ACCREU

Assessing Climate Change Risk in Europe

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Changes with respect to the DoA

The deliverable follows the Description of Work.

Dissemination and uptake

This deliverable reports on the activities undertaken in the bounded co-creation activities across the ACCREU project, and the formulation of research questions, outputs, and outreach with broad and deep engagement stakeholders.

Short Summary of results

The ACCREU project is centred on a co-creation approach that goes beyond stakeholder consultation and seeks to actively engage stakeholders in the design and delivery of research activities of the project. It is delivering bounded, instrumental co-creation to deliver useful information for policy makers using a brokered process. This enables science-practice-policy interactions, through joint working and knowledge production to provide policy relevant material.

For the bounded co-creation a protocol was developed around three steps. This deliverable provides the progress and achievements for each of these steps.

During the co-design process and the first Stakeholder Workshop, the discussion with stakeholders identified 227 research questions. These insights were used to adapt and shape the project activities and the team conducted research on 158 of the questions that were prioritised in the co-design stage.

During the co-production process, the ACCREE project held 117 stakeholder meetings and events (with international and national policy makers and authorities, regional and local policy makers, business and industry, NGOs and citizens and the research community) directly reaching 1243 stakeholders. The 7 Adaptation Decision Type Case studies were co-produced with deep engagement stakeholders leading to results that were closely aligned to end-user needs. The ADT findings have been used by stakeholders in policy documents, guidance and perspective shifts.

As the project goes into the final stage, the co-delivery activities have started and activities are underway for developing and delivering these activities with stakeholders.

Evidence of accomplishment

The evidence on research activities covered and meetings held with stakeholders provide evidence that the co-creation activities have delivered against the project ambitions. A monitoring and evaluation process (D1.6) will be completed at the end of the project to assess how successful the overall activities have been and learn lessons.

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Summary

A key focus of the ACCREU project is to ensure that outputs are relevant and can contribute to evidence-based policy analysis and decisions. To ensure this, the project is centred on a co-creation approach that goes beyond stakeholder consultation and seeks to actively engage stakeholders in design and research activities.

ACCREU is delivering two forms of co-creation, with different objectives. The first is the bounded instrumental co-creation to deliver useful information for policy makers using a brokered process. The second is emergent (critical/reflexive) co-creation which aims to develop new ways of thinking and

The bounded co-creation is the focus of this deliverable (D1.4), while emergent co-creation is addressed in D1.5.

For the bounded co-creation, a protocol was developed around three steps and the project has delivered in line with the description of work:

- The co-design stage, in which the research team jointly developed research questions and identified common interest with stakeholder partners. During the co-design process and at the kick-off Workshop, the discussion with stakeholders identified 227 research questions. The project used these to alter the research activities and worked on 158 research questions during duration of project.
- The co-production stage, in which the team worked with stakeholders to deliver this research, working together on chosen case studies or policy decisions with a set of deep engagement stakeholders. During the co-production process, the ACCREU project held 117 stakeholder meetings and events (with international and national policy makers and authorities, regional and local policy makers, business and industry, NGOs and citizens and the research community) directly reaching 1243 stakeholders. The 7 Adaptation Decision Type Case studies were each undertaken with deep engagement stakeholders. The ADT findings have been used by stakeholders in documents, guidance and perspective shifts.
- The co-delivery stage, where the strategies to communicate project results were developed and delivered with stakeholders. As the project goes into the final stage, the co-delivery activities have started and activities are underway for developing and delivering with stakeholders.

1. Research framework and objectives

This deliverable reports on the bounded co-creation activities in the ACCREU project. This is the main objective of Task 1.4 of Work Package 1, see task description below.

Task 1.4, Bounded co-creation for adaptation research: research questions, scenarios, outputs, and outreach [M1-35] (Lead: PWA, ECOLOGIC, Participants: ALL PARTNERS see D1.4 and Milestone 1.3) will deliver the co-design and co-production of the adaptation case studies with deep engagement stakeholders (WP3, T3.2 and T3.3). Each Adaptation Decision Type will apply the co-creation protocol to develop a participatory process. This will include an initial meeting for each case study area (Phase 1 - co-design) to identify research questions and needs of relevant decision makers and ensure that the adaptation assessments have a high practical and policy relevance. Subsequently, this task will guide the co-production process for WP3 to ensure joint knowledge production from the adaptation case studies. Additionally, this will include at least two bi-lateral meetings for each case study to support co-production and co-delivery of products (Phase 2 Co-production and Phase 3 co-delivery). Furthermore, one exchange workshop per Adaptation Decision Type is planned involving deep engagement stakeholders and topic specific additional generic stakeholders for each Adaptation Decision Type.

The objectives of the co-creation protocol are related to a number of key ACCREU goals, notably:

O1: Co-deliver a **comprehensive, integrated, updated and co-designed assessment** of climate risks across sectors, countries, sub-national regions under different climate and socio-economic scenarios while considering distributional consequences across households and business types, fiscal and financial implications.

O3: Co-create ready-to-implement Adaptation Decision procedures and strategies together with public and private actors to address decision makers at multiple level of governance.

Definitions

Co-design (cooperative design) is the participatory design of a research project with stakeholders (users of the research). The aim is to jointly develop and define research questions that meet collective interests and needs.

Co-production is the participatory development and implementation of a research project with stakeholders. This is also sometimes called joint knowledge production.

Co-delivery is the participatory design and implementation for the appropriate use of the research, including the joint delivery of research outputs and exploitation of results.

2. ACCREU Co-creation approach

A key focus of the ACCREU project is to ensure the outputs are relevant and can contribute to evidence-based policy analysis and decisions. To ensure this, the project is centred on a **co-creation** approach. **Co-creation is a structured science-practice interaction,** focused on joint working and knowledge production that informs policy and decision-making processes.[1]

The co-creation approach aims to provide accessible, transparent and usable knowledge to relevant stakeholders. It uses a research process which involves proactive and participatory involvement of key societal actors from policy making at different levels of governance, as well as the private sector and civil society. These stakeholders contribute by helping to define the project research priorities, participating in collaborative case studies, and orientating its communication and dissemination strategy.

There are different steps in the co-creation process, with three key phases (see Figure 1) embedded within a wider process that includes monitoring and evaluation.

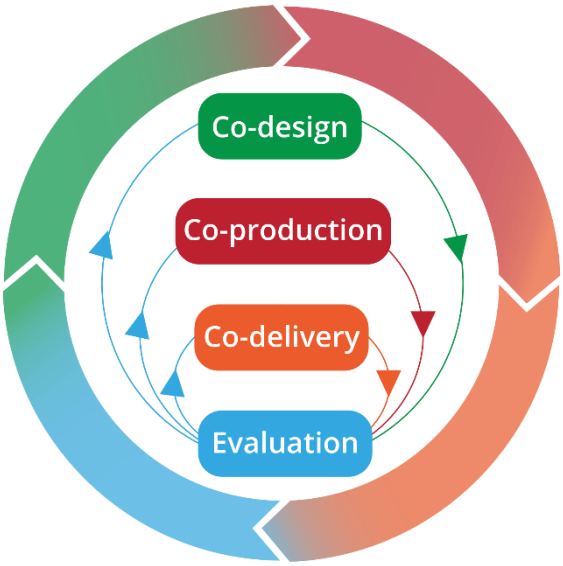

Figure 1 The overall co-creation process and steps.

Co-design is the first phase of the co-creation process, in which researchers and stakeholder partners jointly develop a research project and define research questions that meet their common interests and needs. This involves a range of co-design activities to ensure that the project outputs are relevant, acceptable and contribute to evidence-based policy analysis and decision making. It identifies the stakeholders that will be asked to co-design the project, from key government partners, private sector and civil society actors, and then proactively involve these stakeholders in co-design meetings to understand needs.

Co-design is followed by **co-production**, in which the research programme is advanced together with these stakeholders, for example by working together on chosen case studies or policy decisions. This was taken forward in WP3.

The final stage, **co-delivery**, is where the strategies to communicate and disseminate project results are developed and delivered with stakeholders.

This is undertaken within an iterative process **monitoring, evaluations and reflections**, so that lessons can constantly emerge and be incorporated at each research stage.

[1] McGlade, K., Tröltzsch, J., Tarpey, J. and Watkiss, P. (2022). Co-creating Research: Best- Practice Guidelines. Insights from the Horizon 2020 EU project COACCH. Available at https://www.coacch.eu/wp-content/uploads/2018/03/2811-COACCH-Co-creation- guideline-web.pdf

The ACCREU project developed a co-creation protocol to delivery these three phases, based on the findings from COACCH (Co-creating Research: Best-Practice Guidelines) and a wider review of the literature. This is set out in detail in **Deliverable 1.2**.

This protocol sets out the specific steps for co-creation in the project, as well as principles on engaging and maintaining relationships with stakeholders to maximize the impact of the research. This protocol is focused on the utilitarian, brokered co-creation process to generate usable information for decision makers. A different protocol was used for the critical/reflexive co-creation (see D1.2 and results in D1.5). The protocol breaks down the overall process into five steps, as in Figure 2.

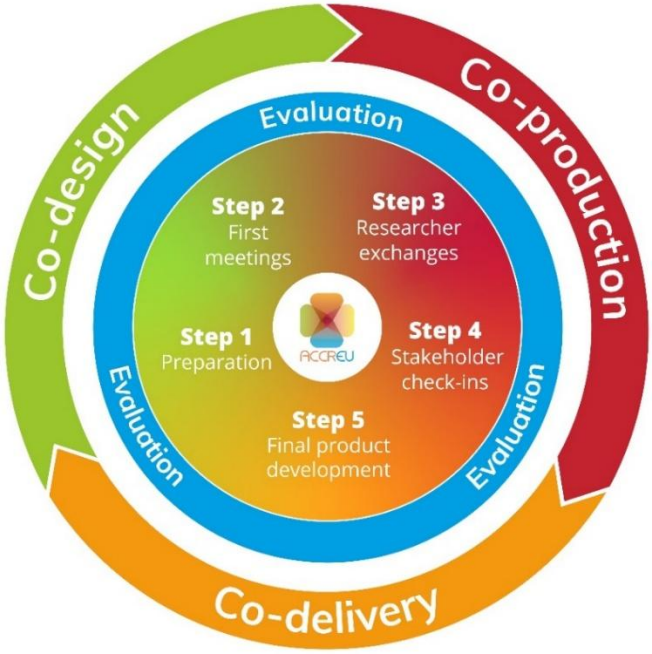

Figure 2 Overview of co-creation process for ACCREU.

3. Co-design Phase

In this phase, relevant stakeholders were identified and approached to assess their potential interests in the project and the co-creation process. The first step involved analysing the goals and needs of the project and identifying a group of stakeholders for the project on this basis. Two different types of stakeholders were identified: 1) general and 2) deep engagement stakeholders.

The general group were stakeholders who might be broadly interested in the activities of the project and its results, including the information from WP2 on sectoral economic costs and adaptation, and from WP4 on macroeconomic and global economic analysis.

The purpose of the deep engagement stakeholders was to engage more closely in the process of co-production through case studies. These deep engagement actors were therefore organizations that would be interested in, and directly participate, in the design of case studies. This was linked to the Adaptation Decision Types (ADT) in WP3.

The list of stakeholders was maintained in a database to coordinate and monitor communication and interaction, though is not shared in this deliverable to respect data protection laws. For all stakeholders a 'relationship manager' from the consortium was assigned, based on networks or known contacts. Deep engagement stakeholder organisations were approached with a letter of engagement with a semi-formal agreement to participate in the project. The letters set out project objectives, benefits of participating as a stakeholder, but also what would be expected (in terms of their time and inputs).

Prior to the first workshop (see Figure 2, step 1), a state-of the art review was undertaken (Deliverable 1.1). This provided information on current research on the economics of climate change and adaptation, and

identified research gaps. This was also condensed into a short technical policy brief (Policy brief 1, under 5.2), shared in advance, to assist the discussion at the workshop. It is noted that as the workshop had discussion at the sectoral level, the policy brief had 1 page on each sector, to enable sufficient discussion.

This information was discussed at a first Stakeholder Workshop in January 2024 in Brussels (see Milestone 1). **The focus of the workshop was to develop priorities for WP2(European) and WP4 (macroeconomic and global),** though it also invited and developed the case studies for WP3.

Based on previous experience in the COACCH project and on the literature review carried out for ACCREU, it was decided that the first stakeholder meeting should be held in-person only. This was considered necessary to build relationships and allow appropriate time and space for discussion. At the workshop, the process and goals for the project were set out. The results of the stock-take were then discussed with participants.

The workshop was informed by a 'bounded approach' to co-creation, meaning that while discussions were open and participatory, the frame of reference was to some extent bounded within the description of work and research agenda approved for the project.

The results of the Stocktake and research gaps were analysed in a participatory way to identify preferences for proposed research questions, with prioritization undertaken by stakeholders, as well as allowing stakeholders to add additional areas of interest. The discussed research questions were categorised according to their sectoral orientation, as well as their focus on impacts of adaptation. Questions that were highlighted as a particular stakeholder priority were noted as such. Scenarios and time periods to be used were also discussed at the workshop to understand stakeholder preference for how results should be presented.

The workshop gave the opportunity for stakeholders to identify pathways to impact noting areas where the research could feed into policies, strategies or plans and end-user decisions. This was supported by ideas for joint knowledge products (outputs such as policy briefs) which could be developed with or for stakeholders. Stakeholder views on the workshop and the co-design process were gathered through a formal evaluation at the end of the workshop and fed into the design of activities.

During the stakeholder workshop a total of 227 research questions were gathered (112 research questions suggested by the team, and additional 115 suggestions by stakeholders). These questions included research questions for WP2, on impacts and adaptation in Europe, WP4 on macroeconomic and global analysis, as well as some specific issues that could be taken forward in the WP3 case studies.

Shortly after the first Stakeholder Workshop, the research team had a consortium ACCREU project meeting in February 2024 in Laxenburg to consider the results of the co-design activities and to translate stakeholder interests and needs into a work programme for the project.

The research teams assessed all proposed 227 research questions according to the following questions:

- Will this research question be implemented in ACCREU? (Yes/No/Maybe)
- Which partner(s) will cover this question?
- Any additional notes.

Researchers responsible for the different sectors were presented with tables outlining the research questions as well as options, and discussed each one and provided their responses in written form directly on the sheets. The results are shown in Figure 3.

The research team agreed to attempt to cover 105 of the discussed research questions, with a further 71 of the research questions still requiring further consideration and 51 not being able to be covered.

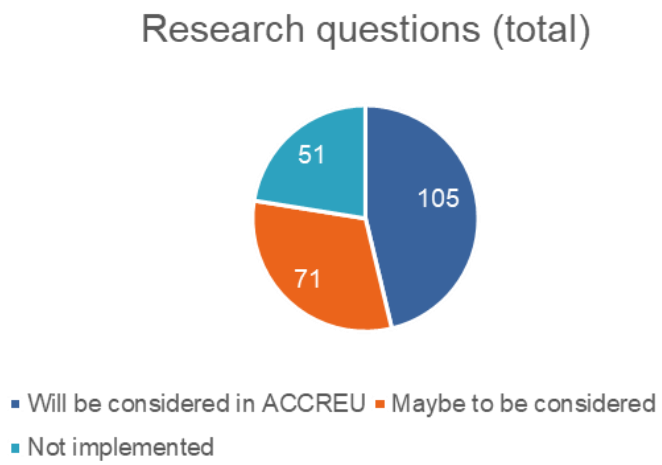

Figure 3 ACCREU research questions

The main reasons why questions could not be considered were that appropriate methods and models were not available within the project or in general; that the assessment would be too resource and time intensive for ACCREU; or that the research questions were considered in other projects and that the questions are beyond the topic-wise scope of project. Deliverable 1.3 (Report on research agenda) summarises the agreed research priorities.

4. Co-production Phase

The agreed ACCREU research programme was delivered in different strands of the project; depending on whether they were 'science first' or 'policy first' questions (see Deliverable 3.1). Many of the 'science first' co-designed research questions were addressed through the modelling activities in WP2 on sectoral climate impacts and adaptation and in WP4 covering the assessment at the macroeconomic scale, and covered the research questions set out above

Meanwhile, detailed engagement work in the case studies and their seven '**Adaptation Decision Types'** (ADTs) in WP3 (and detailed in D3.1) (see Figure 4) addressed co-designed research questions focused on 'policy first' questions. These were focused on the deep engagement stakeholders.

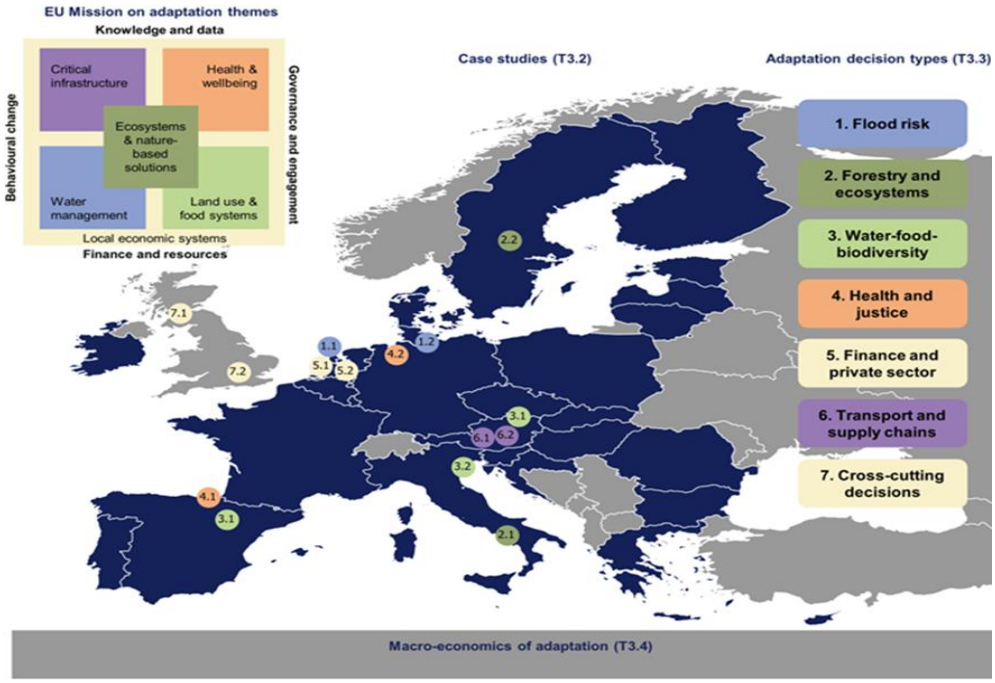

Figure 4 Case studies, adaptation decision types (ADTs) aligned to themes in EU Mission on Adaptation

Fifteen separate case studies were developed with deep engagement Stakeholders. These are documented in Table 1 below. Each of these sought to provide decision-relevant insights for stakeholders at local, national, sectoral and European levels (see **Deliverable 3.2)**, with an additional international case study reported on in **Deliverable 3.4**.

Table 1 Case studies and stakeholder partners.

ADT	#	Description
1	1.1	Title: Sub-national adaption investments for coastal floods. Partner: Deltares Users: Province North Holland, Water Board Hollands Noorder-Kwartier Spatial scale: Local Location: Den Helder, the Netherlands
	1.2	Title: Large scale and long-term coastal nature-based solution policies for rural regions in Europe and the German Baltic coast Partner: GCF Users: WWF Germany; IUCN; German coastal protection authority for state of Schleswig-Holstein Spatial scale: European Location: German Baltic sea coast; Europe
2	2.1	Title: Multi-sectoral adaptation to wildfire risk in a densely populated region with high natural values Partner: DTU Users: STRESS S.c.a.r.l. ; Campania region including transport authorities; municipality of Sorrento Spatial scale: regional Location: Campania region, Italy
	2.2	Title: Adaptation options for reduction of forest fire Partner: DTU Users: Miljö och Skog i Leksand Aktiebolag Spatial scale: Local Location: Leksand, Sweden
3	3.1	Title: Integrated adaptation decisions in managing the water-food nexus in Europe, Spain and Czech Thaya river catchment Partner: IIASA Users: Ministry of Agriculture (Czech Republic); Ebro River Basin Authority (Spain) Spatial scale: River basin scale Location: Ebro river (Spain), Thaya river (Czech Republic)
	3.2	Title: Integrated species distribution model for estimating potential economic impacts of conservation and impact mitigation preservations Partner: CMCC Users: WF Italy Spatial scale: Local Location: Venice lagoon, Italy
4	4.1	Title: Adaptation policy assessment, focus on health and distributional aspects Partner: BC3/Ecologic Users: Basque Government Environment Ministry Spatial scale: Regional Location: Basque region
	4.2	Title: Qualitative assessment of social justice dimensions of climate policy Partner: Ecologic/BC3 Users: Federal State of Bremen, Department Adaptation to Climate Change Spatial scale: Regional/Local Location: Bremen
5	5.1	Title: Adaptation options for enhancing financial stability Partner: Deltares Users: Dutch Central Bank Spatial scale: National Location: the Netherlands

	5.2	Title: Stimulation of private sector adaptation through insurance arrangements Partner: VU Users: Dutch association of insurers Spatial scale: National Location: The Netherlands
6	6.1	Title: Adaptation to minimize the risk of disruptions of trade corridors Partner: Deltares, UniGraz Users: Austrian Federal ministry for Agriculture and Forestry, Climate and Environmental Protection, Regions and Water Management Spatial scale: National Location: Austria
	6.2	Title: Reduction of critical raw material supply chain risks for the photovoltaics industry Partner: UniGraz Users: Fronius & AT&S Spatial scale: National/sector Location: Austria
7	7.1	Title: Costs and benefits of national adaptation programmes Partner: PWA Users: UK HMT; OBR; Defra Spatial scale: National Location: United Kingdom
	7.2	Title: Implications of adaptation for the Government budgets Partner: PWA, UniGraz Users: UK HMT; OBR; DEFRA Spatial scale: National Location: United Kingdom
	7.3	Title: Cross-sectoral economic analysis for adaptation Partner: CyI Users: Ministry of Agriculture, Rural Development and Environment of Cyprus; Ministry of Finance of Cyprus Spatial scale: National Location: Cyprus
	Int (D3.4)	Title: Adaptation Finance Gap Partner: PWA Users: United Nations Environment Programme Location: Global

In WP3, relationship managers and the research teams worked closely with deep engagement stakeholders in an iterative and collaborative process to develop these case studies. Initial face-to-face bilateral meetings were held in each case to define specific stakeholder interests and needs and to match these with research interests, agreeing on a plan to co-produce the case study research within the boundaries and work plan of the project.

Over the main phase of research, relationship managers met regularly (at least every 6 months) with their deep-engagement stakeholders to share interim results and discuss any challenges such as access to data. At these meetings (of which there were a minimum of three per ADT), opportunity was given for example for stakeholders to share policy-relevant developments and researchers to clarify questions arising from the research.

Overall, as part of this intensive case study work, and also capturing the engagement with WP2 and WP4 general stakeholders, ACCREU held **117 stakeholder meetings** and events (to April 2026). These interactions were tracked using the dissemination tracker and can be summarised as follows: international and national policy makers and authorities (n=34); regional and local policy makers (n=24); meetings with business and industry (n=15); meetings with NGOs and citizens (n=30); meetings with the research community (n=14).

This far exceeds the anticipated number of meetings outlined in the DoA (which included one initial, and two bi-lateral meetings for each case study, which would be 21 meetings).

Seven virtual ADT workshops were also held, one for each ADT (see also below). At these workshops, the deep-engagement stakeholders and relationship managers were joined by a wider group of stakeholders from the sector or region with an interest in the topic.

In total, ACCREU stakeholder events led to direct interactions with **1243 stakeholders**.

Annual surveys with the consortium were used to catch any problems in stakeholder collaboration. At project meetings, progress and stumbling blocks were discussed by the consortium as a whole and allowed the project team to troubleshoot any issues being encountered with stakeholder engagement.

ADT workshops

The seven ADT workshops were held approximately at the mid-point of the project, and provided an opportunity to reflect on the research conducted so far and to share information about the challenges, barriers and enabling factors for each ADT. An overview of the workshops is presented in chronological order in **Table 2** with brief summaries in the following section. A fuller account of the ADT workshops can be found in Milestone 3.

Table 2 Overview of ADT workshops

ADT Workshop on "Strategies and Barriers to Climate Change Adaptation for Food-Water-Biodiversity for Human-Nature Systems in Europe"	13/03/2025 Online (29 participants)
ADT Workshop on "Flood Risk, Financial Stability, and Flood Insurance"	20/03/2025 Hybrid workshop (17 participants)
ADT virtual workshop "Transformative coastal flood adaptation in Europe: barriers and success stories"	14/04/2025 Online (23 participants)
ADT Workshop on "Innovating with Wildfire Risk Management - A New Strategy for Europe"	20-21/05/2025 In presence ADT workshop integrated into the Third Wildfire Risk Management Clustering Event, main organizer = FIRELOGUE project, ACCREU was contributor, > 100 participants
ADT Workshop on "Climate risk and adaptation strategies for supply chains and transport infrastructure"	02/07/2025, Online (29 participants)
ADT Workshop on "Heat Resilient European Regions"	15/09/2025 Online (19 participants)
ADT Workshop on "ACCREU Workshop on Costing and Economic Analysis of National Adaptation Strategies"	26/09/2025 Online (39 participants)

ADT workshop summaries

A short summary of the workshops is included below. Full details are given in Milestone 3.

ADT 1

Due to sea-level rise and coastal flood risks, there is a need for coastal adaptation in Europe. The four archetypical strategies for coastal adaptation were introduced to participants: 1) protect; 2) accommodate; 3) retreat; 4) advance. The first three of these archetypes was discussed in greater depth through case studies. With stakeholders, the team subsequently discussed the presented case studies and whether participants knew of other innovative or transformative case studies in Europe related to coastal flood adaptation. Based on this discussion more information on case studies from other European projects (e.g. Rest-Coast) as well as practical examples were gathered. The list of barriers and success factors identified by the team based on the literature was discussed with stakeholders noting the importance of ensuring a good business case, but that there are other success factors that are of relevance, such as knowledge generation or monitoring.

ADT 2

Fires are growing in intensity, frequency, and unpredictability. The workshop highlighted the need for an integrated, landscape-based wildfire risk management strategy that is tailored to Europe's diverse ecosystems. Forests that have been simplified into monocultures for economic gain have become more vulnerable to large-scale fires. Instead, restoring natural ecosystems, promoting biodiversity, and aligning forest management with climate resilience must become central to the continent's approach. Effective wildfire risk assessment depends on access to high-quality, comprehensive data from diverse sources and better integration of climate science, land-use planning, and real-time monitoring is essential. The discussion underscored the critical need for shared responsibilities, collaborative efforts, clearer communication to build strong partnerships between governments, researchers, and local communities. Participants highlighted the need for continuous investment in innovative solutions and capacity building to ensure the lasting effectiveness of wildfire risk management strategies throughout Europe. The workshop also called for improved financial tracking systems, such as public expenditure reviews, to ensure that funding supports the most impactful actions across prevention, preparedness, response, and recovery. A promising new approach to financing fire management involves creating carbon pricing mechanisms that account for the increased risk in fire-prone regions. Looking ahead, Europe must move from reactive firefighting to proactive, with adaptation strategies that integrate science, technology, and local knowledge and account for the interconnected effects of climate change and evolving land-use patterns.

ADT 3

Stakeholders came together to discuss adaptation challenges in three locations: the Ebro river basin in Spain; the Thaya river basin in the Czech Republic and the Venetian OASI Alberoni protected area. Challenges in the first two locations include declining water availability, which barely satisfies the increasing water demand from households, industry, energy production, agriculture and biodiversity. Increased water demand is expected from agriculture to mitigate the effects of climate change. In the OASI Alberoni protected area, challenges are linked to sea level rise and changes in patterns of extreme events, overlapping with anthropogenic pressures and pressures from invasive species, all of which threaten dune habitats and functionality. The workshop discussed financial instruments including the recent EU Green Bond standard, green lendings, and voluntary Public-Private Partnership (PPP). Another strand of exchange concerned governance solutions such as farmers in Sweden who have partially transferred land usage rights to an association to manage river restoration, creating new wetlands and multifunctional reservoirs for irrigation increasing their resilience to floods and droughts. Stakeholders in Alberoni reported the problems of favouring tourism and property development over conservation and the need to raise awareness about fragile dune ecosystems. The benefits of these different governance models need to be well communicated to decision-makers and citizens, considering general preferences for short-term benefits and income generation with Payments for Ecosystem Service (PES) proposed as a potential scheme to estimate and communicate cost avoidance associated with climate change impacts and extreme events.

ADT 4

Heat impacts on health are growing in European regions, with impacts unequally spread across the population. There is a challenge that if differential vulnerabilities and risks are not explicitly addressed, heat-health adaptation strategies may exacerbate inequalities. The discussions showed that the development of adaptation strategies such as Heat Action Plans involves considerable coordination, with responsibilities often split across several departments and dozens of actors. However, when there is clear leadership for the process, these plans are generally manageable. At the same time, implementation remains challenging—particularly in reaching vulnerable populations and financing Nature-Based Solutions (NBS). Participants from Bremen and the Basque Country emphasised that short-term project funding and increasing maintenance costs of green infrastructure are major barriers. These practical constraints are compounded by competing priorities such as education and infrastructural needs. Connecting to supportive stakeholders and making use of existing structures for reaching particular target groups rather than creating new ones was identified as an enabling factor. Furthermore, monitoring benefits of interventions to produce quantitative data, and raising political awareness through direct engagement with decision-makers can increase support and effectiveness of Heat Action Plans.

ADT 5

The goal of the workshop was to stimulate discussion among stakeholders and identify practical, transferable approaches for strengthening adaptive capacity in the financial and insurance sectors. The group discussed examples of climate-finance stress tests within Europe outside of the Netherlands. Reference was made to studies by the insurance sector (e.g., EIOPA), the Financial Stability Board, and several central banks, for example the Bank of England, Bank of Canada, Deutsche Bundesbank, and others, who all conducted climate stress tests focusing on physical and transition risk, Subsequently, the discussion indicated that many frameworks show various transmission channels for the impact of climate risk on financial stability. However, the magnitude of the impact remains unclear. Further research can provide priority of transmission channels and in turn inform adaptation options. Several financial and insurance adaptation options were presented and discussed in detail, including: a climate label, the securitisation of at-risk loans (making risk tradeable); differentiated pricing or lending standards based on climate risk; capital climate buffers; and mandatory portfolio diversification

ADT 6

The workshop focused on road and rail infrastructure in Austria as well as supply chain resilience in the electronics sector. After a general discussion, two group discussions were formed. The transport infrastructure group discussed how current approaches to adaptation were seen as more reactive and incremental in nature, but that some country examples showed how large scale events leading to significant damages could lead policymakers to shift from this stance to a more aggressive, transformative approach. However, two limitations to broadening adaptation in this way were identified. Firstly, there is significant uncertainty surrounding future potential damages, with a lack of high-resolution analysis of vulnerable areas and risk hotspots. Secondly, while long-term investment may be cost saving over time, the limited amount of funding provided in government budgets is a major blockage. The supply chains group discussed how climate risk management and proactive adaptation planning could be integrated in existing management strategies or would need to be diversified. Barriers to transformational adaptation are the uncertainties associated with such options and the identification of climate risk at the company level, especially because it is not clear how to incorporate climate data into conventional investment decision-making. Larger companies with more resources are better situated to plan and implement transformational adaptation and can be supported with e.g. ISO certification requirements.

ADT 7

The topic of assessing costs and benefits of national adaptation programmes is an evolving research field. Presentations from UK, Cyprus, France and Germany highlighted similarities and differences between different costing approaches as well as peculiarities of national budgets arising from different levels of privatization and fragmentation of state budgeting. For instance, in France adaptation costs accrue primarily at the national level due to the high degree of centralization, while in Germany a considerable share of adaptation costs arises on a federal state level. Participants discussed the classification of adaptation costs that do not have adaptation as the main objective, but consider climate change in their implementation or exhibit adaptation services as a co-benefit. Many measures, such as subsidies for road renovation, civil protection and expenditures that give co-benefits in adaptation, take climate change into account but it is difficult to dissect the adaptation cost share. The workshop continued with a discussion of the macroeconomic and fiscal effects of adaptation, looking at selected impact chains in Spain, Austria and the Netherlands, and additionally, of different financing strategies (spending shifts versus bond financing) in the United Kingdom. The workshop successfully started a discussion on mainstreaming adaptation costs in national adaptation plans, and added to the common understanding of different costing approaches and importance of precise communication to policymakers

Final stakeholder workshop

On 29 April 2026, the ACCREU project hosted a final stakeholder workshop in Brussels to share findings from nearly three years of collaborative research. Participants evaluated the new research findings on sectoral results on impacts and adaptation (WP2) and macro-economic climate impacts and the economic viability of

adaptation strategies (WP4), as well as discussing the detailed findings on ADT and adaptation from the case studies in WP3. The workshop is written up as Milestone 2 (Final co-creation workshop).

There were three sections to the workshop, discussing various results with stakeholders.

The first session at the workshop was focused on the project's comprehensive assessment of costs and benefits of adaptation across various European sectors and regions (WP2). Key activities included small group sessions on the sectoral costs of climate impacts and adaptation across different sectors.

The second session shared the results of the adaptation case studies (WP3). This included an interactive poster walk to share the results of the economic appraisals of diverse adaptation case studies and their related policy insights. This was followed by a plenary discussion on.

The third session presented the emerging results of WP4 (noting these are still ongoing). This covered presentations on macroeconomic, distributional, fiscal, and financial implications across households, sectors, and regions.

The final session of the workshop outlined and discussed the forthcoming project's primary products for online communication of results: a Digital Handbook and a web-based Scenario Explorer. Feedback and inputs on both products were gathered from the participants to integrate the user perspective into the further development of the tools.

The day concluded with a spotlight discussion on remaining research gaps and the formulation of policy messages, which will be fed into Deliverable 1.6 and the design of the final policy briefs and synthesis report.

To ensure policy messages for the project were captured, as session was held to identify the key policy messages, and how to maximise policy messages from the project were. Following a prioritisation exercise, the most important points were identified, see Figure 5. These are also recorded in the workshop report (Milestone 2). These will be used for planned final synthesis report in Deliverable 5.2

Figure 5 priority policy messages identified by stakeholders

This session also asked stakeholder what the key research priorities were for the future. Again, a large number of ideas were identified, and a prioritisation exercise was used to identify the most important.

Figure 6 priority research priorities identified by stakeholders

These will also be included in the final reports to highlight where stakeholders see remaining gaps.

Integration of stakeholder input in research work

During the co-design phase of the project, a total of 227 research questions were gathered (112 research questions suggested by the team, and additional 115 suggestions by stakeholders), see Figure 2 earlier. This list of research questions was evaluated at each consortium meeting to check progress. With this approach, the stakeholders' inputs were taken as orientation for the research work and reflected on during the whole duration of the project.

At the time of the consortium meeting in April 2026 in Delft, the final numbers showed that the team had worked on **158 research questions** over the course of the project. This means that just over two-thirds of the total research questions identified were able to be addressed by the project team.

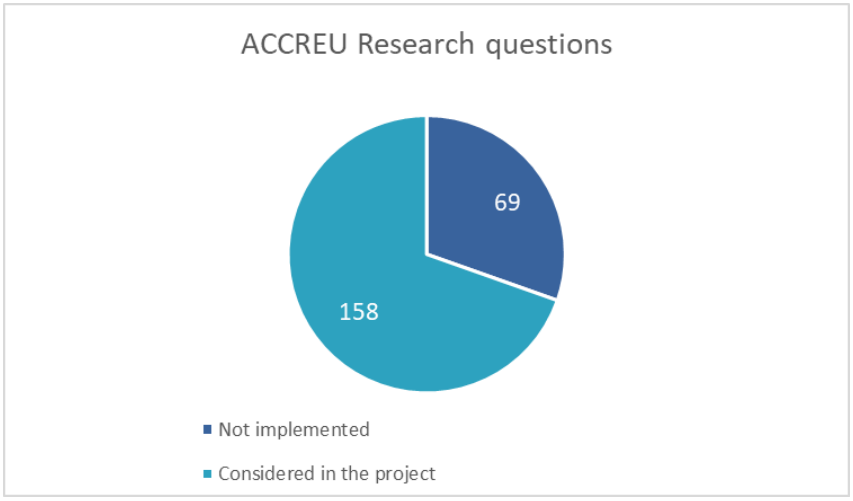

Figure 7 Final coverage of research questions in ACCREU

5. Co-delivery Phase

The aim of the co-delivery phase was to develop products and tools that synthesise the project's findings and then jointly disseminate these. The co-delivery phase is still ongoing and has been implemented through a range of activities documented in an internal dissemination tracker managed by CMCC.

Various opportunities have been taken up to give presentations at events e.g. combining ADT 2 workshop with the Third Wildfire Management Clustering Event, undertaking meetings with decision makers to share results and support uptake in relevant processes and documents e.g. engagement of the ADT 4 project team in the stakeholder consultation days for Bremen's Heat Action Plan and Climate Adaptation Plan.

Co-creation activities have also had policy impacts in a range of areas (see **Table 3**).

Table 3 Policy Impact of co-creation activities

Area	**Policy Impact**
Government adoption	CS7.1/2 (UK): Fed into HM Treasury Spending Review (budget allocations), Office of Budget Responsibility fiscal report, Climate Change Committee CCRA4, citizen forums Oct 2025, Defra NAP4 development. Extensive national-level integration CS7.3 (Cyprus): Cabinet adopted revised National Adaptation Strategy autumn 2025. First-ever comprehensive cost assessment for Cyprus provided to government. CS1.1 (Netherlands): Water board approved superdike design June 2025 for next planning phase
Government adoption (international)	International case study. Numbers from ACCREU fed into two global assessment reports the adaptation gap report 2024 and the adaptation gap report 2025), as well as providing data for the Independent High Level Expert Group on Climate Finance report. The ACCREU project is directly accredited in all reports. These results have, in turn, informed the global UNFCCC negotiations, with the study results on global adaptation costs cited in the UNFCCC Baku to Belem Roadmap to 1.3 Trillion.
Perspective shifts	CS1.2 (Germany): Helping regional stakeholders and planning bodies consider nature-based and hybrid solutions as viable components - shifting perception from grey-only to NBS. CS4.2 (Bremen): Drew attention to ways adaptation may overlook social justice dimensions"- developed monitoring indicators for equity.
Validation and guidance	CS2.2 (Sweden): Direct economic guidance to forest owner: fire-resistant trees + firebreaks most cost-effective. CS3.1 (Ebro): Validated current planning to restrict irrigation withdrawal. CS5.1 (Netherlands): Ongoing DNB collaboration - "learning process for developing further scenarios" for financial risk
Knowledge to practice	CS5.2 (Netherlands): Insurers: "workshops link knowledge to practice, ensuring insights take root" CS3.2 (Venice): Improved WWF understanding of climate-vulnerable zones, will support management strategy CS2.2 (Sweden): Direct economic guidance to forest owner: fire-resistant trees + firebreaks most cost-effective.

During the final phase of the project findings are being shared with stakeholders who have co-produced the results. The aim is to develop and refine the key messages from the research and to shape joint knowledge products to be disseminated by researchers and stakeholders to reach decision-making contexts.

Key findings discussed by stakeholders and the research team at the final workshop in Brussels (see above) that can be taken forward for final dissemination are summarised in **Table 4** (key policy messages from the project) and **Table 5** (key research priorities).

Table 4 – Overview of WP2 research findings for co-dissemination in final phase of the project

Climate impact	Findings
Energy demand	Hourly variability exceeds seasonal trends Cooling demand increases are largest in southern Europe Northern countries see largest reductions in heating demand
Heat on health and heat-related Adaptation	Heat-related impacts could lead to over 270,000 annual deaths and up to 150,000 hospitalisations in the "middle of the row" climate scenario (SSP2-RCP4.5) by 2070 The choice of climate pathway has major economic implications, with projected costs varying by hundreds of billions of euros depending on emission levels, underscoring the critical importance of mitigation Hospitalisation medical cost estimates increase from about €287–280m in 2030 to €424–646m by 2070, while WTP estimates grow from roughly €150m to €224–649m depending on the climate pathway Higher levels of AC adoption can reduce economic losses substantially. E.g, under RCP4.5 in the 2070s, costs decrease from €19 billion (high impact) to €4.8 billion with increased adaptation.
Labour force	It is a "cross cutting problem" All sectors and occupations, developing and developed economies will be affected Huge geographical heterogeneity The EU is on average less affected, but some southern EU regions can experience large negative impacts Adaptation (AC) can be very effective… but not in all sectors and it can be very costly. Mitigation is important
Wildfires in Europe	Scenarios strongly shape future fire risk. High emission scenarios lead to large increases in burned area, lowering emissions and land use change can help limit these risks Southern Europe remains the hotspot. The largest shares of burned forest (during the usual fire season) will remain concentrated in Mediterranean countries. Uncertainty is higher in emerging hotspots. There is still limited knowledge on emerging hotspots like Northern Europe, which are dominated by other risk drivers and fire seasons.
River floods and flood protection	Inaction is the most expensive option. Across all climate scenarios, doing nothing leads to flood damage costs escalating to ~€80B per year by 2080. Even modest investment in maintaining current standards significantly reduces this burden. Optimal adaptation creates net economic gains. Under RCP8.5, optimal adaptation yields ~24B/year in benefits against~12B/year in costs. Constant adaptation yields around ~12B/year in benefits against ~4B/year in costs. Regional differences demand local solutions River floods can increase in some regions while decreasing in others under the same climate scenario. EU-wide policies should account for this local complexity.
Sea level rise and costal adaptation	Hard infrastructures are economically optimal in densely populated areas Ecosystem restoration and retreat are cost-efficient solutions for rural areas Cost-benefit based adaptation decisions can reduce total cost of SLR significantly

Agricultural sector and costs of adaptation	Livestock is one of the most climate-exposed sectors, directly through temperature stress and indirectly through changes in the yield of their feed sources including field crops and grassland The ACCREU integrated framework links sectors through water and land resources via markets, revealing how climate impacts unfold across producers and consumers and how investments in adaptation can effectively reduce risks.

Table 5 – Overview of WP3 research findings for co-dissemination in final phase of the project

ADT/Topic	Findings
Transportation systems	Adaptation of infrastructure takes place by multiple actors at multiple scales. Understanding the mandate of each actor facilitates adaptation Transformational adaptation requires the coordination across actors, e.g. companies, transport service providers and government agencies Different value judgements will lead to different adaptation strategies and outcomes. These values can be made explicit in cost benefit analysis.
Food, Water & Biodiversity	Irrigation and water storage investments have mixed impacts on environmental flows in the Ebro and Thaya basins, highlighting the need for coordinated management to address complex cascading effects Agricultural adaptation can accelerate biodiversity loss, necessitating strategies that explicitly protect species and habitats. Declining pollination services pose a significant, Ulti-billion-euro risk to food production systems Coastal flooding threatens agricultural revenues and grass-based livestock systems, with uneven impacts across countries. Adapting only to slow-onset changes while ignoring coastal flooding risks increasing overall vulnerability
Comprehensive economic appraisal of flood adaptation measures	Comprehensiveness could be explicitly requested when commissioning CBAs Most CBAs focus only on prevention or mitigation measures: preparedness, recovery, and response measures are hardly assessed Sensitivity analysis around discount rates and co-effects and intangible risks could be a low hanging fruit
Flood risk, finance & adaptation in the Netherlands	Insurance incentives are effective Offering insurance discounts can lead to more building-level flood adaptation for businesses in the Netherlands The insurance market form plays a large role Expanding coverage to other flood types in combination with governmental support is the most effective Sectoral differences in effectiveness. The incentive can be targeted to highly exposed sectors to maximize effectiveness
The Costs and Benefits of national adaptation plans	NAP costs estimated at ~0.5% of GDP with option balance differing, reflecting country hazard profiles. UK analysis indicates adaptation costs could rise strongly after 2030 (adaptation of large stock of public assets (existing roads, hospitals etc) Public sector adaptation costs vary significantly - 55% in the UK versus 70% in Cyprus -illustrating how a nation's level of privatization dictates who foots the bill. This disparity raises questions of how to share costs, across countries, and across the EU (solidarity) Most adaptation actions yield net economic benefits, especially „soft" measures have high Benefit-Cost Ratios (BCRs). However, financial returns are often lower because many benefits are public goods / involve non-market benefits creating financing challenges

Forestry and ecosystems	Increased risk → Greater impact of adaptation as wildfire risk increases, the adaptation benefit-cost ratio will be high and warrant the considerable costs and complexity of protecting forests and ecosystems Adaptation must be context-specific Wildfire adaptation strategies must be tailored to local conditions - transformative green solutions could be met with resistance. Effectiveness depends on landscapes, risk profiles, and the socio-economic context. High complexity
Heat, Health, Vulnerabilities and Social Justice	Investments in adaptation to reduce heat impacts on health have clear co-benefits, but policies must consider differential impacts and vulnerabilities to ensure that the benefits accrue to all citizens. Health policy field is well-suited for integrating social justice aspects and could provide an example of how to integrate social justice into other areas of adaptation policy. Integrated mapping of climate hazards, socio-economic indicators and vulnerabilities highlights social-justice hotspots that heat-health adaptation should take into account. Engaging with local multipliers helps to integrate the specific needs and interests of vulnerable groups in the design and location of interventions supporting more socially just heat-health adaptation.

Regarding messaging and dissemination, deep engagement stakeholders have been consulted to identify key messages that the project should highlight in its deliverables and policy briefs.

Stakeholders have been asked to share project results with their own networks, supported through activities by the WP5 team who have identified relevant networks and newsletters to target for outreach. Interim versions of the two ACCREU online products, the web-based scenario explorer tool and Digital handbook, have been developed and were presented to stakeholders at the final stakeholder workshop in Brussels in April 2026. Written feedback was gathered to help improve presentation and usability of these two knowledge products and further testing with stakeholders will be undertaken as these products are developed.

Feedback on the policy briefs produced so far from the project review meeting and from stakeholders at the workshop will be used to improve the final two policy briefs coming in the last months of the project. Dissemination feedback from stakeholders attending the workshop included requests for:

- Production of synthesis products with examples and short, concise conclusions
- A single information hub for policy makers to easily find information, not only from the ACCREU project, but combined with results from other projects.
- A values disclaimer to identify who produced the results, how these were derived and which perspectives informed their production.
- The integration of top-down model-based analyses and information from bottom-up case studies

A final dissemination event, including presentations by stakeholders as well as researchers will be held towards the end of the project to share the final study results and potentially discuss these questions in further detail.

Monitoring and evaluation activities have been carried out throughout the project, gaining feedback on the process to support iterative adjustment. All aspects of the co-creation cycle (co-design, -production and -dissemination) in the project will be evaluated in Deliverable 1.6. in which insights from stakeholders and researchers will be brought together to reflect on how to improve collaborative research based on these experiences.