Users' Feedback on Demonstrations

Deliverable D5.2

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1. Overview and Methodology

The Copernicus for Urban Resilience in Europe (CURE) 1st Demonstration Workshop held on Friday 15th October 2021 aimed to address the main research question: 'How useful is the information and data produced by the Copernicus based new cross-cutting apps in decision-making and downstream services development for urban resilience related challenges?' More broadly the objectives of the workshop are specified as follows:

- Demonstrate the technical operational feasibility of the CURE cross-cutting thematic apps.
- Demonstrate that the apps are relevant for the enhancement of Copernicus core services and can capitalise from the corresponding product portfolio.
- Evaluate to what extent the umbrella urban resilience cross-cutting application can be a candidate for the operational Copernicus.

Accordingly, the 1st Demonstration Workshop provided the basis for the demonstration of the cross-cutting urban planning apps developed in CURE following initial development of products and apps. The aim is to get user feedback and assess operational feasibility, usability and effectiveness (see Deliverable D5.1 – Demonstration and Evaluation Methodology) of CURE urban resilience apps for city partner user communities, and at the same time the interface and feasibilities regarding the Copernicus Core Services.

1.1 Pre-Workshop Process and Methodology

In accordance with University of the West of England, Bristol (UWE) ethical requirements, an ethics application was submitted to the Faculty of Environment and Technology Ethics Committee in July 2021, with full ethical approval to run the workshop provided in August 2021.

Invitees to the workshop were identified via a collaborative process by the CURE consortium members, including CURE project front runner cities, follower cities, members of the CURE consortium, the CURE Advisory Board, Climate KIC and Copernicus Entrusted Entities.

Pre-workshop information was emailed to invitees in September 2021, notifying them of the workshop and asking them to save the date. Included were an overview of the workshop and draft agenda. A subsequent email followed in October 2021, with more detailed workshop information. This was in two parts. The first part consisted of an updated Workshop Agenda (see Annex 1), and Participant Information Sheet (see Annex 2); which provided information about taking part, what that involved, including how the workshop would be recorded, and that the resulting data would be collective and anonymous. The Participant Information sheet also explained that stakeholders would be able to withdraw from the research at any time. To ensure that stakeholders understood this usage and gave their consent, a link to an online consent form was provided within the email for stakeholders to sign.

The second part of the pre-workshop information sent to invitees including pre-workshop preparation for the stakeholders, comprising: 1) a request for stakeholders to review the eleven CURE apps as 5-minute videos on YouTube, as they were to be discussed during the workshop and 2) the questions to be asked in the workshop for each of the three CURE themes of Climate Change Mitigation - Heat and $CO_{2;}$ Climate Change Adaptation - Nature-Based Solutions and Flood/Subsidence; Healthy Cities - Health, Thermal Comfort and Air Quality. The questions were derived by using the approach elaborated in the

Deliverable D5.1 – Demonstration and Evaluation Methodology. The questions for each of the themes included:

- *What policies/strategies do you have in your city where CURE apps can offer distinct added value in promoting enhanced intelligence to support improved decision-making?*
- *What are the potential gaps and limitations that might inhibit the usability of the CURE apps, and which can form the basis for further CURE app development?*
- *What priority co-benefit linkages to other policy fields can support additional CURE app development?*
- *What is the potential added value of CURE apps, when integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?*

1.2 During the Workshop

The CURE 1st Demonstration Workshop took place via Microsoft Teams from 10:00 to 14.30 CEST with 54 stakeholders offering a diverse range of expertise and Member State representation, including representatives from City Planning (17); Climate KIC (2); Copernicus Entrusted Entities (5); European Commission (1); EARSC (1); and CURE partners (21). The workshop was run as a single meeting, without breaking out into small discussion groups to ensure that all the presentations, discussions, information and questions arising were available for all stakeholders, and so promoting common understanding.

The workshop was managed in two parts. The first part comprising three short presentations that set the context for the workshop, in advance of the second part consisting of three discussion sessions. The substantive presentation of part one consisted of a 'welcome' presentation providing an overview of the CURE project, followed by presentations giving insights into perspectives of the CURE user requirements identified and published in Deliverable D1.1 – Summary of User Requirements.

During part two of the workshop, the three discussion sessions were presented on a common format, each addressing one of the CURE themes including Climate Change Mitigation - Heat and CO_2; Climate Change Adaptation - Nature-Based Solutions and Flood/Subsidence; Healthy Cities - Health, Thermal Comfort and Air Quality.

These three sessions followed a common three-step presentation methodology. This commenced with a presentation setting the context of each theme and was followed by the CURE apps Demonstration comprising a five-minute video explaining each the CURE apps identified in relation to the theme, supported by a short question and answer session between stakeholders and the relevant CURE project partners. Finally, stakeholders were asked their views through Stakeholder Dialogue on the theme related questions (as above). The workshop closed with a Mentimeter Challenge on post-covid "new normal" city planning priorities, followed by a short review of CURE next steps following the workshop.

1.3 Following the Workshop

Following the workshop, a follow up email was sent to stakeholders with a link to the follow up questionnaire (see Annex 3). Links to the three CURE thematic and eleven application-specific videos were also included to remind stakeholders of the workshop presentations. Workshop audio recordings were transcribed and checked for accuracy by UWE researchers with the specific contributors, and the revisions incorporated. The transcripts were anonymised so individual opinions could not be attributed to the stakeholders, and then analysed according to the aims and objectives of the Demonstration

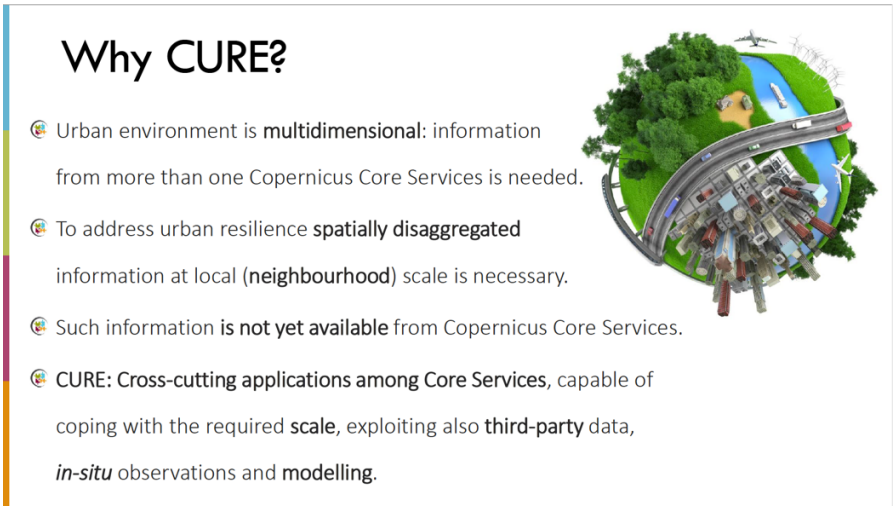
Workshop informing CURE project partners of insights gained to progress the eleven CURE apps during the next stages of the CURE project.

2. DEMONSTRATION WORKSHOP – INTRODUCTION

2.1 CURE Concept, Outcome and Vision

CURE concept, outcome and vision is demonstrated, as CURE cross cutting apps (Slide 1) respond to the need for spatially disaggregated data supporting sustainable and resilient urbanisation (Slide 2). The CURE apps are developed on the basis of extensive user engagement with urban planning, business and scientific communities interacting with CURE service providers (Slide 3), to define 11 cross-cutting apps supporting wide-ranging decision-making and downstream services development (Slide 4). The CURE system (Slide 5) functions as a DIAS based platform linking Copernicus Core Services to CURE apps accessible via the CURE Copernicus Core Service Interface (CCSI). This interface (Slide 6) supports open search specifications, provides downloadable content and promotes semi-automatic registration of resources. CURE outcomes (Slide 7), among others, include the online platform combining Copernicus Core Services, support urban resilience planning and provide uniform data and consistent measurements. These outcomes define and drive the CURE vision (Slide 8) for short-term integration of several CURE products into the Copernicus Operational Service Portfolio, and longer-term for the development of a Copernicus Urban Service.

Slide 1



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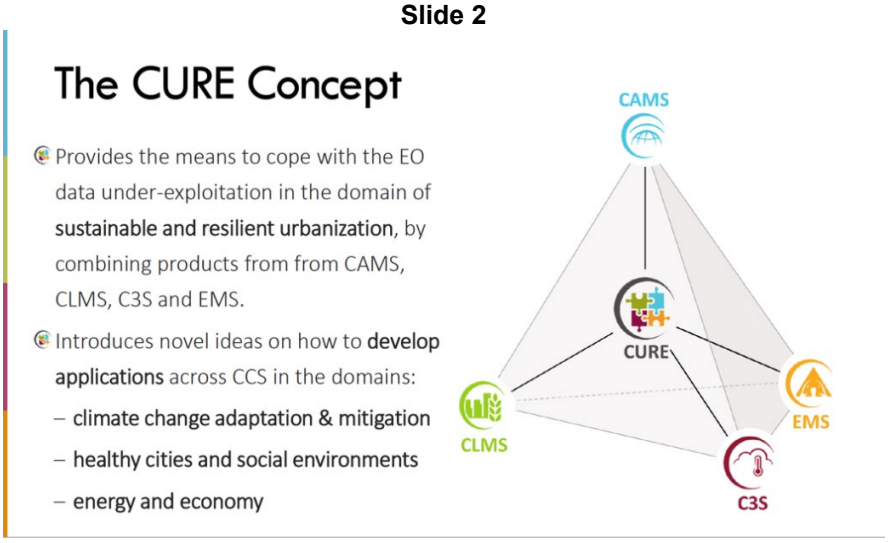

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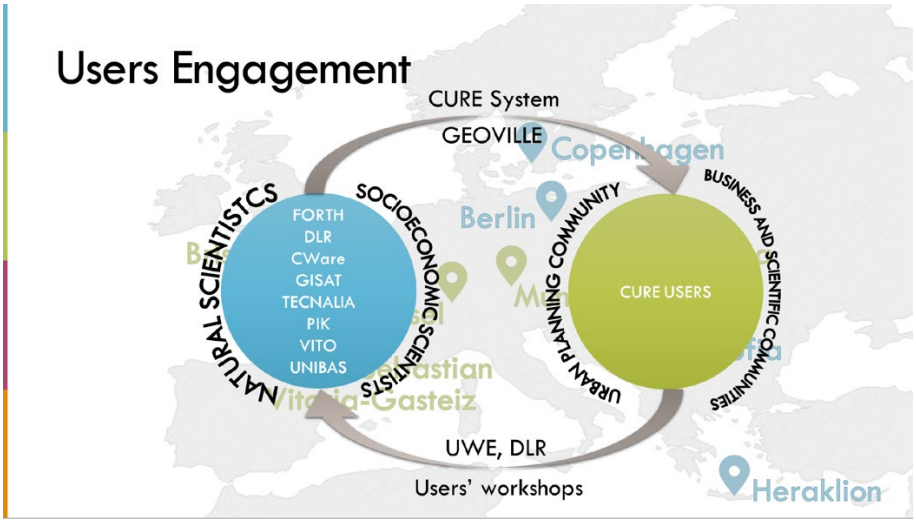
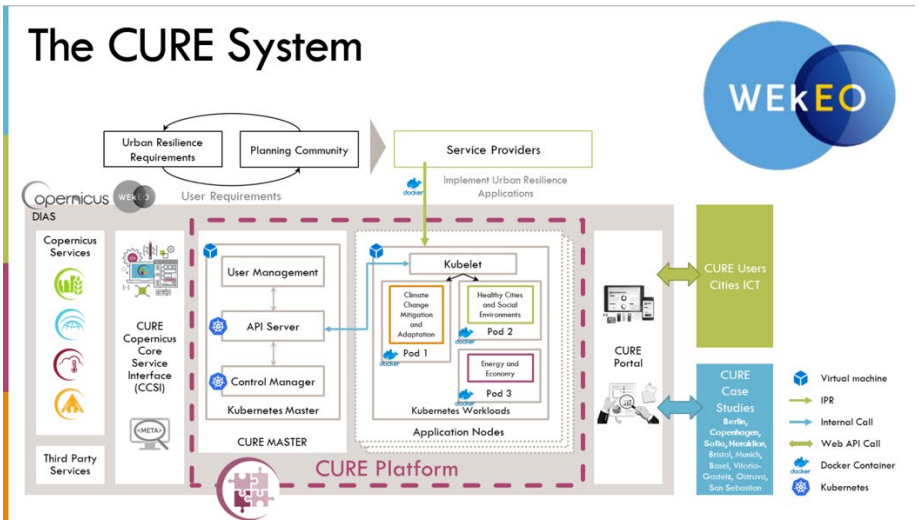
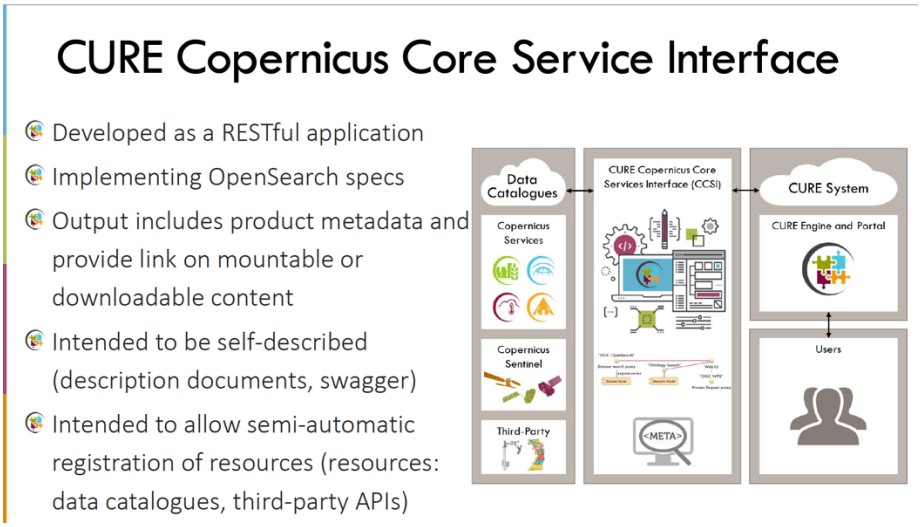


Slide 4

Slide 5



Slide 6



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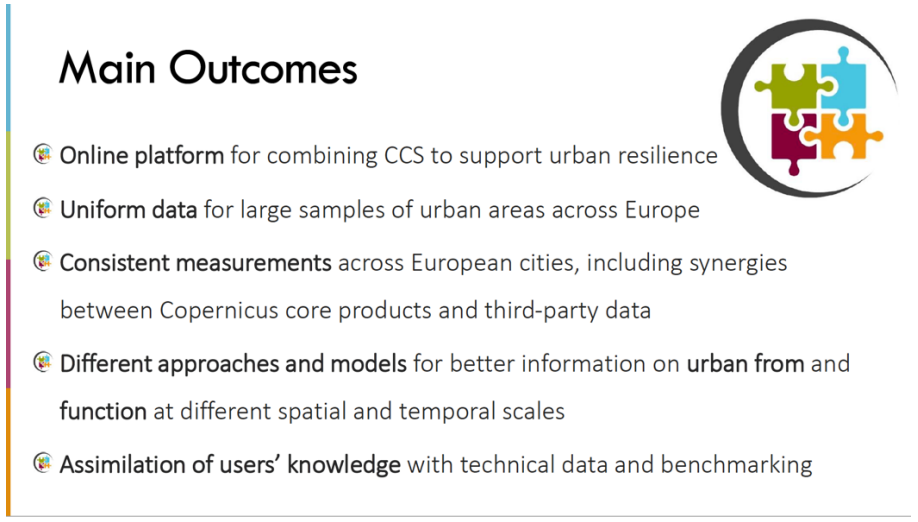
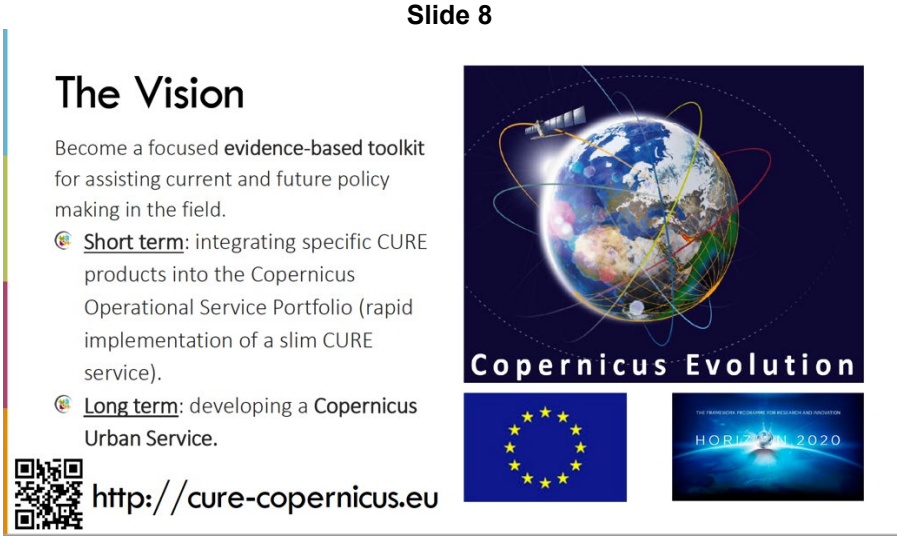


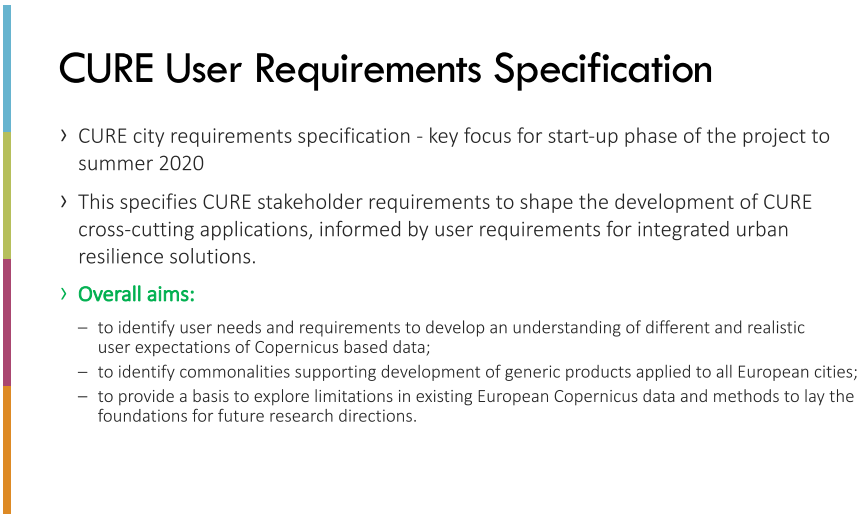
Slide 8



2.2 CURE User Requirement Specification

CURE user requirement specification formed a key focus for the project from the project inception in 2020 (Slide 9). The overall aims were to identify user needs for Copernicus derived urban planning decision-making intelligence; to support the development of generic products; and to provide the basis for future research. The first stage of user requirements engagement process (Summer 2020) emphasized the need for tools to support cross-cutting planning strategy and policy integration (Slide 10). These cross-cutting apps should act as pilots for transferability and downstream services development. The CURE cross-cutting apps should also provide the basis for integrated impact assessment delivering policy co-benefits in relation to climate change resilience, health and well-being (Slide 11). These requirements are a response to the complex interconnectedness of socio-economic and environmental issues in an urban context, that requires a holistic approach seeking "win-win" integrated solutions. Central to CURE application development is engagement with city user requirements, including both Front Runner Cities (Slide 12) and Follower Cities (Slide 13). These engagements define the decision-making needs for urban management focused on climate resilience.

Slide 9



Slide 10

CURE User Requirements Specification

- CURE user requirements engagement process (Summer 2020) emphasised in particular the need for tools to support cross-cutting planning strategy and policy integration.
- So power of CURE is defined through the CURE system delivered by DIAS linking CURE cross-cutting applications together, e.g. AQ / NBS and overheating data integrated with data from various sources such as socio-economic, and in situ data etc. providing cause-effect analyses.
- Cross-cutting aspects of the CURE apps provide basis for integrated impact assessment and implementation monitoring capabilities delivering policy co-benefits in relation to climate change resilience, health and well-being and associated policy initiatives concerning mobility and quality of life and cycling/walking compact cities and NBS etc.
- These cross-cutting applications act as pilots for transferability and downstream services development. Process assists in filling gaps in the Copernicus offer for urban areas, and identifies in what extent new observation requirements for space borne or other non-satellite data sources are needed to improve the specified applications.

Slide 11

CURE User Requirements Specification

- User requirements are response to complex interconnectedness of socio-economic and environmental issues in the urban context - define the decision-making needs for urban management focussed on climate resilience.
- Complex problems require a holistic approach, together with an integrated assessment of urban policies supported, seeking “win-win” integrated solutions. Policy co-benefits are central to the delivery of the transformation agenda adopted by city politicians globally.
- Policies targeting climate resilience, compact cities and enhanced urban quality of life lead to major climate co-benefits e.g. reduced greenhouse gas emissions. Clear co-benefits arise, for example, in improving air quality by reducing fossil fuel emissions creating accompanying positive health and environmental impacts.

Slide 12

CURE Application Development – Front Runner City Engagement

AP	Cross-cutting applications	Berlin	Copenhagen	Sofia	Heraklion
01	Local Scale Surface Temperature Dynamics (FORTH)	•	•	•	•
02	Surface Urban Heat Island Assessment (DLR)	•	•	•	•
03	Urban Heat Emissions Monitoring (UNIBAS)				•
04	Urban CO_2 Emissions Monitoring (UNIBAS)				•
05	Urban Flood Risk (GISAT)				•
06	Urban Subsidence, Movements and Deformation Risk (GISAT)				•
07	Urban Air Quality (VITO)			•	
08	Urban Thermal Comfort (VITO)		•	•	
09	Urban Heat Storage Monitoring (FORTH)				•
10	Nature-Based Solutions (TECNALIA)			•	
11	Health Impacts (socioeconomic perspective) (CWare)		•	•	

Slide 13

CURE Application Development – Follower City Engagement

AP	Cross-cutting applications	Bristol	Ostrava	Basel	Munich	San Sebastian	Vitoria-Gasteiz
01	Local Scale Surface Temperature Dynamics (FORTH)	•	•	•	•	•	•
02	Surface Urban Heat Island Assessment (DLR)	•	•	•	•	•	•
03	Urban Heat Emissions Monitoring (UNIBAS)			•			
04	Urban CO_2 Emissions Monitoring (UNIBAS)			•			
05	Urban Flood Risk (GISAT)		•				
06	Urban Subsidence, Movements and Deformation Risk (GISAT)		•				
07	Urban Air Quality (VITO)	•	•				
08	Urban Thermal Comfort (VITO)		•			•	•
09	Urban Heat Storage Monitoring (FORTH)			•			
10	Nature-Based Solutions (TECNALIA)					•	
11	Health Impacts (socio-economic perspective) (CWare)	•					

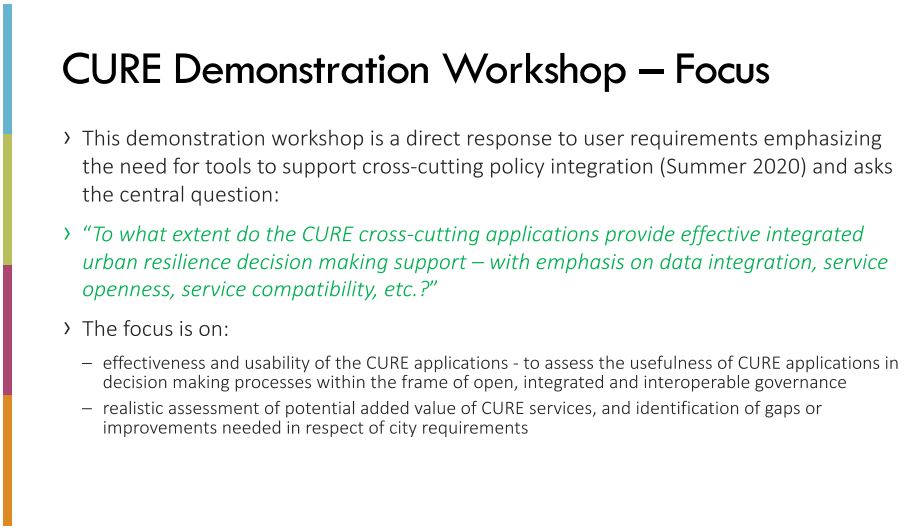
3. DEMONSTRATION WORKSHOP – PLANNING STRATEGY THEMES

The 1st Demonstration Workshop was focussed on:

- effectiveness and usability of the CURE apps - to assess the usefulness of CURE apps in decision-making processes within the frame of open, integrated and interoperable governance
- realistic assessment of potential added value of CURE services, and identification of gaps or improvements needed in respect of city requirements (Slide 14).

Stakeholder engagement was organised according to 3 grand challenges for European planning, concerning Climate Change Mitigation, Climate Change Adaptation and Healthy Cities, to which CURE apps correspond (Slide 15). Climate change mitigation challenges were the focus for stakeholder dialogue in relation to a range of CURE heat and CO_2 related apps (Slide 16). Climate change adaptation challenges were the focus of stakeholder engagement concerning CURE nature-based solutions and flood/subsidence apps (Slide 17). Finally, healthy city challenges formed the basis for stakeholder discussion concerning CURE health, thermal comfort and air quality apps (Slide 18).

Slide 14



Slide 15

CURE Demonstration Workshop - City Grand Challenges

The focus of this demonstration workshop is defined in terms of 3 grand challenges for European city planning – for which integrated planning strategies and policy frameworks aim to secure policy co-benefit "win-win" solutions. These grand challenges together with the associated CURE apps structure our workshop engagement today as follows:

- **Climate Change Mitigation** - *Heat and CO_2*
- **Climate Change Adaptation –** *Nature-Based Solutions and Flood/Subsidence*
- **Healthy Cities** – *Health, Thermal Comfort and Air Quality*

Slide 16

Climate Change Mitigation - Heat and CO_2

- CURE applications supporting integrated urban resilience solutions for climate change mitigation recognise overheating as one of the most important parameters in climate monitoring.
- In response the CURE **surface temperature dynamics application (AP01),** monitors the spatio-temporal behaviour of cities' surface temperature. Additional heat related CURE applications provide frequent local scale estimations for cities related to **surface urban heat island (AP02), urban heat emissions (AP03), and heat storage (AP09).**
- All assist urban planners to optimize their mitigation strategies with regard to heat stress, and sustainable development optimisation. Combined with other CURE applications, co-benefits are secured in relation to key resilience challenges such as **CO_2 emissions reduction (AP04).**

Slide 17

Climate Change Adaptation – Nature-Based Solutions and Flood/Subsidence

- CURE applications supporting integrated urban resilience solutions for climate change adaptation include **nature-based solutions (AP10)**, generating increased understanding of co-benefits arising from green roof potential and performance of buildings for energy conservation with co-benefits of water run-off regulation, thermal comfort, air quality improvement, and overheating mitigation.
- Similarly the urban **flood risk (AP05)** assessment promotes flooding prevention, as flood risk assessment supports urban planners in climate change adaptation activities, as well as during emergency situations supporting city response activities.
- **Subsidence risk, deformation and movement risk (AP06)** assessment also couples hazard monitoring with up-to-date assets information (land cover/use at building block level).

Slide 18

3.1 Climate Change Mitigation: Heat and CO_2

3.1.1 Policy Overview

Cities urgently need to respond to a range of impacts including heatwaves, wildfires, extreme weather events e.g. storms, hail etc., more intense precipitation, coastal flooding and sea level rise, pluvial and river flooding and drought. Building urban climate resilience requires taking action to mitigate, while also adapting and transforming to withstand climate change impacts. The CURE heat and CO_2 related apps contribute to urban resilience supporting local scale surface temperature dynamics monitoring, surface urban heat island assessment, urban heat emissions monitoring, urban heat storage monitoring and urban CO_2 emissions monitoring. The apps can be integrated with CURE application promoting urban planning responses (nature-based solutions and healthy cities).

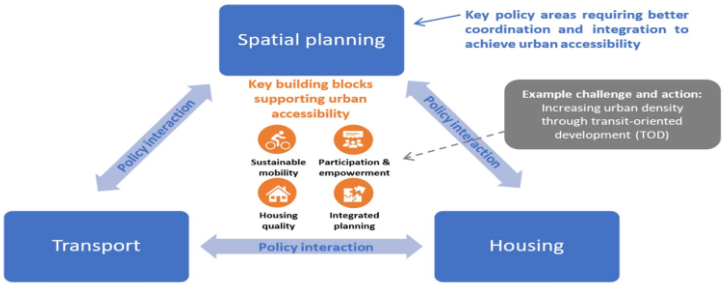
Cities across Europe are seeking to reduce or prevent greenhouse gas (GHG) emissions through a range of strategies. Cities can move to renewable energy sources, retrofit buildings to be more energy efficient, and confine the major sources of GHG emissions associated with urban transport by developing more sustainable transport systems, active travel and the promotion of more sustainable uses of land. Moving towards better urban accessibility and sustainable transport requires strong cross-sectoral collaboration across a range of policy domains. This climate change mitigation nexus focuses on coordination between: transport policy; spatial/land use planning; and housing policy. Exploring the 'space' between these three policy areas helps to identify solutions that address accessibility while optimising integration and strengthening outcomes in each area (Slide 19).

Addressing a multitude of interlinked urban challenges is a key lesson for cities, exploiting policies that explicitly aim to achieve better accessibility. These go far beyond the environmental burden of excessive motorised transport in cities and hold the potential of fundamentally reconfiguring how we live, work and interact with each other. Implementing transport policy reforms that promote walking, cycling, public transport and other forms of sustainable mobility can play an important role. However, these need to be linked with spatial planning and housing policies to achieve real urban accessibility.

These issues concerning climate change mitigation were outlined in the Demonstration Workshop (Slides 20 and 21) forming the basis for questions supporting stakeholder dialogue engagement in the workshop (Slide 22).

Slide 19

Climate Change Mitigation – Integrating Policy Areas



Urban Sustainability in Europe - What is driving cities' environmental change? (EEA Report No 16/2020)

Slide 20

Climate Change Mitigation – Policy Co-benefits

- European cities challenge to address climate change mitigation, and reduce CO_2 emissions, simultaneously enhancing mobility creating high quality and efficient transport systems.
- Requiring strong cross-sectoral collaboration across a range of policy domains - nexus focus on coordination between: transport policy and spatial/land use planning and housing policy. Planning solutions lie in the 'space' between these three policy areas.
- Tackling unsustainable trends in this sector requires a recognition that car-based journeys in urban areas are generally the least optimal - logical option, therefore shift from cars towards walking, cycling and public transport is needed.
- Covid-19 pandemic highlighted the urgent need for new responses as existing infrastructure and urban form are reshaped significantly – impacts include huge reductions in public transport use, renewed investment in walking and cycling but also increased use of private cars with significant implications for climate change mitigation.

Slide 21

Climate Change Mitigation – Planning Strategy Responses

15 Minute City Solutions (Neighbourhood Level)

- Covid-19 pandemic shows homeworking as viable alternative to office-based work and companies are rethinking the need for office space in urban centres - associated changing accessibility demands reduce the need for conventional transport and significant impact on land uses and existing transport networks.
- In response at neighbourhood level a new spatial mix of economic activities, services and amenities is emerging with focus on compact and mixed-use development, supported by 15 minute city solutions.

Transit-oriented Development (TOD) (City-wide Level)

- Transport, land use and economic growth can be managed more efficiently if planned in an integrated way as public transport and compact urban development mutually reinforce each other.
- TOD creates important co-benefits beyond mitigating urban sprawl and shaping more accessible polycentric cities - includes relieving congestion and shifting to more sustainable transport modes, improving air quality, boosting economic growth, and improving the quality of places.

Slide 22

Climate Change Mitigation - Engagement Questions

- What climate change mitigation policies/strategies are you aware of where CURE heat and CO_2 apps can offer distinct added value in promoting enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that inhibit the usability of the CURE apps, and which can form the basis for further CURE app development?
- What priority co-benefit linkages to other policy fields can support additional CURE app development – e.g. linking GHG and urban warming to urban transport in addressing climate change mitigation and carbon neutral cities policy challenges?
- What is the potential added value of CURE heat and CO2 apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?

3.1.2 Stakeholder Dialogue

Stakeholder dialogue in this Climate Change Mitigation session related to the general development and capabilities of the CURE apps, with stakeholders offering recommendations to the CURE project team and app developers regarding the usability of the CURE apps.

Questions Arising

Question 1: The first question posed by a city stakeholder sought more understanding of the users' engagement process in the CURE app development from the beginning of the project, in particular: 1) whether users' involvement was continuous throughout the project, or only at the beginning of the project, or at just at the end of the project; 2) whether users are interviewed; and 3) whether there is a process to provide feedback before the end of the project. The CURE project team responded to explain the user engagement process, which includes a continuous engagement cycle of user input from the beginning and throughout the project, with changes being made as necessary in line with users' feedback.

Question 2: A further question from a city stakeholder related to surface temperature results shown for Berlin, although this question is also relevant to other results. They wanted to know whether these were interim or final results, and how they can be proved by the user. This stakeholder also wanted to know whether it is possible to get information in GIS format, rather than as just a presentation slide. The CURE project team replied to explain that this was currently an interim version of results, and this applied to all cities. They also explained that all the initial data and the geospatial data will be made available, and that the full system will be available via DIAS next year. However, interim access will be available once the apps have been integrated into the system, to support submission of users' insights and feedback.

Comments/Recommendations

Stakeholders also provided insightful comments and recommendations for the CURE project team and app developers with regard to the user engagement process and the usability of the CURE apps.

Comment 1: One stakeholder stated that it is interesting for the city to prove the existing modelling results and the sentinel results, and recommended that it would be beneficial to get interim or final results before the end of the project, to provide feedback on the usefulness of the results.

Comment 2: The same stakeholder also mentioned more general views, i.e., Sentinel data is not widely used as it is not user friendly, for example Sentinel data is not easy to access, or if it is accessible then users do not have knowledge of the metadata. As such, this stakeholder recommended that CURE apps should be user friendly for all and that day-to-day usability of the CURE apps within municipalities should be one of the most important outcomes of the CURE project, stated as follows:

"(…) one of my ideas is that what will be developed must be of great usability for all. (…) the usability, I think, is one of the most important things" (Stakeholder).

Comment 3: Another stakeholder agreed with this view, and stated that there is interest from their city to get the apps and work with them, and understands how they can be integrated into their existing systems, to start testing the CURE system from different user perspectives.

"It could be very interesting to get up and get our hands dirty, so to speak, and get the tools in our hands to test them and work with them and understand how we can integrate them into our systems and not just see them on a slide" (Stakeholder).

Comment 4: This stakeholder also explained that the graphics and visual aspects of the CURE presentation slides are also of interest, as the CURE apps could support stakeholder engagement, policy explanation and behavioural change by offering technical decision support tools.

Overarching City Challenges

Stakeholders provided details about the contexts and challenges faced in their city, followed by explanation about their specific post-pandemic "new normal" experience. Additionally, feedback was provided on the CURE Demonstration Workshop.

Comment 5: One stakeholder explained that the broad challenge for their city was to achieve climate neutrality by 2030 and stated that the CURE results could be invaluable in achieving this ambition.

Comment 6: Another stakeholder provided a detailed presentation of their urban planning challenges, including significant data gathering and working practice challenges. They described how they had just developed a climate change mitigation and adaptation plan, together with sustainable energy development plan, but, that there were "gaps" in the plans due to lack of available data. In particular data problems concern calculation of CO_2 emissions; as there is no reliable data on transport, traffic volumes, or waste emissions, and lack of detailed data on flooding, intensive rainfall and resulting flood water distribution. They also described how use of geographic information systems (GIS) in the local authority departments is low, and that work outsourced to subcontractors, who do not work in GIS, provided results for the local authority in unsuitable PDF format.

Comment 7: Additionally, they described that there is disconnect between the urban planning department and other departments, for example air quality and energy, and an absence of data gathering resulted in poor intelligence provided to the urban planning department. They also described weak implementation of planning recommendations due to external constraints, for example, with land in private ownership undermining implementation. However, it was stated that the urban planning department does aim to fill data gaps and is aware of what data is needed, hopefully, paving the way for further application of decision support tools based on remote sensing.

Post pandemic "new normal"

Comment 8: Post-covid situations from two CURE city partners were presented, and for one city, two stakeholders provided their insights and reflections. One stakeholder explained how their city now had a greater share of private car usage, an increase by at least 5%, due to concerns in using public transport, and that this resulted in higher overall CO_2 emissions compared with pre-pandemic levels. They also stated that it was challenging to get people to return to public transport usage, suggesting important opportunities for CURE apps in relation to "new normal" city challenges.

"I think that it is one of the elements that we could also look into on these tools, is not just as technical administrative tools, but that they also have a very strong engagement element and explanation" (Stakeholder).

Comment 9: Another stakeholder described mostly today their country was 'back to 'normal', although there could be possible decreases in public transport usage and possible increases in private car usage. They also explained how there had been a social media outrage about park and open space closures during the pandemic and that they had surveyed people's use of parks and open spaces post lockdown aiming to discover whether people's awareness and valuation of parks and open spaces had increased.

Comment 10: Another stakeholder from the same city provided some additional reflections on the same issue regarding use and valuation of parks and open spaces.

"We don't have so much collection of the data and we don't have the opportunity to see the difference between this year and last year, but I could say that many things changed and I can see it in the everyday life in the city" (Stakeholder).

They described how during the pandemic many sports facilities were closed and that therefore many more people exercised in parks. They also explained that, due to the pandemic, people had moved from the city to the surrounding villages, and that accordingly city planners needed to implement good transport links from villages to the city to enable people to travel to the city for work. Additionally, they stated that building and restaurant prices in the city have increased, although some restaurants have closed. These post pandemic "new normal" changes are all for consideration in the planning of the future business development of the city.

Workshop Feedback

Comment 11: A workshop stakeholder found attending the CURE Demonstration Workshop particularly insightful. This stakeholder cited listening to the problems that arise for cities as they work through them, in particular in relation to responses to the post-covid "new normal", as being of particular use.

"So far today, I've just found it very useful to get a view as to what's available and what might be useful to the cities and the detailed work we're doing with them. So thank you" (Stakeholder).

3.2 Climate Change Adaptation: Nature-based Solutions and Flood/Subsidence

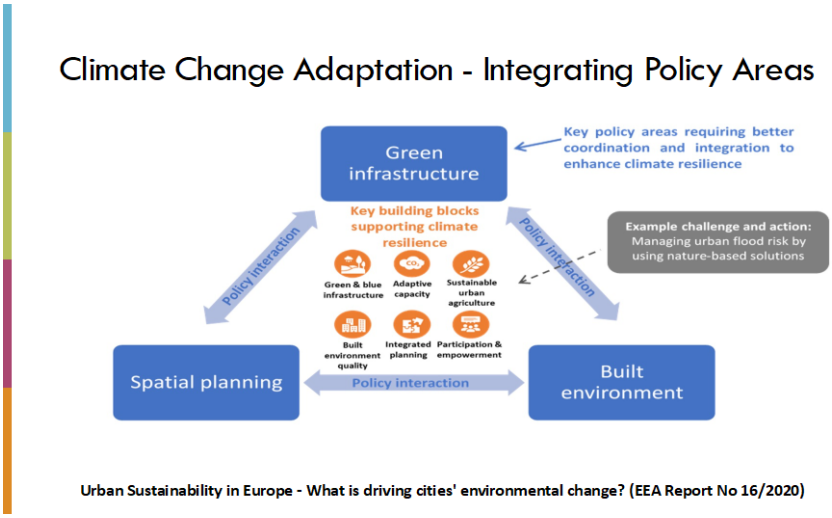
3.2.1 Policy Overview

Becoming a more resilient city and adapting to climate change requires coordinated action across a wide range of policy areas, and the CURE nature-based solutions and flood/subsidence apps aim to assess not only the challenges for adaptation (flood and subsidence risk assessment) but also to promote urban planning strategy responses (nature-based solutions). The adaptation nexus focuses on 3 interconnected policy areas: spatial planning, green infrastructure, and the built environment. Considering these together can lead to a more transformative approach towards adaptation to climate change impacts (Slide 23). Addressing adaptation and mitigation together may also be cost-effective way of improving climate resilience. Climate change is expected to increase the intensity and frequency of extreme rainfall, which is one of the main drivers of urban flooding. Flood risk in cities is exacerbated by the extent of impermeable land surfaces, coupled with housing and commercial development in river floodplains. The main cause of urban flooding is the increase in soil sealing, resulting in the limited land area for water absorption or storage, that increases the pressure on drainage systems which often lack capacity to handle intense rainfall events.

There is increasing attention on the potential of nature-based solutions to address urban flood risk. Nature based solutions include creating and enhancing green infrastructure in cities, and smaller-scale actions such as installation of green roofs. They use the features and system processes of nature in order to achieve desired outcomes, for example, using natural processes to reduce urban run-off and increase urban water storage e.g. tree planting, creation of reed-beds and ponds for temporary water storage, etc. The potential for a range of co-benefits from adaptation interventions to build urban climate resilience is evident. Besides reducing flood risk these include multiple a) social (e.g. health and quality-of-life, enhanced by creating green spaces and encouraging active travel in space for cycling and walking with improved air quality); b) environmental (e.g. biodiversity, reduced pollution, reduced urban heat island effect); c) climate mitigation (e.g. carbon sequestration); and d) economic (e.g. reduced energy consumption) benefits.

These issues concerning climate change adaptation were outlined in the Demonstration Workshop (Slides 24 and 25) forming the basis for questions supporting stakeholder dialogue engagement in the workshop (Slide 26).

Slide 23



Slide 24

Climate Change Adaptation - Policy Co-benefits

- Building urban climate resilience requires taking action to avoid, minimise, withstand climate change impacts, while also adapting and transforming as needed.
- Climate change adaptation enhancing city resilience requires coordinated action across a wide range of policy areas, including the interconnected policy areas of spatial planning, GI and built environment. Cross-sectoral engagement leads to more transformative approaches to both adaptation and mitigation to climate change impacts.
- Covid-19 pandemic encourages local policy makers to act as it highlights the importance of city resilience to unprecedented shocks, and the pandemic has shown transformative changes can be implemented much faster than previously assumed.
- But crucial knowledge gaps restrict cities ability to act, defining the need for CURE apps, for example urban flood risk applications supporting the Copernicus European Flood Awareness System, to help informed decision making and action.

Slide 25

Climate Change Adaptation - Planning Strategy Responses

Nature-Based Solutions (NBS)

- Integrating spatial planning and built environment policies to support green/blue infrastructure strategies addresses multiple aspects of climate resilience. This highlights the potential for a range of co-benefits from adaptation interventions to build urban climate resilience.
- These co-benefits help societies address a variety of environmental, social and economic challenges including adaptation e.g. flood risk management and prevention e.g. carbon sequestration outcomes; improving QoL by creating or enhancing green spaces; encouraging sustainable active travel; providing human health benefits by improving air quality.

Urban Flood Risk/Subsidence

- A range of measures can be used to address urban flood risk with increasing attention to the potential for NBS to provide multiple co-benefits processes, reducing urban run-off and increasing urban water storage e.g. tree planting, creation of reed-beds and ponds for water storage, and enhancing resilience to urban flooding e.g. restoring wetland areas and floodplains.

Slide 26

Climate Change Adaptation - Engagement Questions

- What climate change adaptation policies/strategies are you aware of where CURE nature-based solutions and flood/subsidence apps offer distinct added value in promoting enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that inhibit the usability of the CURE apps, which can form the basis for further CURE development processes?
- What priority co-benefit linkages to other policy fields can support additional CURE development process – e.g. linking nature-based solutions and flood/subsidence assessments to urban warming and compact city development, addressing both mitigation and adaptation policy challenges?
- What is the potential added value of CURE nature-based solutions and flood/subsidence apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?

3.2.2 Stakeholder Dialogue

Stakeholder dialogue in the Climate Change Adaptation session addressed two themes. First, 'City Strategies' – including climate adaptation and climate change projects and the implementation of a Zero Emission Zone. Second, CURE Apps in Practice, with city stakeholders reporting how they are implementing the CURE apps into their planning work.

Questions Arising

Question 3: In relation to the nature-based solutions app one stakeholder enquired about the technique for producing the recommended maximum size for greening a rooftop (i.e., How are buildings seen from satellite and how are rooftops evaluated? What city building data is included?). They also had concerns about working after the project, as they explained that previously they have had to engage third parties to combine their building data with Sentinel data. Members of the CURE project team responded by explaining the rooftop greening process, and that the aim is for CURE services to be automated and streamlined as much as possible to make them user friendly. It was also added that subject to budget, there may be opportunities to implement the CURE apps in other European cities too.

City Strategies

- Climate Adaptation and Climate Change

Comment 12: There were two stakeholders from this city, the first reported a huge problem with climate adaptation and climate change issues, and with air quality.

Comment 13: The second stakeholder reported on the city's Climate Adaptation Plan and explained that it mainly focused on measures for urban heat islands, including the restoration of public water sources. The second stakeholder also added that the planning department is waiting for an update on the quality and quantity of the city's groundwater and surface water sources, as alternatives to mitigate risks associated with current drinking water supply derived from dam storage.

Comment 14: Furthermore, it was reported that the city has recently become involved in the European Green Deal and is a stakeholder in the European Green Capital 2023 to help leverage additional green and health related projects.

"We are trying to get involved in more projects which are connected with the green areas and soft measures about how to get citizens out of their cars and to try to get more healthy life and physical activity life" (Stakeholder).

For example, the Green Ring project will be a 32km circular pedestrian route including cycle lanes to cater for the many who cycle in the city where there is currently no cycle network provision. Potentially in a year's time 4km out of the 32km will be ready. A strategy for physical activity and sport is also being implemented, which promotes an active lifestyle leaving the car at home. There is also a large project to connect the city to the nearby mountain upland, which includes 'green wedges' providing opportunities to draw cool mountain air into the city.

Comment 15: Furthermore, the city has a significant flood risk addressed in the city's Development Plan flood risk analysis which concluded that more detailed analysis about flood risk and more preventative measures are needed. It was also noted that the local authority is waiting on the central body in charge of developing the River Basin Management Plan and the River Flooding Management Plan to provide additional flood risk data. However, funding is required for this data gathering and analysis. Finally

related to this issue recommendations have been made for new wetlands retention volumes to be modelled and wetland restoration to be planned.

- Zero Emission Zone

Comment 16: The city is in the early, ongoing stages of implementing a Zero Emissions Zone, which is a legal requirement for Spanish cities with over 50,000 inhabitants. This zone is being introduced through a new Climate and Air Quality Plan, with the aim to control the quality of emission of the cars entering the zone. The methodology is still work in progress, although it is suggested that the focus area is on the city centre and will be implemented by 2023.

Comment 17: This stakeholder also explained that, for their city, previously health and air quality have not been critical issues. They described how their city complies with all the legal standards and almost all the previous guidelines from the World Health Organization (WHO). However, they continued to explain how in the context of zero emission zone implementation revised thinking on the adverse impacts for poor air quality for public health had arisen.

"We are starting to work for a zone of zero emissions. And, I find it very important, everything related to mobility and air quality. Especially after the new guidelines of the World Health Organization" (Stakeholder).

This stakeholder expressed how thinking about mobility provides a new lens through which to view their work and strengthen the argument for new mobility data including the monitoring of transport emissions.

CURE Apps in Practice

- Subsidence Hazards

Comment 18: This stakeholder explained that their city lies within a former mining region, and that accordingly, there are many subsidence problems in the surrounding area, which have wider implications for planning development. The stakeholder reported that the CURE project is already inputting data for practical application to aid prioritization, stakeholder discussions and production of scenario options.

- Nature-Based Solutions and climate change adaptation

Comment 19: This stakeholder emphasised the view that the Nature-Based Solutions app is an insightful tool supporting the review of the city's urban plan, as it provides useful input for climate change mitigation and adaptation assessment.

"I find that's very interesting to have a tool that can give us information about how green roofs and nature-based solutions can contribute to mitigation and adaptation in climate change" (Stakeholder).

"(…) we want to bring the application a bit beyond the state of the art" (Stakeholder).

Comment 20: This stakeholder explained that advancing the CURE Nature-Based Solutions app beyond the state of the art would be done, for example, by identifying green roof potential using LIDAR information and alternatives to LIDAR. The stakeholder explained that one aim of this app could be to enhance the prioritization of green roof deployment. The prioritization could be enhanced when combining results from the app, using the output of the app as an input to other apps, for example specifying thermal roof comfort. The stakeholder concluded that identifying the benefits of green roof deployment scenarios could be something to explore, and is what could be done with this application.

3.3 Healthy Cities: Health, Thermal Comfort and Air-quality

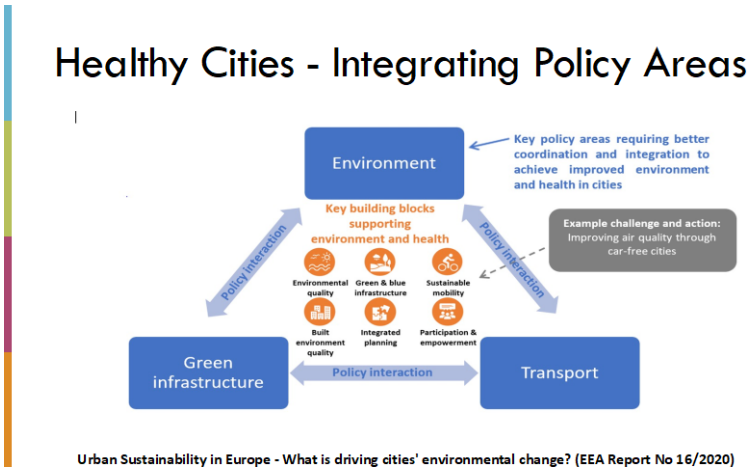
3.3.1 Policy Overview

One of the best overall 'indicators' of a healthy city is its air quality. Air pollution levels are typically low in well-planned cities with good transport systems, walkable streets and ample green spaces. In contrast, air pollution levels soar in urban settings that prioritise road transport over pedestrians and cyclists and that allow uncontrolled sprawl. CURE applications address these critical issues including the urban air quality app, which in combination with the specific cross-cutting health impacts and thermal comfort apps support the creation of healthy cities, where air quality remains below critical levels and where health promoting aspects, such as walkability, bike-ability and access to green areas are prioritised in urban planning. Planning for healthy cities requires the coordination of policy and action in a range of policy areas that can contribute to environment and human health improvement in cities. Policies prioritise both the health of people and the quality of environment recognising the many potential co-benefits between improving environmental quality and benefits for human health are intrinsically related, and should be considered together. Accordingly, this nexus focusses on the need for coordinated policy related to transport, green infrastructure and environment (Slide 27).

Policy responses and interventions to deliver healthy cities outcomes can be realised through the introduction of policies that reduce car use and traffic and promote active transport e.g. improved frequency and availability of public transport, subsidised public transport and incentives for cyclists, reducing speeds, restricting access and reallocating road space, to reduce air and noise pollution. Promoting teleworking and flexible working can also play a role by reducing the number of people commuting to work overall or during certain periods of the day. To some extent this has already taken place due to the Covid-19 pandemic as more people are working from home out of choice or following national or local guidance. A shift to active transport can have a range of co-benefits, contributing to improved health and reduced noise, as well as emissions of air pollutants and GHG.

These issues concerning healthy cities were outlined in the Demonstration Workshop (Slides 28 and 29), forming the basis for questions supporting stakeholder dialogue engagement in the workshop (Slide 30).

Slide 27



Slide 28

Healthy Cities - Policy Co-benefits

- One of the best overall 'indicators' of a healthy city is its air quality. But unsustainable transport patterns and behaviours are common, including the dominance of motorised transport, especially cars, and air pollution levels soar in cities that prioritise road transport over pedestrians and cyclists.
- Improving environment and health in European cities is a multi-dimensional challenge and priorities for human health focus attention on coordinated policy related to transport, green infrastructure and the environment. A shift to active transport can contribute to improved health and reduced noise, emissions of air pollutants as well as GHG emissions.
- Policies must prioritise both the health of people and the quality of environment. Policy actions taken to improve human health in cities, for example, can also create a range of co-benefits as green infrastructure contributes to climate resilience e.g. by incorporating flood management.

Slide 29

Healthy Cities - Planning Strategy Responses

Reducing Car Use and Promoting Active Travel

- Reducing city car use and promoting active travel can be achieved, for example, redesigning urban public and open spaces to improve green infrastructure and prioritising multiple uses and multifunctionality. Cities can implement these actions as part of their green recovery from the pandemic as part of a 15 minute city strategy.
- This can be realised through policies reducing car use and traffic and promoting active transport e.g. improved frequency and availability of public transport, and incentives for cyclists, reducing speeds, restricting access to reduce air and noise pollution.

Promoting Teleworking

- Promoting teleworking and flexible working can also play a role by reducing commuting to work overall or during certain periods of the day. To some extent this has already taken place following the Covid-19 pandemic as more people are working from home out of choice or following national or local guidance.

Slide 30

Healthy Cities - Engagement Questions

- What healthy cities policies/strategies are you aware of where CURE health, thermal comfort and air quality apps can offer distinct added value in securing enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that might inhibit the usability of the CURE apps, and which can form the basis for further CURE development processes?
- What priority do you give for air quality awareness raising measures – is it air quality maps identifying city problems areas, documentation of health costs due to poor air quality, e.g. mortality, number of sickness days, impact on small children, increasing number of people suffering from asthma, etc., or another information type?
- What is the potential added value of CURE health, thermal comfort and air quality apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?

3.3.2 Stakeholder Dialogue

Stakeholder dialogue in the healthy cities session addressed both detailed specification of the capabilities of the CURE apps, particularly in relation to existing city data and modelling, whilst also emphasising broad support for the relevance of the interlinked cross-cutting applications. Stakeholders also continued with extensive discussion of the various city related challenges for the development of the CURE apps.

App questions / Capabilities

Question 4: A number of app and modelling related questions arose from the demonstration of the Healthy Cities apps in the third session. These included whether the CURE GIS layers are available to overlap with existing city data and whether the CURE modelling was validated and compatible with existing city models and compliant with EU modelling requirements. The CURE project team responded that they would provide the CURE GIS maps for CURE cities, and that there was existing evidence and validation of CURE models for cities, with CURE modelling being compliant with cities and EU.

Relevance of Healthy Cities Theme/Apps for Cities

Comment 21: Consensus was provided for linking the Health, Thermal Comfort and Air Quality apps to the theme of Healthy CIties, with specific interest expressed and relevance for the CURE air quality map.

"We're really interested in this theme, about healthy cities, and how we can measure the health of the citizens and how we can provide better life, which will make healthier people. We are really interested in the results of the air quality map. In our opinion it's directly connected with the urban heat risk and the measurements that we make to reduce the urban heat island" (Stakeholder).

Comment 22: There was also agreement of the usefulness of the Health, Thermal Comfort and Air Quality apps for Healthy Cities for a number of reasons. One stakeholder explained that the CURE apps provided the opportunity to change the messages put out by cities and would be good for providing evidence for changing mindsets and behaviour.

"I think it's a very good tool. Especially because there's going to be a necessary change of mentality towards traffic. In our case, sometimes it's very difficult to convince citizens. We are going to implement laws. But you still have to do some convincing and it's difficult if you talk about climate change and sustainability. It's not so difficult if you talk about health. So, I think there's a good opportunity in that" (Stakeholder).

Comment 23: One stakeholder said that the apps provided the opportunity to compare city data with CURE data and to develop city indicators/targets, and so expressed the view that overall the Healthy Cities apps offer great potentials. Another stakeholder voiced that the Healthy Cities apps could be used as a tool to operationalize data for citizen engagement and behaviour change.

"(…) to give an understanding to cities how actually to use this tool as a way to engage with its citizens. Use it as a climate plan, perspective and trajectory road map and so on. I think that it is really important for air quality to be used" (Stakeholder).

An example of how this could happen was that data from this city shows that there is more pollution inside cars on highways and motorways than on city streets. But this pollution evidence is not being

used in the right way to target streets with actual problem. Therefore, this messaging needs to be publicised.

Comment 24: One stakeholder suggested there was the possibility of using the CURE satellite data for updating city climate model. Another stakeholder described that there was overlap of the Healthy Cities theme with the other themes discussed in the workshop, although no specific details were given.

Challenges for CURE app Developers

The Healthy Cities stakeholder dialogue resulted in a number of challenges for CURE app developers to consider across different areas. These areas included Issues from Existing Research; CURE Project Data Implementation; Working with City Administrations; Translating Data into Behaviour Change; and Overcoming Administration Challenges.

- Issues from Existing Research

Comment 25: One stakeholder explained how there are problems with the ways air quality is measured at the European Framework level. They explained how motorways are not included in modelling, yet they have the highest levels of pollution, which is greatest during the morning and afternoon rush hours. They explained that these pollution levels can be five times higher than those of city streets and ten times higher than those of city residential streets. Another stakeholder agreed and stated that evidence from the United Kingdom's National Health Service has found that air quality inside cars is 25-700% worser than outside cars, depending on air conditioning / windows open or closed, and that pollution is six to seven times higher during rush hour than annual averages. As a result pollution is more a suburban than an urban problem.

"there is a lot of new research going on that it is hyper local, and it's time sensitive, and it's also looking at what is the car exposure. And that I think is one of the clues that we need to get in people's heads. That this is actually not an urban problem. This is a suburban problem in that perspective (Stakeholder).

- CURE Project Data Implementation

Comment 26: One significant challenge expressed by a number of stakeholders' is how to convince the local authority or municipality that the CURE data is sound and of benefit, or better than existing city data. For example, one stakeholder explained how their city's official modelling data is incorrect, meaning that the incorrect data is being used to provide evidence, resulting in unrealistic and untargeted measures. They gave specific city examples of data discrepancies whereby official modelling showed low emissions, and modelling provided by a NGO showed higher emissions. The stakeholder expanded on the effects of the city's incorrect modelling, which resulted in unrealistic measures that cannot be targeted, and was of the opinion that the official modelling was unsuitable for urban planning.

Comment 27: However, a stakeholder from another city had a different challenge. They explained how their city has very detailed data, to the extent that colleagues within the local authority cannot see benefits of CURE data. However, the stakeholder's view was that combining existing city data and CURE modelling data would offer good city estimations.

- Working with City Administrations

Comment 28: One stakeholder described that in their city there was the 'strange situation' where the city had data tools and measurements, hyper local maps, and was compliant with regulations, yet still had high air quality related deaths. Leading him to conclude that the city is unable to calculate related

difficulties or danger. Additionally, he explained that interest and the appetite for change is varied across different groups. Politicians and citizens are interested, whereas the city administration is not using decision-making support tools, and does not know how to engage with them. The explanation is that administrations do not want to undermine the implementation of existing measures. One example given was that evidence of poor road air quality would put people off cycling as installing bike lanes on polluted streets was the current preferred option. They also explained that whilst using new tools to support low emission zones has a strong political will, this also needs administrative compliance.

- Translating Data into Behaviour Change

Comment 29: One city stakeholder emphasized the challenge of how to translate evidence from data into action for citizen behaviour change. They explained that in their city there were clear differences of behaviour across city neighbourhoods. For example, "green behaviours" in one neighbourhood and multiple car users in another.

"The problem is you have to implement plans and measurement data. (…) I think we know enough about which direction it should go for a healthy city. The reality is that the public does not have the same view of the problem" (Stakeholder).

- Overcoming Administration Challenges

Comment 30: One stakeholder provided an example of how working across urban planning and air quality departments within their local authority had proved invaluable when tackling air quality in the city. They explained that this was done through intensive air quality training for planning officers from air quality officers and external trainers.

"there was quite a lot of will to resolve a specific set of issues, we broke down the silos and started to work much more closely, not just on that project, but sharing more in the long term" (Stakeholder).

4. CONCLUSION AND NEXT STEPS

The CURE 1st Demonstration Workshop provided a highly effective platform for engagement with a broad range of high-level CURE stakeholders, including city planners, developers and scientific communities to engage in dialogue on the usability of the CURE cross-cutting apps in responding to urban resilience challenges. The Demonstration Workshop discussion extending over half a working day (4.5 hours) involving more than 50 stakeholders, generating a rich and diverse range of views regarding the prime challenges for cities and their resolution. In particular views expressed in relation to the 3 CURE themes of climate change mitigation and adaptation as well as healthy cities provided deep insights into the nature of the challenges facing cities in pursuing these policy objectives, and the various ways in which CURE apps can most effectively contribute to the delivery of integrated policy strategy solutions.

Positive affirmation of the user need for the full range of CURE apps was generated by stakeholder dialogue across all 3 themes of engagement. For climate change mitigation and adaptation efforts to develop and deliver mitigation and adaptation plans were identified as “greatly undermined” by gaps in the available data including transport and traffic flows inhibiting calculations of CO_2 emissions. Similarly, for flood risk, flood risk analysis was viewed as challenging as "more detailed analysis of flood risk and preventative measures effectiveness are required”. Also, for healthy cities the relevance of the CURE air quality map was emphasised, and “great potential” identified in linking city data with CURE data to develop indicators monitoring targets. Overall, the process of stakeholder feedback emphasised the value of the CURE process of ongoing stakeholder engagement in CURE application development as “urban planners and downstream services developers are fully aware of what data is needed”, highlighting the benefits in providing cities with the opportunity to work with the CURE apps and understand how they can best be integrated into the existing cities systems.

Beyond these issues concerning the integration potentials of CURE cross-cutting apps, stakeholders expressed wide-ranging views on the challenges they face in driving towards climate neutral and healthy cities including issues concerning cities’ structure and organisation. This highlighted the frequent disconnect between urban planning and other departments promoting poor intelligence. But also emphasizing the opportunity for CURE cross-cutting apps to bridge these departmental divides. Equally, opportunities for novel CURE apps were identified in relation to post pandemic “new normal” planning challenges evident in shifting preferences for work and home locations, as well as more general re-evaluation of urban living. These “new normal” socio-economic transformations and their spatial implications in terms of city planning identify opportunities to develop CURE apps beyond decision support tools to more broadly address citizen and stakeholder awareness-raising and behavioural change, and support the promotion, for example, of nature-based solutions for climate friendly and healthy city mobility options including active travel, cycling and walking.

Going forward by the end of 2021 CURE aims to secure the completion of the CURE cross-cutting apps and development of the CURE system paving the way for the further evaluation and integration of the CURE cross-cutting apps during the first part of 2022. During the autumn 2022 the 2nd Demonstration Workshop will be held with full system demonstration and integration of all CURE apps together with assessment of wider replication potentials, involving engagement of the CURE apps with follower cities. This evaluation of the proof of concept and prototypes will provide insights about the effectiveness of the apps for various user communities to form the basis for guidelines on ways CURE can support the future development of downstream services, focusing on sustainable and resilient urban planning delivering climate neutral, climate adaptable and healthy cities. The Demonstration and Evaluation Final Report will be published in December 2022 at the end of the project.

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ANNEX 1: WORKSHOP INVITATION AND AGENDA

Invitation to the CURE 1st Demonstration Workshop

Herewith we invite you to the 1st Demonstration Workshop of the CURE project (Copernicus for Urban Resilience in Europe). The workshop takes place **online in the morning of Friday, 15th of October, 2021**.

Introduction to the CURE project

The CURE project develops cross-cutting applications among the Copernicus Services for urban resilience. A major challenge is the exploitation of the Copernicus products in dealing with the multidimensional nature of urban sustainability towards enhancing urban resilience. CURE synergistically exploits Copernicus Core Services and develops cross-cutting applications for urban resilience, which provide spatially disaggregated environmental information at local scale. CURE uses DIAS (Data and Information Access Services) for a system capable of supporting operational applications and downstream services across Europe in the future. CURE is expected to provide scenarios on how the developed system could potentially be integrated into the existing Copernicus service architecture addressing also its economic feasibility.

Workshop Objective

The main objective of this workshop is to demonstrate the range of capabilities of the 11 CURE cross-cutting applications in relation to city challenges, including climate change mitigation and adaptation, as well as the realization of healthy cities. You can watch introductory videos from the CURE cross-cutting applications via this link. Special emphasis will be given to the views of stakeholders (including city and developer communities) on the effectiveness of these applications.

Workshop Content

This workshop includes a welcome session (introducing the CURE project, CURE user requirements perspectives, and the workshop context), three thematic sessions (presenting the CURE cross-cutting applications, discussing about their capabilities and getting feedback about their effectiveness), and a closing session (investigating post-covid urban planning requirements and presenting CURE project next steps).

We look forward to seeing you in the workshop.

Kind regards,

Nektarios Chrysoulakis, FORTH

David Ludlow, UWE

For more information about the project you can visit/follow its website, social media and repository:

http://cure-copernicus.eu | CURE - Copernicus for Urban Resilience in Europe | @H2020Cure

CURE H2020 Project | CURE - Copernicus for Urban Resilience in Europe | CURE H2020 Project

Copernicus for Urban Resilience in Europe

Funded by the European Union

CURE

1st Demonstration Workshop Agenda

online via MS Teams (click here to join) - Before joining the workshop, please read and accept the consent form via this link.

15 October 2021

Workshop Duration: 4.5 hours

Workshop Start Time: 09:00 (Bristol)
10:00 (Basel, Berlin, Copenhagen, Munich, Ostrava, San Sebastian, Vitoria-Gasteiz)
11:00 (Heraklion, Sofia)

Detailed Agenda (time is in CEST)

10:00 – 10:30	**Welcome Session**	
10.00 - 10.05	Housekeeping and Capturing the dialogues	Jo Bushell – UWE
10.05 - 10.20	Introduction - Welcome and CURE Overview	Nektarios Chrysoulakis – FORTH
10.20 - 10.30	CURE User Requirements Perspectives	David Ludlow – UWE
10:30 – 11:45	**Session 1 - Mitigation** - Heat and CO_2	
	Introduction to climate change mitigation	David Ludlow – UWE
	Heat and CO_2 CURE applications video – Q&A	Zina Mitraka – FORTH
	Dialogue engagement with participants	David Ludlow & Jo Bushell – UWE
11:45 – 12:15	***Break***	
12:15 – 13:15	**Session 2 - Adaptation** – Nature-Based Solutions and Flood/Subsidence	
	Introduction to climate change adaptation	David Ludlow – UWE
	Nature-Based Solutions and Flood/Subsidence CURE applications video – Q&A	Tomas Soukup – GISAT
	Dialogue engagement with participants	David Ludlow & Jo Bushell – UWE
13:15 – 14:15	**Session 3 - Healthy Cities** – Health, Thermal Comfort and Air Quality	
	Introduction to healthy cities	David Ludlow – UWE
	Health, Thermal Comfort and Air Quality CURE applications video – Q&A	Birgitte Holt-Andersen – CWare
	Dialogue engagement with participants	David Ludlow & Jo Bushell – UWE
14:15 – 14:30	**Closing Session**	
	Mentimeter Challenge - post-covid urban planning requirements	All
	Next Steps and Close	David Ludlow – UWE

ANNEX 2: PARTICIPANT INFORMATION SHEET

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http://www.cure-copernicus.eu/

CURE 1st Demonstration Workshop

Participant Information Sheet

You are invited to take part in the Copernicus for Urban Resilience in Europe (CURE): CURE 1st Demonstration Workshop (online) as part of the research taking place in the H2020 Copernicus for Urban Resilience in Europe (CURE) project. In anticipation of your participation, it is important for you to understand why the study is being done and what it will involve. Please read the following information carefully and if you have any queries or would like more information please contact David Ludlow, Faculty of Environment and Technology, University of the West of England, Bristol at David.Ludlow@uwe.ac.uk.

Who is organising and funding the research?

The CURE project (http://www.cure-copernicus.eu/) is funded by the European Commission under Horizon 2020 programme – Grant # 870337. The CURE consortium has 10 partners from 9 countries and it is led by Nektarios Chrysoulakis from IDRYMA TECHNOLOGIAS KAI EREVNAS (FORTH), Greece. David Ludlow and Jo Bushell from the University of the West of England, Bristol are leading the stakeholder demonstration and evaluation.

What is the aim of the research?

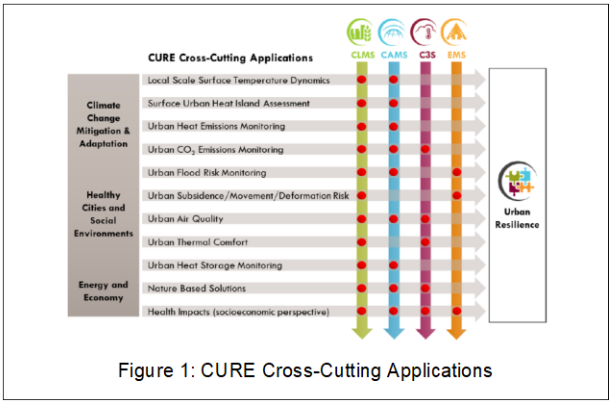

Figure 1: CURE Cross-Cutting Applications

The CURE project aims to develop 11 applications in the domain of urban sustainability, mainly for the themes of climate change adaptation/mitigation, energy and economy and healthy cities and social environments as depicted in Figure 1. To meet this challenge, information from more than one Copernicus Core Service, namely the Land Monitoring Service (CLMS), the Atmosphere Monitoring Service (CAMS), the Climate Change Service (C3S) and the Emergency Management Service (EMS) as well as 3rd party data will be used. These applications will provide new decision-making support intelligence for urban planning based on Copernicus remote sensing data, so

effectively supporting strategies for resilience planning at local and city scales, towards the implementation of the Sustainable Development Goals and the New Urban Agenda for Europe.

The main research question to be addressed through the CURE 1st Demonstration Workshop (online) is: 'How useful is the information and data produced by the Copernicus based new cross-cutting applications in decision making for urban sustainability related challenges?'

To answer the above question a half-day online workshop will take place on Friday 15 October 2021. This workshop will provide detailed information about the CURE project as well as the CURE cross-cutting applications and engage in dialogue with focused groups of participants. The aim of the dialogue will be to collect information that can make the CURE applications more beneficial to its users. More specifically, the dialogues will result in identification of further needs and requirements for the implementation of the CURE applications. The information collected through the online workshop will be anonymized so it cannot be attributed to any individual.

As this is a university research project, we also need to inform workshop participants that the workshop will be recorded in two ways: through audio and video recording via the online meeting and in various written forms to produce CURE project research data. During the online workshop we will also take a few screengrab photos for use in our research communication and dissemination activities.

We anticipate that most of the information gathered during the workshop dialogues will be collective. Nevertheless, any individuals who are referred to during the workshop will be anonymised in the evaluation and analysis process. However, the field of expertise of participating individuals (e.g. app developer or urban planner) will be important to know in the workshop evaluation and will be asked for in the follow up workshop questionnaire. However, this information will be known only to the CURE researchers for evaluation purposes and will not be shared with anyone outside of the research team.

Participants can choose to withdraw from the research process at any time. However, due to the collective nature of the information produced during the dialogues, information provided will not be able to be removed from the study, unless it is clearly identifiable as pertaining to the individual concerned. An announcement at the start of the workshop will inform participants that the recording will take place and for any participants who do not wish to be video recorded to turn off their cameras so they can be omitted from the video recording and photographs.

The results of the workshop data will be analysed and reported via project Deliverable, D5.2 – Users' Feedback on Demonstrations, that will be a public deliverable available from the project website. The anonymised results may also be used in conference papers and peer-reviewed academic papers and presentations.

Why have I been invited to take part?

You are invited as a professional and/or potential user of the selected CURE applications to contribute your experience, views and/or application specific requirements at the CURE 1st Demonstration Workshop (online).

V.2, Professor David Ludlow, 5 October 2021

UWE Bristol University of the West of England

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, **please give your consent via the link in the email** regarding the use of the information that you provide. As data collected during the workshop will be anonymised and no longer be personally attributable, participants cannot withdraw from the research after the workshop.

What will happen to me if I take part and what do I have to do?

You will be taking part in online dialogues during the CURE 1st Demonstration Workshop (online) organised by UWE, Bristol on Friday 15th October 2021. CURE project team are all experienced in the subject matter and any of the issues that may arise. The format of the workshop is:

1. Workshop Start – 10:00 CEST on Friday 15 October 2021. The workshop will be hosted using MSTeams via a secure link, which is included in this email invitation. The workshop will begin with welcome, some housekeeping and a brief project introduction by the CURE project coordinator.

   The remainder of the online workshop will be divided into presentation, discussion and feedback sessions to assess the integration of the 11 applications according to the following applications schema:

   - **Mitigation** - Heat and CO2 Session
   - **Adaptation –** Nature Based Solutions and Flood/Subsidence Session
   - **Healthy Cities** – Health, Heat and Air Quality Session

   Please see attached agenda for further details.

2. Each session will begin by setting framing conditions by introducing the CURE applications via video presentations (by project partners) and then followed by online discussions (project partners, participants of the workshop). UWE, together with project partners, will run these discussions and assess the suitability of presented applications and gain insights and views from the participants as per the User Stories in the Topic Guide. Written notes will be made as necessary to gain participants views and needs for the integration of the CURE applications. UWE staff will analyse these views and user needs to write D5.2 (see point 3 below).

3. These discussions will be anonymised to all individual participants and hence it will not be possible to remove them from the workshop consolidated report and later from scientific publications.

4. For dissemination and publicity of the workshop, photographs e.g., a screengrab photo may be taken during the workshop. If this is of concern to you then please let the workshop organisers (e.g., David Ludlow) know prior to the workshop.

5. The workshop will end at 14:30 CEST on Friday 15 October.

What are the benefits of taking part?

The project directly addresses the urgent need for enhanced planning decision making support, to be attained via intelligence, tools and methodologies that meet the challenges of urban sustainability challenges. Your participation will assist in gaining understanding of stakeholder requirements via their evaluation of the CURE Copernicus applications to be applied across European cities.

V.2, Professor David Ludlow, 5 October 2021

UWE Bristol University of the West of England

What are the possible risks of taking part?

We do not foresee or anticipate any risk to you in taking part in the CURE 1st Demonstration Workshop (online). The research team are experienced in both conducting stakeholder workshop activities as well as the subject area. The workshop has been designed with these considerations in mind.

What will happen to your information?

All information provided will remain confidential and anonymised during the discussions. The anonymised data will be analysed and outcomes will be documented. Hard copy research material will be secured as per the University's Data security provisions as well as the Data Protection Act 2018 and General Data Protection Regulation requirements. The hard copy research material will be securely destroyed by the end of the project i.e. December 2022.

Where will the results of the research study be published?

A report will be written containing the research findings as CURE project deliverable D5.2 – Users' Feedback on Demonstrations. Once approved by the European Commission, this deliverable will be publicly available from the CURE project website. Also, journal/conference papers informed by findings of the research detailed above are anticipated. Anonymous and non-identifiable direct quotes may be used for publication and presentation purposes.

Who has ethically approved this research?

This CURE 1st Demonstration Workshop (online) has been provided with ethics consent by the FET Faculty Research Ethics Committee.

What if something goes wrong? Or What if I have more questions or do not understand something?

If you have any concerns, queries or would like any further information about the CURE research project please contact in the first instance:

CURE Research Associate: Jo Bushell, University of the West of England, Coldharbour Lane, BS16 1QY, Bristol, United Kingdom Email: joanna2.bushell@uwe.ac.uk; Tel: +44 (0)117 328 4264; Mobile: +44 (0)7434 605134.

V.2, Professor David Ludlow, 5 October 2021

ANNEX 3: FOLLOW-UP QUESTIONNAIRE

CURE

1st Demonstration Workshop
Follow-up Questionnaire

Climate Change Mitigation - Heat and CO2

- What policies/strategies do you have in your city where CURE apps can offer distinct added value in promoting enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that might inhibit the usability of the CURE apps, and which can form the basis for further CURE app development?
- What priority co-benefit linkages to other policy fields can support additional CURE app development e.g. linking greenhouse gas emissions and urban warming to urban transport in addressing climate change mitigation and carbon neutral cities policy challenges?
- What is the potential added value of CURE apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?

Climate Change Adaptation – Nature Based Solutions and Flood/Subsidence

- What policies/strategies do you have in your city where CURE apps can offer distinct added value in promoting enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that might inhibit the usability of the CURE apps, and which can form the basis for further CURE app development?
- What priority co-benefit linkages to other policy fields can support additional CURE app development e.g. linking greenhouse gas emissions and urban warming to urban transport in addressing climate change mitigation and carbon neutral cities policy challenges?
- What is the potential added value of CURE apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?

Healthy Cities – Health, Thermal Comfort and Air Quality

- What policies/strategies do you have in your city where CURE apps can offer distinct added value in promoting enhanced intelligence to support improved decision-making?
- What are the potential gaps and limitations that might inhibit the usability of the CURE apps, and which can form the basis for further CURE app development?
- What priority co-benefit linkages to other policy fields can support additional CURE app development e.g. linking greenhouse gas emissions and urban warming to urban transport in addressing climate change mitigation and carbon neutral cities policy challenges?
- What is the potential added value of CURE apps, if integrated to the operational Copernicus Services Portfolio, supporting downstream services development for cities?