competences and environmental performance.

SCTs will be established at the different demonstration sites, one consisting of student representatives, the second of teachers, and, when appropriate, a third of administrative staff. Every SCT will meet several times during the project, according to a pre-established schedule that will be agreed with the participants. The possibly pre-existing structures in the educational institution in question will be considered and built upon to avoid overlaps and unnecessary extra burdens for the institution. The singularities and needs of the demonstration sites will always be considered, in a process that is flexible and adaptable.

The first SCT meeting will promote reflection on the existing competences and on the preferences for moving towards more sustainable behaviours and practices. Stimulus materials will be used (during and after the group meetings) to present key sustainable challenges and potential competences. The second SCT meeting will identify the most suitable measures for promoting sustainability and improving competences. Views on gender aspects will be gathered through questionnaire data and interviews. By month 16, both the first and the second SCT will have taken place.

Sustainability Competence Committees (SCC) will be established at all demonstration sites. The committees will consist of representatives from the SCTs and other actor groups relevant in the educational community, such as practitioners, NGOs, other stakeholders, and authorities. Rapporteurs from each of the three SCTs (students, teachers, administrative staff) will present to the SCCs the challenges and proposals identified in their groups. A deliberative co-design process will be generated, whereby the groups jointly design the measures that they deem as the most suitable for fostering sustainability in their own school or university.

The SCCs will also meet twice in WP5, following the first and second sessions of the SCT. Meetings, peer learning, and peer counselling activities will be promoted amongst the pilot schools, involving teachers and students, to share the findings and outcomes from the various demonstration sites. In addition, digital media will be used to engage a wider community, to foster exchange of experiences with other schools and universities, parents, municipalities and other public authorities.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|--------------|------|--|----------|
| UAB | 4.4 | Task leader. Development of the methodology. Support for the design of measures and working structures (SCT and SCC) in Barcelona | 7 |
| IST | 4.4 | Support to the creation of measures and working structures (SCT and SCC) in Portugal pilot schools | 9 |
| CIEMAT | 4.4 | Task leader. Support to the creation of measures and working structures (SCT and SCC) in Madrid and Barcelona pilot schools | 3 |
| USE | 4.4 | Support to the creation of measures and working structures (SCT and SCC) in Seville pilot schools | 7 |
| JYU | 4.4 | Support to the creation of measures and working structures (SCT and SCC) in Finland pilot schools | 8 |
| MedaResearch | 4.4 | Support to the creation of measures and working structures (SCT and SCC) in Romania pilot schools | 9 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

D4.4 – Report on the Compilation of measures co-designed by the educational communities and presented at school and university events (Month 21).

Responsible partner: UAB

Contributing partners: CIEMAT, USE, JYU, MedaResearch, IST

Delivery date: June 2023

Proposed reviewers: JYU / CIEMAT

WP5

2.1.4 *Work Package 5: TESTING THE ECF: INTERVENTIONS*

General information on the WP

WP5 will implement a wide range of practical, replicable, and scalable climate change and sustainability interventions within the educational community. The interventions include both structural and behavioural measures. These demonstration activities serve as a tool for monitoring progress and assessing the improvement of ECF competences. The specific interventions will be co-designed through the hybrid participatory process initiated in WP4 and following the European Competence Framework methodology defined in WP3. Key performance indicators (KPIs) - as a key component of the interventions - are employed as a tool that allows the participants to analyse and assess the viability and impact of climate and sustainability actions, and thereby gain competences. The educational communities will be mobilised in a process of analysing and proposing solutions to their specific challenges and identifying further opportunities. WP5 applies a hybrid participatory approach that helps the participants to gain individual and collective competences. The educational communities will propose specific interventions, evaluating their viability and impact on climate and sustainability, at various levels of analysis. Open calls will be widely disseminated within the community to increase awareness and participation. The interventions will include both structural (e.g., small-scale retrofitting solutions, creation of green spaces, green procurement procedures – T5.1) and behavioural (aimed at changing habits, routines, social norms, organisational structures and practices, etc. T5.2) measures. These measures will be designed and implemented in an inclusive manner, in line with the principles of Participatory Action Research, which will respect the agency and ownership of school teachers, students and staff in their efforts to bring about a shift towards sustainability.

WP5 objectives are:

- co-design of the interventions outlined in general terms in WP4
- participatory execution and monitoring of the selected interventions and actions
- monitoring of the acquisition of individual and global competences

Task information:

Task 5.1: Behavioural Interventions (individual /organisational) to modify practices, routines, habits, and social norms concerning climate change and sustainability in education

1.- Revised description of the task

This task designs and integrates behavioural actions to improve educational communities' environmental performance according to the competences described in WP3. They consist of easy and inexpensive measures that can considerably improve the involved institutions' environmental performance. Two subtasks will be undertaken:

- **Definition of the actions.** Solutions will be co-designed through our hybrid participatory process. Awareness-raising campaigns, targeted to all sectors of the given educational community, will be designed to foster the acquisition of competences in the areas of climate change and sustainability amongst school communities. The actions will include the establishment of labs and activities for learning on topics such as energy efficiency, water, bio products, sustainable transport, circular economy, thermal comfort, and air quality. The educational community in question will establish and manage these structures and activities with the support of experts of ECF4CLIM, representing diverse fields of expertise. The labs and actions will apply the principles of citizen science, thereby contributing to the acquisition of skills and knowledge by generating local data, engaging citizens in concrete action, and raising awareness in sustainability and climate change.

- **Execution and monitoring of actions.** The actions will be executed and monitored to assess their impacts on climate and sustainability, applying key performance indicators. Indicators serve here as a tool that allows the participants to gain new competences in climate change and sustainable development. Special focus will be given to defining data-driven KPIs allowing for a continuous assessment of different performance vectors based on live building data-streams. This will offer dynamic KPIs that establish systematic links between user actions, building operations, and different aspects of performance (indoor air quality, human comfort, energy performance, etc.).

2.- Links from and to other tasks (what/timing)

Task 5.1 will:

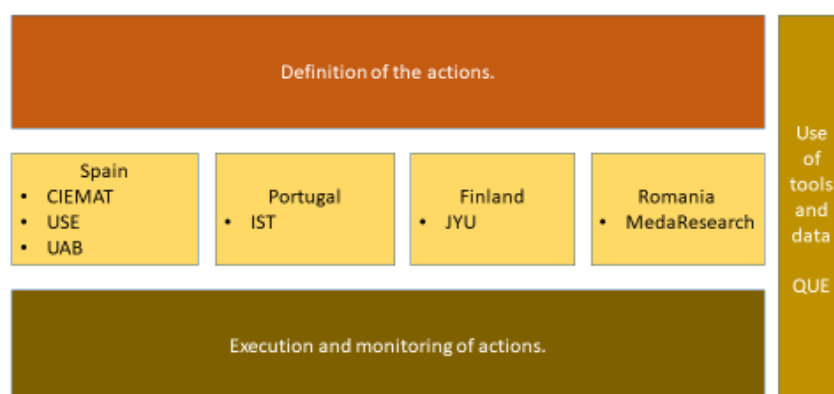
- provide feedback to WP3 and WP4 based on the testing and participatory evaluation for the validation of the ECF;
- receive definition of the measures from WP4;
- use the materials, tools and applications to be developed in WP7;
- provide input for the dissemination and exploitation of the results in WP8.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

| What | How | Who | When |
|---|--|---|--------------------------------------|
| Definition of the actions | Awareness-raising campaigns, targeted to all sectors of the given educational community | USE + All | M18 (March 2023) |
| | Establishment of labs and activities | USE + All (specific and defined by each community) | M18 (March 2023) |
| Execution and monitoring of actions. | Execution and monitoring of actions in the pilot establishments. | USE+ All | M19-M36 April 2023-September 2024 |
| | Data analysis. Utilisation of a common database | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch QUE: data from Tools and IoT. | |
| | Support & Communication. Support in the implementation to the communities. Decision-making supported by KPIs | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch QUE: data from the tools | |
| Preparation of the deliverable 5.1 | Definition of interventions and actions to be implemented | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | M24 |

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

The figure presents the methodology to be used in the development of Task 5.1, indicating the activities and the partners in charge.



The methodology comprises two stages, in which the educational community first defines the actions, and then implements them.

This task provides the local consortium members and developers with support and assistance in tool design and data acquisition. Both stages will use the tools developed in WP7 to facilitate and monitor the acquisition of competences. KPIs will be used for these purposes.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|---------|------|--|----|
| CIEMAT | 5.1 | Design and integration of behavioural actions to improve educational communities' environmental performance. Execution and monitoring of the participatory process in Madrid pilot establishments | 3 |
| IST | 5.1 | Design and integration of behavioural actions to improve educational communities' environmental. Execution and monitoring of the participatory process in Portuguese pilot establishments | 9 |
| USE | 5.1 | Task leader. Design and integration of behavioural actions to improve educational communities' environmental. Execution and monitoring of the participatory process in Seville pilot establishments | 11 |
| JYU | 5.1 | Design and integration of behavioural actions to improve educational communities' environmental. Execution and monitoring of the participatory process in Finland pilot establishments | 9 |
| UAB | 5.1 | Design and integration of behavioural actions to improve educational communities' environmental. Execution and monitoring of the participatory process in the pilot establishment in Barcelona (University of Barcelona) | 3 |

| | | | |
|--------------|------------|--|---|
| MedaResearch | 5.1 | Design and integration of behavioural actions to improve educational communities' environmental. Execution and monitoring of the participatory process in Romania pilot establishments | 9 |
| QUE | 5.1 | Support for the use of tools in all pilot establishments. Data management and outputs from the use of tools | 3 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- D5.1 Definition of interventions and actions to be implemented

Responsible partner: USE

Contributing partners: CIEMAT, IST, USE, JYU, UAB, MedaResearch, QUE

Delivery date: Month 24

Task 5.2: Structural/Environmental Interventions (energy, water, green procurement, green spaces, transport, indoor air quality, waste).

1.- Revised description of the task

This task involves developing small-scale demonstration solutions, which consist of co-designing actions to improve sustainability jointly with the educational community. These actions are conceived as a learning-by-doing process, with participation of community agents and experts in each area. The task is divided into:

- Definition of interventions to be implemented. Based on the previous work in WP4 and the support of the tools and catalogues developed in WP7, the educational community defines the interventions through a participatory and deliberative process. Experts from diverse fields support the actions design process. Sustainability KPIs will be used as tools easy to access for supporting the process.
- Execution and monitoring of interventions. The participants will monitor and assess the impacts of the implemented actions by using key performance indicators, and thereby gain competences in the areas of climate change and sustainable development. As in T5.1, the definition of dynamic and data-driven KPIs will offer critical insights into the continuous balance between different (and often conflicting) performance vectors (energy, indoor air quality, human comfort, etc) through the analysis of live data streams from the buildings in question.

2.- Links from and to other tasks (what/timing)

Task 5.2 will:

- Provide feedback to WP3 and WP4 based on the testing and participatory evaluation for the validation of the ECF;
- Receive measures from WP4;
- Use the materials, tools and applications to be developed in WP7;
- Provide input for the dissemination and exploitation of the results in WP8.

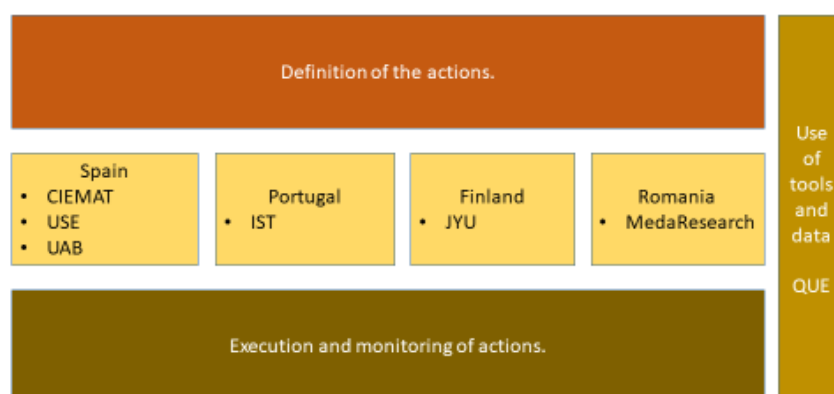
3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

| What | How | Who | When |
|--|--|---|--|
| Definition of the actions. | The educational community defines the interventions through a participatory and deliberative process. Experts from diverse fields support the actions design process | USE + All | M18 (March 2023) |
| | Use of tools for supporting the process | | M18 (March 2023)/ M21 (June 2023) |
| Execution and monitoring of actions. | Execution and monitoring of actions in the pilot establishments. | USE+ All | M19-M36 April 2023- September 2024 |
| | Support & Communication. Support in the implementation to the communities. Use of KPIs to assess their potential impacts | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch QUE: data from the tools | |
| Preparation of the deliverables 5.2 & 5.3 | Report on execution and monitoring of interventions and actions Report on the identified interventions and actions | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | M23,M34 |

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The following figure *presents the* methodology to be used in the development of Task 5.2, indicating the activities and the partners in charge.

D2.1. Project Management Plan



The methodology comprises two stages whereby the educational community first defines the actions and then implements them.

This task provides the local consortium members and developers with support and assistance in tool design and data acquisition. Both stages will use the tools developed in WP7 to facilitate and monitor the acquisition of competences. KPIs will be used for these purposes.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Task | Role | PM |
|---------|------|---|----|
| CIEMAT | 5.2 | Design and integration of structural/environmental actions to improve educational communities' environmental performance. Participatory process execution and monitoring in Madrid pilot establishments | 3 |
| IST | 5.2 | Design and integration of structural/environmental actions to improve educational communities' environmental. Participatory process execution and monitoring in Portuguese pilot establishments | 9 |
| USE | 5.2 | Task leader. Design and integration of structural/environmental actions to improve educational communities' environmental. Participatory process execution and monitoring in Seville pilot establishments | 11 |
| JYU | 5.2 | Design and integration of structural/environmental actions to improve educational communities' environmental. Participatory process execution and monitoring in in Finland pilot establishments | 9 |
| UAB | 5.2 | Design and integration of structural/environmental actions to improve educational communities' environmental. Execution and monitoring in the pilot establishment in Barcelona (University of Barcelona). | 3 |

| | | | |
|--------------|------------|--|---|
| MedaResearch | 5.2 | Design and integration of structural/environmental actions to improve educational communities' environmental. Participatory process execution and monitoring in Romania pilot establishments | 9 |
| QUE | 5.2 | Support for the use of tools in all pilot establishments. Data management and outputs from the use of tools. | 3 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- D5.2 Report of Execution and monitoring of interventions and actions

Responsible partner: USE

Contributing partners: CIEMAT, IST, USE, JYU, UAB, MedaResearch, QUE

Delivery date: Month 45

- D5.3 Report on the identified interventions and actions

Responsible partner: USE

Contributing partners: CIEMAT, IST, USE, JYU, UAB, MedaResearch, QUE

Delivery date: Month 45

Task 5.3: Joint implementation: Participatory, reflective, and deliberative process to support the interventions (UAB/CIEMAT)

1.- Revised description of the task

Following our hybrid participatory approach, two additional sessions of the same reconvened focus groups that met twice in Task 4.3 (SCT sessions 3 and 4) will be organised. In addition, two sessions of the Sustainability Competence Committees will be organised, as in WP4, to generate a wide deliberative process of reflection amongst the wider educational community (NGOs, relevant public and private-sector organisations, etc.). Through the deliberative process, all actors involved in the interventions will engage in joint reflection on whether and how the interventions have affected their competences and capabilities to act towards sustainability.

2.- Links from and to other tasks (what/timing)

Task 5.3 is closely linked to task 4.3, as both employ the same methodological approach. Both tasks are led by UAB/CIEMAT.

Task 5.3 is also closely linked to Task 3.3 (development of the initial ECF).

Meetings with JYU and with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

UAB and CIEMAT, with the support of post- and pre-doctoral researchers from both institutions, will be in charge of designing the hybrid participatory approach, and supporting the project partners in Spain, Portugal, Romania, and Finland in its implementation.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

- Sustainability Competence Teams' (SCT) session 3 will take place a few months after the start of the intervention (depending on the school term dates), to gather the first experiences and impressions from students, teachers, and organisational staff. Findings from the SCT meetings will be shared in the Sustainability Competence Committees (SCC) (session 3) so the wider educational community (at each demonstration site) can reflect on the advancement of the interventions, suggest modifications or changes, and

gather preliminary insights on how the interventions are helping to improve competences (or otherwise).

- The fourth SCT session will be held by the middle of the intervention period (depending on school term dates) to further track the process and promote deliberation and reflection. Findings from this session will be shared at the fourth session of the SCC.

- Data analysis: qualitative and quantitative evidence generated by the SCTs and SCCs at all demonstration sites will be analysed including cross-country, cross-educational and cross-gender analysis.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|---|----|
| UAB | 5.3 | Task leader. Data gathering in Spain (Barcelona) | 7 |
| CIEMAT | 5.3 | Participant. Data gathering in Spain (Madrid and Barcelona) | 7 |
| JYU | 5.3 | Participant. Data gathering in Finland | 9 |
| IST | 5.3 | Participant. Data gathering in Portugal | 9 |
| USE | 5.3 | Participant. Data gathering in Spain (Seville) | 3 |
| MedaResearch | 5.3 | Participant. Data gathering in Romania | 9 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- D.5.4. Key findings from the joint implementation of the interventions. Lead Beneficiary: UAB. Due date: Month 45
- Proposed reviewers: JYU / CIEMAT

WP6

2.1.5 Work Package 6: TESTING THE ECF: PARTICIPATORY EVALUATION

General information on the WP

Building on WP4 and WP5, WP6 organises a process of participatory and deliberative evaluation. The evaluation focuses on the capacity of the interventions to enhance the individual and collective sustainability-related competences, and to improve the performance of the selected educational organisations and institutions in the areas of climate change and sustainability. Such a participatory and deliberative approach helps to identify and accurately and reliably describe the causal relationships between an intervention and its outcomes. Participation and deliberation engender a process of continuous collective learning, improvement, and competence-building.

The evaluation encompasses also the broader institutional factors that condition the success of the interventions. Evaluation is vital for the identification of obstacles, reasons for success and failure, and for the design of appropriate and context-sensitive solutions.

Task information:

Task 6.1: Evaluation of the collective (organisational/institutional) competences: policies, measures, and practices for climate action and sustainability (UAB/JYU)

1.- Revised description of the task

To gather empirical evidence on the impact of the interventions on collective competences, a second wave of the interviews and/or short surveys applied in WP4 (baseline) (Task 4.1) will be conducted. The evidence gathered from the SCTs and SCCs (WP4 and WP5) will provide further valuable material for this evaluation.

- Tentative topics of analysis (to be specified through the participatory process): changes in organisational and institutional competences; organisational culture; integration of sustainability concerns and allocation of responsibilities at various levels of management; human and financial resources for sustainability policies.
- Identification and analysis of the role of enabling and constraining contextual factors: local, regional, and national policies and institutions that condition the implementation and success of the interventions within the educational organisation in question.

2.- Links from and to other tasks (what/timing)

This task will be closely linked to Task 4.1 (also led by UAB/JYU), as the very same interviews and/or short surveys will be implemented twice (in tasks 4.1. and 6.1).

This task will be closely linked to Task 4.4. and Task 5.3, and more precisely to the four first SCT and SCC meetings. Tasks 4.4 and 5.3 are led by UAB/CIEMAT.

Thus, UAB leads or co-leads all tasks relevant for the execution of Task 6.1.

Meetings with JYU and with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

This Task will be led by UAB, in particular by Josep Espluga, in close collaboration with JYU and with the support of post- and a pre-doctoral researcher. This task runs from month 36 until the end of the project.

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

- Interviews and/or short surveys with administrative staff, teachers and/or students to gather evidence on the collective competences at the end of the participatory processes

•

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|---------|-------|---|-----|
| UAB | 6.1 | Task leader. Data gathering in Spain (Barcelona) | 3.5 |
| JYU | 6.1 | Task leader. Data gathering in Finland | 6.5 |
| CIEMAT | 6.1 | Participant. Data gathering in Spain (Madrid and Barcelona) | 1.5 |
| IST | 6.1. | Participant. Data gathering in Portugal | 4.5 |

| | | | |
|--------------|-----|--|-----|
| USE | 6.1 | Participant. Data gathering in Spain (Seville) | 1.5 |
| MedaResearch | 6.1 | Participant. Data gathering in Romania | 4.5 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- D.6.1. Evaluation of the collective competences. Lead Beneficiary: UAB. Due date: Month 40
- Proposed reviewers: JYU / CIEMAT

Task 6.2: Evaluation of the individual competences: knowledge, skills, attitudes (CIEMAT)

1.- Revised description of the task

A second wave of interviews and/or surveys in WP4 (baseline, Task 4.2) will be carried out to gather empirical evidence on the impacts of the interventions on individual competences. The qualitative evidence gathered from the SCTs and SCCs (WP4 and WP5) will provide further insights into the potential impacts and their root causes.

- Tentative topics of analysis: changes in the patterns, practices, routines, social norms (e.g., perceptions concerning sustainability; capacity to act; effectiveness of the interventions; factors facilitating or hindering the acquisition of knowledge, skills, and new attitudes).
- Identification and analysis of factors that facilitate or hinder the strengthening of individual competences in the areas of climate change and sustainability.

2.- Links from and to other tasks (what/timing)

This task is closely linked to Task 4.2 (also led by CIEMAT), as the same interviews and/or short surveys will be implemented twice (in tasks 4.2. and 6.2).

This task is closely linked to tasks 4.4. and 5.3, and more precisely to the four first SCT and SCC meetings. Tasks 4.4 and 5.3 are led by UAB/CIEMAT. Thus, CIEMAT leads or co-leads all tasks relevant for the execution of Task 6.2.

Meetings with JYU and with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

This Task will be led by CIEMAT, in particular by Ana Prades with the support of a post-doctoral researcher. This task runs from month 36 until the end of the project.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

- Interviews and/or short surveys with administrative staff, teachers and/or students to gather evidence on the individual competences at the end of the participatory processes.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|---|-----|
| CIEMAT | 6.2 | Task leader. Data gathering in Spain (Madrid and Barcelona) | 5.5 |
| UAB | 6.2 | Participant. Data gathering in Spain (Barcelona) | 1.5 |
| JYU | 6.2 | Participant. Data gathering in Finland | 4.5 |
| IST | 6.2 | Participant. Data gathering in Portugal | 4.5 |
| USE | 6.2 | Participant. Data gathering in Spain (Seville) | 1.5 |
| MedaResearch | 6.2 | Participant. Data gathering in Romania | 4.5 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- D.6.2. Evaluation of the individual competences. Lead Beneficiary: CIEMAT. Due date: Month 40
- Proposed reviewers: UAB / JYU

Task 6.3: Environmental evaluation of the selected educational establishments (IST)

1.- Revised description of the task

Task 6.3 will evaluate the work progress and quantify the success achieved with the structural, behavioural, and joint interventions implemented in WP5. In order to do that, pilot schools and universities will be involved in new environment assessments according to the strategy implemented in WP4, which include IoT solutions, on-site measurement, data collection, questionnaires and visual inspection to evaluate the impact of the low-carbon solutions on the energy and water use, amount of produced waste, transport patterns of the school community, use of green spaces, green procurement policy and indoor air quality. The evolution of the environment performance indicators will be analysed, communicated, and discussed through the entire school community.

2.- Links from and to other tasks (what/timing)

Task 6.3 will:

- Provide feedback to WP3 based in the testing and participatory evaluation for the validation of the ECF;
- Assess the measures implemented in WP5;
- Provide input for the dissemination and exploitation of the results in WP8.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

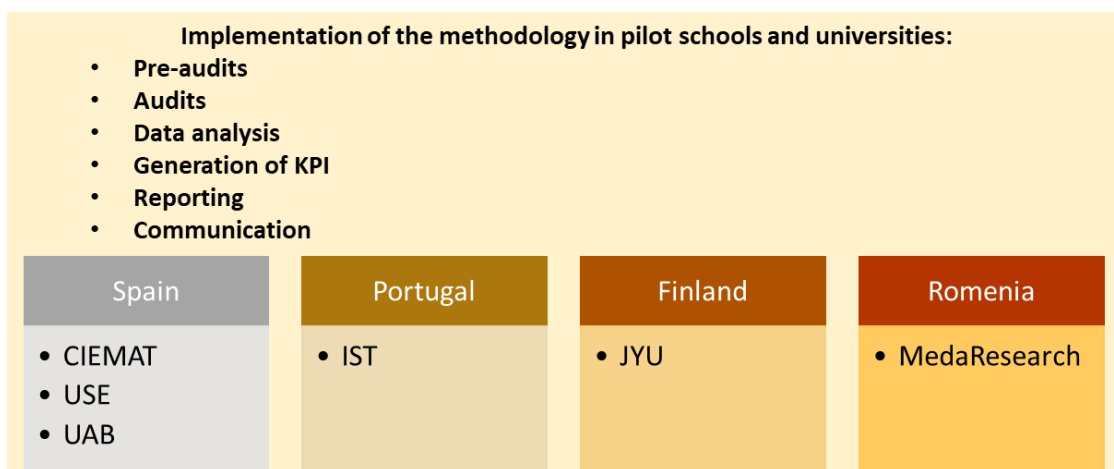
| What | How | Who | When |
|------------------|---|---|---------------|
| Pre-audit | Application of questionnaires and collection of information | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | October 2024 |
| Audit | Measurement of parameters | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | November 2024 |

D2.1. Project Management Plan

| | | | |
|---|--|---|---------------|
| Data analysis | Utilisation of a common database (excel format) | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | December 2024 |
| Generation of KPI | Automatic generation through the common database | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | December 2024 |
| Audit reports | Automatic generation through the common database | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | December 2024 |
| Communication | Development of a plan of communication with the establishments | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | January 2025 |
| Communication | Communication of the results according the developed plan | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch | January 2025 |
| Preparation of the deliverable 6.3 | Compile the results obtained in all pilot establishments | PT: IST; SP: CIEMAT, USE, UAB; FI: JYU; RO: MedaResearch + QUE | January 2025 |

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The following figure the methodology to be used in the development of Task 6.3 indicating the activities and the partners in charge.



5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|---|----|
| IST | 6.3 | Task leader. Data gathering in Portugal | 17 |
| UAB | 6.3 | Participant. Data gathering in Spain (Barcelona) | 3 |
| CIEMAT | 6.3 | Participant. Data gathering in Spain (Madrid and Barcelona) | 3 |
| JYU | 6.3 | Participant. Data gathering in Finland | 9 |
| USE | 6.3 | Participant. Data gathering in Spain (Seville) | 3 |
| MedaResearch | 6.3 | Participant. Data gathering in Romania | 9 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

D.6.3. Environmental performance of the schools and universities in Portugal, Spain, Finland, and Romania (Month 40)

Responsible partner: IST

Contributing partners: CIEMAT, USE, JYU, MedaResearch

Delivery date: January 2025

Task 6.4: Participatory evaluation of the interventions (UAB)

1.- Revised description of the task

Through our hybrid participatory approach, all involved actors will explore and possibly revisit their 'intervention theories', in light of the experience gained. The exploration focuses on the relation between the expected and actually observed causal relationships between policy interventions and competences, asking questions such as:

- did the intervention operate as expected?
- did the basic assumptions hold?
- which unanticipated factors constrained or facilitated the improvement of sustainability competences?
- did the intervention and the evaluation process foster empowerment of the involved stakeholders, by helping them to better identify opportunities for and obstacles to desired changes towards sustainability?"

2.- Links from and to other tasks (what/timing)

Task 6.4 is closely linked with task 4.4 (SCC and SCT sessions 1 and 2), and 5.3 (SCC and SCT sessions 3 and 4). Thus, the same methodology will be implemented at six occasions throughout the project. Notably, UAB, the institution in charge of this task also co-leads with CIEMAT tasks 4.4. and 5.3.

Task 6.4 is closely linked to Task 3.5 (Internal and External validation of the ECF, led by JYU).

Meetings with JYU and with partners in charge of data gathering at the demonstration sites will be held when necessary.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

- Sustainability Competence Teams session 5 will take place a few months before the end of the intervention (depending on the school term dates), to gather the first experiences and impressions from students, teachers, and organisational staff. Findings from the session will be shared in the Sustainability Competence Committees (session 5), to allow the wider educational community (at each demonstration site) to reflect on how the interventions operated in producing their outcomes, both at the individual and the collective levels.
- The last (6th) SCT session will be held by the end of the intervention (depending on school term dates) to gather suggestions and recommendations from

students, teachers, and organizational staff on ways of further improving the competences and fostering their wider acquisition in the educational community at large. Findings from this session will be shared and explored at the final (6th) session of the SCC.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

To organise this process of participatory reflection on whether and how the interventions operated as expected and whether the competences improved and why, the deliberative model (SCTs and SCCs) employed in Tasks 4.4 and 5.3. will be applied again.

- Data analysis: evidence generated by the SCTs and SCCs concerning the capacity of the interventions to enhance the individual and collective sustainability-related competences, and their ability to improve the environmental performance at the demonstration sites will be analysed. This analysis includes comparisons across countries and between educational levels. Gender aspects will receive special attention.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|---|----|
| UAB | 6.4 | Task leader. Data gathering in Spain (Barcelona) | 9 |
| CIEMAT | 6.4 | Participant. Data gathering in Spain (Madrid and Barcelona) | 5 |
| JYU | 6.4 | Participant. Data gathering in Finland and leader of the ECF internal and external validation | 9 |
| IST | 6.4 | Participant. Data gathering in Portugal | 9 |
| USE | 6.4 | Participant. Data gathering in Spain (Seville) | 3 |
| MedaResearch | 6.4 | Participant. Data gathering in Romania | 9 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))



- D.6.4. Exploration of intervention theories. Lead Beneficiary: UAB. Due date:
Month 45
- Proposed reviewers: JYU/ CIEMAT

Task 6.5: Proposals and recommendations on key components and requirements for the ECF, and ways of improving social practices in education to promote climate action and sustainable development (CIEMAT)

1.- Revised description of the task

Proposals and recommendations on key components and requirements for the ECF, and ways of improving social practices in education to promote competences in climate action and sustainable development.

2.- Links from and to other tasks (what/timing)

Task 6.5 will be closely linked to all WP6 tasks and to Tasks 3.5 (Internal and External Validation of the ECF), led by JYU.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The CIEMAT project coordinators will integrate the proposals and recommendations emanating from WP6 and WP3.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

There is no specific methodology for this task.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|-------------------------|----|
| CIEMAT | 6.5 | Task leader. | 5 |
| UAB | 6.5 | Provide recommendations | 3 |
| JYU | 6.5 | Provide recommendations | 1 |
| IST | 6.5 | Provide recommendations | 1 |
| USE | 6.5 | Provide recommendations | 1 |
| MedaResearch | 6.5 | Provide recommendations | 1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- D.6.5. Proposals and recommendations for the validated ECF. Lead Beneficiary: CIEMAT. Due date: Month 45
- Proposed reviewers: JYU/ UAB

WP7

2.1.6 *Work Package 7: DIGITAL PLATFORM TO PROMOTE ACTIVE LEARNING AND CITIZEN INVOLVEMENT*

General information on the WP

WP7 aims to strengthen environmental awareness amongst citizens and promote the engagement of the entire educational community in action towards behavioural changes towards sustainability.

The platform will allow the elicitation and dissemination of the ideas for citizen climate actions, stimulate initiatives, create a critical mass for the success of the actions and initiatives, evaluate the activities, and offer access to applications for active learning.

Task information:

Task 7.1: Architecture design and technical requirements of the ECF4CLIM digital platform

1.- Revised description of the task

- To define an appropriate concept for the digital platform, dialogues with stakeholders and desk research.
- Design the architecture, interfaces and functional specifications needed for an efficient integration of software and hardware components defined in ECF4CLIM.
- Data regarding the technology solutions currently in operation in the pilot facilities and available interfaces to external IT systems will dictate the level of interoperability currently available and address the technical needs of the newly developed solutions to ensure end-to-end systems compatibility.

2.- Links from and to other tasks (what/timing)

This task entails designing the entire workflow consisting of all information related to crowdsourcing space outputs (task 7.2), simulation tools (task 7.3), IoT solutions data for real time monitoring (task 7.4) and learning space (task 7.5).

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Lead Partner: SMARTWATT Participants: CIEMAT, IST, USE, ISQ, TREBAG, QUE

- Deliverable 7.1 ECF4CLIM digital platform - landing Page - M3, December 2021
- Deliverable 7.2 ECF4CLIM digital platform architecture - M6, March 2022
- D7.3 ECF4CLIM digital platform - Module 1 - Crowdsourcing collaborative space - M4, January 2022
- D7.4 ECF4CLIM digital platform - Module 2 - Simulators space - M12, September 2022
- D7.5 ECF4CLIM digital platform - Module 3 - IoT Ecosystem space - M12, September 2022
- D7.6 ECF4CLIM digital platform - Module 4 - Learning space - M24, September 2023

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

Determine the set of functional, deployment and technical system specifications, interfacing and information flows between the different system components, covering all operational states of the ECF4CLIM framework and guiding subsequent development tasks.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|-----------|-------|--|-----|
| CIEMAT | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 0.5 |
| IST | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 1 |
| USE | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 0,5 |
| ISQ | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 3 |
| Trebag | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 0.5 |
| Smartwatt | 7.1 | Task leader. Architecture design and technical requirements of the ECF4CLIM digital platform | 12 |
| QUE | 7.1 | Participant. Provide inputs to the architecture design of the ECF4CLIM digital platform | 8 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- Deliverable 7.1 ECF4CLIM digital platform - landing Page - M3, December 2021; responsibility: Smartwatt
- Deliverable 7.2 ECF4CLIM digital platform architecture - M6, March 2022; responsibility: Smartwatt
- D7.3 ECF4CLIM digital platform - Module 1 - Crowdsourcing collaborative space - M4, January 2022; responsibility: Smartwatt
- D7.4 ECF4CLIM digital platform - Module 2 - Simulators space - M12, September 2022; responsibility: Smartwatt
- D7.5 ECF4CLIM digital platform - Module 3 - IoT Ecosystem space - M12, September 2022; responsibility: Smartwatt
- D7.6 ECF4CLIM digital platform - Module 4 - Learning space - M24, September 2023; responsibility: Smartwatt

Task 7.2: Crowdsourcing collaborative space

1.- Revised description of the task

A crowdsourcing tool integrated to the digital platform, selected amongst those existing in the market.

The aim is to engender a process, whereby a large, international group of students, parents, teachers and experts in education engage in collective meaning-making.

2.- Links from and to other tasks (what/timing)

The crowdsourcing tool selected for the crowdsourcing activity which runs under WP3 – task 3.1 will be integrated to the digital platform, during the first months of the project.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task leader: JYU Participants: SMARTWATT, ISQ

- Deliverable 7.7 Link to Crowdsourcing Collaborative Tool - M4, January 2022

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

Crowdsourcing following the principles of citizen science, to collect their opinions on how to conceptualize the competences of climate action and sustainable development, in opposition to strategies based on desk research/literature review only.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|-----------|-------|---|----|
| JYU | 7.2 | Task leader. Crowdsourcing collaborative space | 2 |
| ISQ | 7.2 | Participant. Provide inputs to crowdsourcing collaborative space | 2 |
| Smartwatt | 7.2 | Participant - Provide inputs to crowdsourcing collaborative space | 4 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- Deliverable 7.7 Link to Crowdsourcing Collaborative Tool - M4, January 2022; responsibility: JYU

Task 7.3: Simulation Tools

1.- Revised description of the task

In this task, tools that will be used in the definition, designing and evaluation of the interventions in the educational establishments will be designed, programmed and integrated in the platform:

- Environmental Footprint Calculator
- Retrofitting tool kit
- Tool for evaluating the sustainability of interventions

2.- Links from and to other tasks (what/timing)

Task 7.3 - The Environmental Footprint calculator will connect the baseline data (collected in WP4) and will allow users update and simulate improvements for self-assessment (as part of the participatory methodology developed in WPs 4, 5, and 6). The effect of the different measures implemented in WP5 (e.g., retrofitting, measures to foster behavioural change) will be quantified using the LCA-based tool.

Task 7.3 - Tool for evaluating the sustainability of interventions - key performance indicators (KPIs) will be defined to properly address the specificities of the educational sector. These KPIs will be also used in WP4, WP6 and Task 7.4 to characterize the environmental baseline of the schools and universities and, at the same time, to evaluate the impact of different projects and initiatives in their performance.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task leader: CIEMAT Participants: SMARTWATT, USE

- Deliverable 7.8 Environmental footprint calculator version I and II. CIEMAT - M12, September 2022
- Deliverable 7.9 Retrofitting tool kit. CIEMAT - M12, September 2022
- Deliverable 7.10 Interventions Sustainability evaluation tool. USE. M24, September 2023

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

- Environmental Footprint Calculator

Develop a tool to support the environmental self-assessment of the educational establishments and the educational community.

Based on Life Cycle Assessment methodologies and will connect the baseline data (collected in WP4) and will allow users update and simulate improvements for self-assessment (as part of the participatory methodology developed in WPs 4, 5, and 6). The effect of the different measures implemented in WP5 will be quantified using this LCA-based tool.

- Retrofitting tool kit

Evaluating the energy savings achieved by the implementation of various retrofitting measures in school and university premises. This tool gathers the initial building information, queries the simulation database available, and quantifies the retrofitting percentage reached by the measure selected. It allows estimating the energy response of a representative classroom, when different retrofitting measures are implemented.

Maps that assist in designing energy-saving retrofitting measures in buildings. Seasonal maps will be developed to highlight the thermal comfort zone inside a building and different energy efficiency measures to achieve this thermal neutrality.

- Tool for evaluating the sustainability of interventions

A tool with sustainability indexes employing a multi-criteria methodology to assess the environmental performance of schools and their community.

The environmental sectors are assessed via key performance indicators that will be defined to properly address the specificities of the educational sector.

When using this tool, users introduce data to facilitate the participation of a wide range of people, of different ages and varying levels of expertise.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc)

| Partner | Tasks | Role | PM |
|-----------|-------|--|------|
| CIEMAT | 7.3 | Task leader. Simulation tools - Environmental footprint calculator version I and II, and Retrofitting tool kit | 20,5 |
| USE | 7.3 | Participant. Simulation tools - Tool for evaluating the sustainability of interventions | 10,5 |
| Smartwatt | 7.3 | Participant. Provide support to the development of the simulation tools | 25 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable 7.8 Environmental footprint calculator version I and II - M12, September 2022; responsibility: CIEMAT
- Deliverable 7.9 Retrofitting tool kit - M12, September 2022; responsibility: CIEMAT
- Deliverable 7.10 Interventions Sustainability evaluation tool - M24, September 2023; responsibility: USE

Task 7.4: IoT Ecosystem for Multipurpose Monitoring.

1.- Revised description of the task

IoT framework for non-intrusive collection of building information, comprising distributed multiprotocol gateways and an IoT cloud-based information management layer offering powerful sensor fusion and data analytics services.

Delivery of a fine-tuned & customized, robust & privacy-friendly IoT infrastructure. The development of the ECF4CLIM IoT digital platform will consist of appropriately designed distributed sensor networks for each pilot site, managed by a building multiprotocol gateway.

Live building sensor data streams relevant to human comfort along with energy submetering and relevant building device/system operational status at the pilot intervention areas will be continuously collected by the ECF4CLIM IoT cloud for further processing.

2.- Links from and to other tasks (what/timing)

Based on the results of the pilot audits performed in WP4, QUE will perform early lab experiments with different IoT products available in the market in order to pre-validate their performance and approve them prior to their installation at the different pilot site typologies.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task leader: QUE Participants: SMARTWATT, CIEMAT, IST, USE, JYU, UAB, MEDARESEARCH

- Deliverable 7.11 ECF4CLIM IoT Platform v.1 (tested at QUE Lab premises) M12, September 2022
- Deliverable 7.12 ECF4CLIM IoT Platform v.2 (Final Version After Integration is completed and prior to roll out) - M24; September 2023

4.- Methodologies and data requirements (please consider who you are going to get the data from if not already available)

Based on the KPIs and the user requirements that have been specified in Task 7.3 in conjunction with the results from WP4, Task 7.4 will develop appropriate connections of all components to the IoT gateway through standardised communication protocols (e.g. ZigBee, Z-wave) and eventually propose a detailed bill of materials (BOM) and deployment topology for each pilot site, composed of proven IoT devices.

IoT Cloud will host specific services that will be developed for ECF4CLIM purposes in order to allow dynamic calculation and visual analytics services over KPI measurement at various spatio-temporal levels that can be extracted thought data post process. IoT Cloud will also expose application interfaces (APIs) to allow efficient exchange information along with all ECF4CLIM subsystems and the IoT platform. Health monitoring services will also be available in order to provide intuitive views and automated alerts on the quality of operations of the IoT infrastructures to the pilot site facility managers.

Within Task 7.4 and on top of the IoT solution appropriate mobiles app for building occupants and dashboards will be developed to facilitate user engagement.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc)

| Partner | Tasks | Role | PM |
|--------------|-------|--|-----|
| CIEMAT | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 0.5 |
| IST | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 1 |
| USE | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 0.5 |
| JYU | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 1 |
| UAB | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 1 |
| MedaResearch | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 2 |
| Smartwatt | 7.4 | Participant. Inputs to IoT Ecosystem for Multipurpose Monitoring | 6 |
| QUE | 7.4 | Task leader. IoT Ecosystem for Multipurpose Monitoring | 26 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable 7.11 ECF4CLIM IoT Platform v.1 (tested at QUE Lab premises) M12, September 2022; responsibility: QUE



- Deliverable 7.12 ECF4CLIM IoT Platform v.2 (Final Version After Integration is completed and prior to roll out) - M24, September 2023; responsibility: QUE

Task 7.5: Learning Space / Educational Resources for Responsible Citizenship in Climate Change Prevention and Sustainable Development.

1.- Revised description of the task

- The learning space will include several educational resources designed to improve citizens' awareness and capacity to act against climate change and towards sustainable development.
- These diverse educational resources will include Digital Learning Contents, and a section with links to related educational resources.
- The game will include digital learning contents and a number of minigames.
- Narratives, storytelling, and creative writing tasks will be integrated in the game.

2.- Links from and to other tasks (what/timing)

The development tools will be firstly applied, tested and validated at the demonstration sites (WP4, WP5 & WP6).

The task 7.5. is linked mainly with the WP3. Content development to different users of the educational communities will be created by ISQ and it will be based mainly on the results of task 3.2. and 3.3., the analysis of the relevant literature (regarding sustainability competences, competence development and education for sustainable development), national curricula in the project countries and existing policy frameworks.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task leader: ISQ Participants: SMARTWATT, TREBAG

The detailed workplan of the technical side of the game development (subcontractor):

Month 10-13:

- Design and development of framework and MySQL database connections, taking into account the recommendations of the W3C consortium
- Server parameterization
- Website structure design
- Database structure design

Month 13-14:

- Front-end and Back-end UI development
- The administration interface development
- Basic login interface development

- Design, implementation and application of the addictive graphics

Month 14-18:

- Development of the customised games of the Learning Space
- Design, implementation and application of the addictive graphics

Month 18:

- Design, implementation and application of the addictive graphics
- Development and integration of internationalization surface
- Designing the interface of the knowledge centers, creating the uploading interface

Month 19:

- Alpha version testing, bug fixes/corrections

Month 20:

- Application of cross browser theories
- Front-end and back-end optimisation

Month 21:

- Developing an environment that adapts to the narrative, and integration of the related uploading interface
- Chapter selector creation

Month 22-23:

- Registration, login, profile page development, UI extension
- Integration of Database Injection Protection and XSS Protection, protection of forms
- Beta version testing, bug fixes/corrections

Month 24:

- Front-end and back-end optimisation, testing, bug fixes/corrections. This timeline means that the game platform development should start in M8/M9/ or latest M10 of the project.

Workplan for the development of the learning content

Month 9-10: Selection of the learning outcomes to be addressed

Month 11-20: Development of learning contents for the customised games of the Learning Space

Month 21-24: Testing and fine tuning of learning contents

- Deliverable 7.13 ECF4CLIM Learning Game (gamification) - M24, September 2023, responsibility: Trebag
 - TREBAG will develop the digital game optimized only for computer (technical part, graphic design part, frame story) and will “gamify” the training material (creative writing, storytelling).
- Deliverable 7.14 ECF4CLIM Digital Interactive Learning Contents - M24, September 2023, responsibility: ISQ

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The possible types of the minigames include quizzes, decision trees, drag&drop, true or false questions and memory cards.

Narratives, storytelling, and creative writing tasks will be integrated in the game, as proven ways of motivating users to play the game and study the materials. Story elements, as part of gamification, indeed today occupy a vital role in today’s education and even professional training.

5.- Detailed **partners’ involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc)

| Partner | Tasks | Role | PM |
|-----------|-------|---|----|
| ISQ | 7.5 | Task Leader. Educational Resources for Responsible Citizenship in Climate Change Prevention and Sustainable Development | 35 |
| Trebag | 7.5 | Participant. ECF4CLIM Learning Game | 18 |
| Smartwatt | 7.5 | Participant. Inputs and support to partners | 6 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable 7.13 ECF4CLIM Learning Game (gamification) - M24, September 2023; responsibility: Trebag
- Deliverable 7.14 ECF4CLIM Digital Interactive Learning Contents - M24, September 2023; responsibility: ISQ

Task 7.6: Implementation, Test & Validation of the digital platform.

1.- Revised description of the task

The implementation will follow the next steps: web design, data storage architecture, coding, hosting, and dissemination. As a first step, an Application Programming Interface (API) will be developed, as a tool for connecting with the other WPs, and storing the outputs produced by them. Data architecture will be defined based on data available. Based on this definition of architecture, the most suitable technology will be selected.

Technology to support all dashboards visualisations will be defined according to web design rules.

2.- Links from and to other tasks (what/timing)

An Application Programming Interface (API) will be developed, as a tool for connecting with the other WPs, and storing the outputs produced by them.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

Task leader: SMARTWATT Participants: JYU, ISQ, QUE

- Deliverable 7.15 ECF4CLIM Digital Platform Integration/Validated - M24

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

As a first step, an Application Programming Interface (API) will be developed, as a tool for connecting with the other WPs, and storing the outputs produced by them. Data architecture will be defined based on data available. Based on this definition of architecture, the most suitable technology will be selected.

Technology to support all dashboards visualisations will be defined according to web design rules.

All the stakeholders will be involved in testing and validating the outputs provided. A software development environment will be created to allow the testing of every module developed in a pre-production environment before deploying it in the production environment.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|-----------|-------|---|----|
| JYU | 7.6 | Participant – Inputs and feedback regarding the Implementation, Test & Validation of the digital platform | 1 |
| ISQ | 7.6 | Participant - Support in the Implementation, Test & Validation of the digital platform | 10 |
| Smartwatt | 7.6 | Task leader - Implementation, Test & Validation of the digital platform | 10 |
| QUE | 7.6 | Participant - Support in the Implementation, Test & Validation of the digital platform | 10 |

6.- **Deliverables** (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable 7.15 ECF4CLIM Digital Platform Integration/Validated - M24, September, 2023; responsibility: Smartwatt

WP8

2.1.7 *Work Package 8: CLUSTERING, OUTREACH AND DISSEMINATION ACTIVITIES*

General information on the WP

The work package 8 is oriented to reach the following objectives:

(O1) To elaborate a Communication Plan that promotes the dissemination, visibility and impact of the project, nationally and internationally, while ensuring the internal cohesion of ECF4CLIM and an active engagement of the educational community.

(O2) To define a Transdisciplinary Dialogue Strategy that facilitates the exchange of expertise and information between the teams, disciplines, and experts involved in the development, testing, and validation of the ECF.

(O3) To produce a Plan for Exploitation of ECF4CLIM's Results and the Stimulation of Synergies (PERSS) with stakeholders, other relevant projects, initiatives, and network platforms that address the challenges and opportunities of educational actions for climate and sustainable development.

(O4) To develop a specific Clustering Activities Plan with other selected projects under this Call.

Task information:

Task 8.1: Communication Plan

1.- Revised description of the task

T8.1 Communication Plan. (Task leader: Meda Research)

A Communication Plan will be defined for ECF4CLIM project to guarantee a suitable dissemination strategy about the project, its objectives, approaches, methods, tools, and results to a wide range of target audiences (students, teachers, policymakers, media, general public, 'green' technology developers, textbook publishers, etc.). ECF4CLIM will further rely on "multipliers" such as journalists and civil society organizations, and participation in events to support communication and to reach the target audiences.

The Communication Plan will address both communication tools and dissemination activities and will promote the internal cohesion among partners (both consortium and associated partners) and support the active engagement of the educational community.

T8.1.1. Communication Tools (Task leader: Meda Research)

The key communication tools will be the following:

- (1) **website** - the ECF4CLIM project website will act as a central point for the communication activities, and will serve as the working space for the partners and also as repository for both the publicly available information and the produced documents,
- (2) **newsletters** – fast communication on the progress of the project to the target groups,
- (3) **social media** – dedicated accounts in social media such as Twitter, LinkedIn, Facebook, and Instagram will serve as effective communication channels with the school communities and as vectors for spreading information about project outputs and events; social media managers, selected among the students participating in the project, in each school will serve as central points to canalize the impact of the project activities among the students,
- (4) **communication materials**: project presentation, flyer, factsheets, short videos, podcasts, blogs, etc. will support off-line communication and enhance the visibility of the project especially at various events,
- (5) **press activities**: three press releases, translated into several languages, will be sent to selected journalists,
- (6) **events**: participation of partners in events, such as scientific conferences, strategic meetings of associations and platforms, at local, national, and international levels,
- (7) **logo**: a consistent use of the project logo and other distinctive key visual elements,
- (8) **advocacy**: bringing ECF4CLIM to the attention of a wider set of decision-makers beyond the contact persons directly involved in the project's work;
- (9) **digital platform**: developed in WP6, the digital platform will host a set of useful tools for climate action (planning, implementation, and evaluation), examples of good practices, and an interactive process to stimulate the participation of individuals and groups in on-going climate actions or to support the growing from idea to a real implementation.

The educational community will be actively engaged in the design and implementation of communication materials and strategies.

T8.1.2. Dissemination activities (Task leader: Meda Research; Participants: All)

For effective dissemination, ECF4CLIM project will focus on the following activities:

- (1) **academic articles** published in **peer-reviewed international journals** with high impact factor and using both gold and green open access,
- (2) **presentations** at international and national **scientific events**,
- (3) **ECF Workshops** with a broad representation of the potential users of the ECF. The first ECF workshop will be devoted to the presentation of the ECF4CLIM and the second, at the end of the project, will share the results and outputs, including the digital platform.
- (4) **ECF4CLIM Final Conference** involving, if possible, all the school communities participating in the project, representatives of the target groups, policymakers and implementers of the climate actions; to allow the participation of a maximum number of interested groups and individuals, the conference will be organized as a combined on-line and face-to-face event.
- (5) **Webinars**, in which students will have the opportunity to present and share the ECF testing and validation activities performed in their schools with the other schools participating in the project, as well as with other external audiences,
- (6) organizing of an **Award for the Best Implementation Activity** (two editions):
- (7) supporting the organizing of the **Sustainability Competences Committees** facilitating information materials.

For the majority of articles arising from the project, "gold" access in an open access peer reviewed journal would be procured. This would be combined with a free repository ("green" access) of all scientific articles arising from the project on the ECF4CLIM website.

The main events, such as the ECF workshops and the Final Conference, will be open to a large audience and invitations will be adequately disseminated.

Dissemination, targeted at wider publics, will take place e.g. through the publication and dissemination of key deliverables and project factsheets on the website, and participation in networks and initiatives organized by third parties.

2.- Links from and to other tasks (what/timing)

Internal communication will be ensured also taking into consideration of Task 2.3 (Communication within the consortium, internal meetings and progress reports). T8.1 (sub-task T8.1.1) offers the framework for the internal communications (procedures,

envisaged methods and means). By Communication Plan the general framework is transferred to T2.3, in charge for the internal communication process.

Also, T8.1 will offer periodic results (at least during project meetings and project reporting) about communication and dissemination activities to T2.1 (Coordination and administration of the project).

The dissemination activities (sub-task T8.1.2) will be based on the key results obtained in the tasks of WP3, WP4, WP5, WP6, and WP7. The following tasks are mainly expected to produce relevant results to be disseminated: T3.1 (Crowdsourcing), T3.3 (The development of an initial EFC), T3.4 (Expert analysis of the initial ECF), T3.5 (Internal and external validation of the ECF), T4.1 (Collective Competences for Sustainability), T4.2 (Individual Competences for Sustainability), T4.4 (Co-design of measures to promote competences, behaviours and social practices towards climate action and sustainable development), T5.1 (Behavioural Interventions), T5.2 (Structural/Environmental Interventions), T5.3 (Joint implementation: Participatory, reflective, and deliberative process to support the interventions), T6.1 (Evaluation of the collective competences: policies, measures & practices for climate action and sustainability), T6.2 (Evaluation of the individual competences), T6.4 (Participatory evaluation of the interventions), T6.5 (Proposals and recommendations on key components and requirements for the ECF and ways of improving social practices in education to promote climate action and sustainable development), T7.2 (Crowdsourcing collaborative space), T7.3 (Simulation tools), T7.4 (IoT Ecosystem for Multipurpose Monitoring), T7.5 (Learning Space / Educational Resources for Responsible Citizenship in Climate Change Prevention and Sustainable Development), T7.6 (Implementation, Test & Validation of the digital platform). The timing for these links is the timing established for the finalization of each of the tasks. If a partial result will be considered appropriate for the dissemination before the finalization of the task it will be performed conditioned by the respecting of the rules and procedures for the dissemination and exploitation of the project's results.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

For the communication activities the work plan is described below, per each planned activity:

- (1) The **website** is the responsibility of Meda Research. All partners will contribute. The deadline for the operational phase is January 2022, regular updates will be produced according with the timing described in the Communication Plan. The web design will be achieved by Meda Research, the partners will contribute with feedback on the design and contents and also with new contents.

- (2) The **newsletters** are the responsibility of Meda Research (design and production). All the WP leaders and Task leaders will contribute to the contents. At least four issues are planned (annually, with the releasing in April), additional issues, if appropriate, may be released in October, each year. The partners will contribute to the contents of the newsletters. Details are presented in the Communication Plan.
- (3) The **social media pages** will be coordinated by Meda Research in charge with the design and running of the project's social media pages (Facebook, LinkedIn, YouTube). For the national pages (Spain, Portugal, Finland, Romania) the responsibility is of the national team coordinator (1) CIEMAT for Spain, (2) IST for Portugal, (3) University of Jyväskylä for Finland, (4) MedaResearch for Romania). The responsible will ensure the moderation of the flux and will stimulate the audiences, especially the groups of children, students, educators and citizens to post, comments, share, and enlarge the communities. Details are presented in the Communication Plan.
- (4) The communication materials will be produced during the implementation. Some of them are the responsibility of the coordinator (CIEMAT) such as the project presentation, video of the project, the podcast, and the flyer. The blog will be coordinated by Meda Research. The factsheets are in responsibility of the work package leader originating the product, tool or very important activity to be promoted. Details on the planning are presented in the Communication Plan.
- (5) The **press activities** will be coordinated by CIEMAT. The content of each will be translated into several languages. All partners will contribute to the translation in the national languages and to the selection of the journalists in order to spread the information on the ECF4CLIM project. The tentative planning to release them is: first on month 18 (March 2023), second on month 30, and the last on month 42. The selection of the newspapers, magazines and journalists will be a decision of the Steering Committee.
- (6) The communication by using different **events** will be achieved by all the partners representing the project in those events. The communication will be performed under the rules established in the Communication Plan.
- (7) The logo is in the responsibility of Meda Research, with the deadline in November 2021. All the partners will be asked to introduce suggestions.
- (8) **Networking with Policy Makers** is the responsibility of the coordinator (CIEMAT). All partners will contribute by contacting national policymakers and communicate on the objectives, progress, and results of ECF4CLIM project.
- (9) The **digital platform** is in the responsibility of WP7 (coordinated by ISQ). The website, coordinated by MedaResearch, will introduce a page presentation and

the associated link to access the digital platform. The page presentation will be available on January 2022. The link to the digital platform will be introduced immediately after the releasing of the first module (Crowdsourcing collaborative space), planned for March 2022

For the dissemination activities the work plan is described below, per each planned activity:

- (1) **Publication of academic articles** is the responsibility of each partner. A supervision will be ensured by the work package leaders and by the Steering Committee according with the recommendations and procedures described in the Plan for the Dissemination. The publication will be achieved in short time after the finalization of the activities. All the important results and analysis will be oriented to peer-reviewed international journals with high impact factor and using both gold and green open access.
- (2) **Presentations** at international and national **scientific events** are the responsibility of each partner following the rules from the Plan for the Dissemination. The participation will be achieved to the most relevant events in order to optimize the use of the resources and obtain a high impact for the dissemination of the project and of the results.
- (3) The **ECF Workshops** will be organised by JYU as coordinator of the WP3 (Development of ECF for Climate Change and Sustainable Development). First ECF Workshop (the Outline of the ECF) is planned for September 2022, the second one (The results and outputs, including the digital platform performances) is planned for April 2025. Meda Research will support JYU in the planning of the workshops (format, agenda) together with CIEMAT as project's coordinator. All partners will be involved in these actions to present their results and outputs from the implementation of the ECF within the demonstration sites and also for the construction and functioning of the digital platform.
- (4) The **ECF4CLIM Final Conference** is the responsibility of Meda Research and CIEMAT. It will be organized in Spring 2025 in agreement with the evolution of the project and other concurrent events. All partners will participate and involved in the presentation of the most relevant results of the activities of the project. CIEMAT, IST, JYU, and Meda Research as national coordinator for the activities on the demonstration sites will be responsible with the inviting the school communities to participate in the final conference. All the partners will invite representatives of the target groups, policymakers and implementers of the climate actions.

- (5) The **webinars** will be organised by Meda Research and CIEMAT. First webinar is planned for M34 (July 2024), the second one for M38 (November 2024). Since the events will be centered on the exchange of experience and practices among the schools a special role will be plaid by the national coordinators for the demonstration sites (CIEMAT, IST, JYU, and Meda Research).
- (6) The **Award for the Best Implementation Activity** is to be integrated in the final conference event (spring 2025) and will be in the responsibility of Meda Research and CIEMAT. The national team coordinators for the intervention sites will contribute to the format and to the organizing of the event.
- (7) The production of the materials to support the **Sustainability Competence Committees** is the responsibility of Meda Research and CIEMAT. Specific timeline will be approached by the Plan for the Dissemination.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

The communication and dissemination activities will follow the recommendations and procedures described into the Communication Plan, respectively in the Plan for the Dissemination. Both Communication Plan and Plan for the Dissemination will be developed in agreement with the existing practices and recommendations for the European projects.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|-------------|----|
| CIEMAT | 8.1 | Participant | 1 |
| IST | 8.1 | Participant | 1 |
| USE | 8.1 | Participant | 1 |
| JYU | 8.1 | Participant | 1 |
| UAB | 8.1 | Participant | 1 |
| MedaResearch | 8.1 | Task leader | 4 |
| QUE | 8.1 | Participant | 1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable D8.1 Communication Plan (M3, December 2021) (responsible: MedaResearch)
- Deliverable D8.3 Plan for the Dissemination of ECF4CLIM results (M6, March 2022) (responsible: MedaResearch)
- Deliverable D8.6 Report on the communication and dissemination activities (M48, September 2025) (responsible: MedaResearch, reviewer: CIEMAT)

Task 8.2: Transdisciplinary Dialogue Strategy

1.- Revised description of the task

T8.2. Transdisciplinary Dialogue Strategy (Task leader. UAB)

The transdisciplinary dialogue is devoted to the exploration and unveiling of the manifold links among isolated issues of climate and sustainability actions.

A Transdisciplinary Dialogue Strategy (TDS) will be developed with the objective of producing fruitful reflections, discussion of the alternatives, revealing the interrelations among ECF's elements, and creating mutual support and synergies between a range of disciplines and fields of expertise (Physics, Geography, Ecology, Biology, Chemistry, Mathematics, Data management, etc) in a holistic approach.

Two webinars will be organised to discuss challenges and opportunities of transdisciplinarity, with the participation of experts from the ECF4CLIM partnership, representatives of the educational community (teachers and students), and all identified stakeholders (such as NGOs, local/national authorities).

The conclusions of the webinars will be the basis for the construction of the TDS. A set of recommendations for a transdisciplinary educational process will be included in the TDS, to facilitate the harmonious integration of different disciplines and types of expertise, including those beyond the academia.

The recommendations will be designed to create new knowledge, to stimulate the translation of knowledge into the day-to-day practices of the learners, and to foster efficient dissemination of new knowledge and practices in the involved communities and society at large

2.- Links from and to other tasks (what/timing)

A close link has to be achieved with the tasks devoted to the development of the ECF: T3.3 (The development of an initial EFC) and T3.4 (Expert analysis of the initial ECF), planned to be performed in the first year of the project. During these efforts an analysis will be performed to identify the transdisciplinary issues in order to build the TDS.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The participants in the ECF development process will be invited to participate into a reflection process, coordinated by UAB. This activity will be performed together with the T3.3 and T3.4. Based on the ECF's elements developed in the WP3, on the reflection and

discussion processes, the transdisciplinary needs will be identified. Also, the process will identify the synergies between a range of disciplines and fields of expertise (Physics, Geography, Ecology, Biology, Chemistry, Mathematics, Data management, Behavioural sciences, etc). A holistic approach will be proposed, by involving multiple disciplines, in order to cover the estimated needs to deliver the necessary knowledge to cover the interdisciplinary elements.

The Transdisciplinary Dialogue Strategy will be developed based on the identified needs, possible solutions, existing resources. A special attention will be paid to the new knowledge to be created, and also to the translation of knowledge into the day-to-day practices of the learners.

To facilitate the discussions and reflection process on the transdisciplinary, two webinars will be organized: first one on M13 (October 2022), the second one on M15 (December 2022). The conclusions of the webinars will be the basis for the construction of the TDS. The TDS will be finalized in M18 (March 2023).

4.- Methodologies and data requirements *(please consider who you are going to get the data from if not already available)*

The task will receive the ECF results, produced by WP3, as input elements for the discussion during the webinars. The methodology will use the hybrid format (face to face combined with on-line) in order to increase the number of the participants. TDS will be developed in agreement with the existing practices and recommendations for the European projects.

5.- Detailed **partners' involvement** /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|-------------|-----|
| CIEMAT | 8.2 | Participant | 2 |
| IST | 8.2 | Participant | 0.5 |
| USE | 8.2 | Participant | 0.5 |
| JYU | 8.2 | Participant | 0.5 |
| UAB | 8.2 | Task leader | 3 |
| MedaResearch | 8.2 | Participant | 1 |
| ISQ | 8.2 | Participant | 1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable D8.5 Transdisciplinary Dialogue Strategy (M18, March 2023)
(responsible: UAB)

Task 8.3: Exploitation of ECF4CLIM's Results and the Stimulation of Synergies Plan

1.- Revised description of the task

T8.3 Exploitation of ECF4CLIM's Results and the Stimulation of Synergies Plan (Task leader: Meda Research; Participants: All)

A key objective of WP7 is the exploitation of the research results, strengthening of the educational impact of the interventions and **creating effective synergies with other projects, initiatives, platforms and networks working on similar challenges** of education for action on climate change and sustainable development.

A "Plan for Exploitation of ECF4CLIM's Results and the Stimulation of Synergies" (PERSS) will be developed (M6). The plan will be built on two main pillars: the identification of key deliverables and results with a particularly high impact potential amongst the various audiences, and the selection of the most appropriate delivery targets in order to maximise the impact.

An expert from the consortium will be nominated – and approved by the Steering Committee (SC) – as responsible for coordinating all exploitation activities. The responsible will periodically report to the SC on the impact of the exploitation actions. Corrective measures will be proposed (e.g. adjusting the target audiences, refining the information materials, updating the collaboration plans) in accordance with the success criteria defined in PERSS.

A list of potential synergies, and a list of the potential projects for knowledge exchange, will be drawn up at the beginning of the ECF4CLIM project (M5). Amongst the on-going projects, the following have already been identified as having potential synergies with ECF4CLIM: ENGAGE, NAVIGATE, CASCADES, LOCOMOTION, RECEIPT, COACH, and CONSTRAIN.

The construction and validation of the ECF, together with the tools and methods hosted by the digital platform developed in WP6, will by themselves foster synergies. Information and knowledge on the digital platform, its performance and opportunities will create further opportunities for synergies.

A particular effort will be made to establish links and synergies with the activities and projects of educational associations and NGOs in the areas of environmental protection, climate change, and sustainable development, at both national and European levels.

2.- Links from and to other tasks (what/timing)

The exploitation activities will take into consideration the most valuable results obtained in the tasks of WP3, WP4, WP5, WP6, and WP7. The following tasks are mainly expected to produce relevant results to be exploited: T3.3 (The development of an initial EFC), T3.4 (Expert analysis of the initial ECF), T3.5 (Internal and external validation of the ECF), T4.1 (Collective Competences for Sustainability), T4.2 (Individual Competences for Sustainability), T4.4 (Co-design of measures to promote competences, behaviours and social practices towards climate action and sustainable development), T5.1 (Behavioural Interventions), T5.2 (Structural/Environmental Interventions), T5.3 (Joint implementation: Participatory, reflective, and deliberative process to support the interventions), T6.5 (Proposals and recommendations on key components and requirements for the ECF and ways of improving social practices in education to promote climate action and sustainable development), T7.2 (Crowdsourcing collaborative space), T7.3 (Simulation tools), T7.4 (IoT Ecosystem for Multipurpose Monitoring), T7.5 (Learning Space / Educational Resources for Responsible Citizenship in Climate Change Prevention and Sustainable Development), T7.6 (Implementation, Test & Validation of the digital platform).

The results having potential to be included in the PERSS will be identified by the work package leaders and task leaders and included immediately after identification on the list. After the approval of PERSS the SG will monitor the actions planned for the exploitation.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

At the beginning of the project the work package leaders and the task leaders will identify the potential results to be included in the list of exploitable results as a basis of the Plan for Exploitation of ECF4CLIM's Results and the Stimulation of Synergies" (PERSS). The action will be coordinated by Meda Research and CIEMAT. All partners will be consulted according with their planned involvement in the project to estimate the potential of their results for the exploitation activities.

PERSS will be released on M6 (March 2022) and Meda Research is in charge for it. Also, a list of potential synergies, list of the potential projects for knowledge exchange, will be produced. It is planned for M5 (February 2023) and it will be coordinated by Meda Research. PERSS will be discussed and approved by the first SC meeting (spring 2023).

An expert from the consortium will be selected, and approved by SC meeting (spring 2023) as responsible for coordinating all exploitation activities. The responsible will periodically report to the SC. Corrective measures will be proposed and also adaptation of PERSS.

The activity is planned for whole duration of the project. An approach for the implementation of the exploitation activities beyond the duration of the project will be established by PERSS.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

PERSS will be developed in agreement with the existing practices and recommendations for the European projects.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|-------------|-----|
| CIEMAT | 8.3 | Participant | 3 |
| IST | 8.3 | Participant | 0.5 |
| USE | 8.3 | Participant | 0.5 |
| JYU | 8.3 | Participant | 0.5 |
| UAB | 8.3 | Participant | 0.5 |
| MedaResearch | 8.3 | Task leader | 3 |
| ISQ | 8.3 | Participant | 0.5 |
| Trebag | 8.3 | Participant | 0.5 |
| Smartwatt | 8.3 | Participant | 0.5 |
| QUE | 8.3 | Participant | 1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any)

- Deliverable D8.4 Plan for the Exploitation of ECF4CLIM Results and for Stimulating Synergies (M6, March 2022) (responsible: MedaResearch)
- Deliverable D8.7 Report on the synergies with other projects and on the exploitation of the results (M46, July 2025) (responsible: MedaResearch)

Task 8.4: Clustering Activities Plan.

1.- Revised description of the task

T8.4. Clustering Activities Plan (Task leader. CIEMAT)

This task is dedicated to liaison and coordination with other projects funded under this call, and which work towards developing an ECF for climate change and sustainable development. A series of periodic meetings and joint activities will be organised. A detailed plan for these clustering activities will be developed during the first months of the project (M3).

The task also includes efforts to communicate, invite and stimulate the educational communities and other stakeholders to participate in climate action and build a greener Europe in the framework of the Climate Pact. The envisaged activities will be included in the Clustering Plan (M3) and regularly updated over the course of the project. Information concerning the environmental interventions implemented in WP4 and evaluated in WP5 will be communicated to the other participants on Climate Pact activities in order to spread knowledge and awareness and collectively develop and implement climate solutions.

The activities of the ECF4CLIM project are fully in line with all four areas (Green areas, Green transport, Green buildings and Green skills) of the Climate Pact. ECF4CLIM project will pursue action in all four areas, by encouraging the participating educational establishments to become Climate Pact Ambassadors, make pledges of the climate-friendly actions implemented, or register in ECF4CLIM events.

2.- Links from and to other tasks (what/timing)

The task will be linked with T 2.1 (Coordination and administration of the project) in terms of the planning of the meetings and activities with other projects.

3.- Detailed work plan (what/who will participate/when/how (*)/responsible partner)

The activities will be coordinated by CIEMAT. Four partners (IST, USE, JYU, UAB) will contribute to the implementation of the activities. A Clustering Plan will be developed in M3 (December 2021) by identification of the projects with potential for information and results exchanges. Based on the Clustering Plan a set of activities will be implemented during the whole duration of the project. Some activities may be attributed to the responsibility of other partners then CIEMAT in agreement with the developed Clustering Plan.

4.- Methodologies and data requirements (*please consider who you are going to get the data from if not already available*)

The construction of the Clustering Plan will take into consideration the current practice of the European projects.

5.- Detailed partners' involvement /role/responsibilities (Name, responsibilities, PM, timing, etc.)

| Partner | Tasks | Role | PM |
|--------------|-------|-------------|-----|
| CIEMAT | 8.4 | Task leader | 3 |
| IST | 8.4 | Participant | 0.5 |
| USE | 8.4 | Participant | 0.5 |
| JYU | 8.4 | Participant | 1 |
| UAB | 8.4 | Participant | 0.5 |
| MedaResearch | 8.4 | Participant | 1 |
| ISQ | 8.4 | Participant | 0.5 |
| TREBAG | 8.4 | Participant | 0.5 |
| SMARTWATT | 8.4 | Participant | 0.5 |
| QUE | 8.4 | Participant | 1 |

6.- Deliverables (include brief description, format, timing, contributing and responsible partner, and proposed reviewer (if any))

- Deliverable D8.2 Clustering Plan (M3, December 2021) (responsible: CIEMAT)
- Deliverable D8.8 Report on clustering activities and participation of the educational communities in the European Climate Pact (M48, September 2025) (responsible: CIEMAT)
- D8.9 Reporting on clustering activities (M18)