

# User Engagement in the CLIM4cities Project



Event: Climate Coffee  
Date: September 12, 2024



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# The Team



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DMI



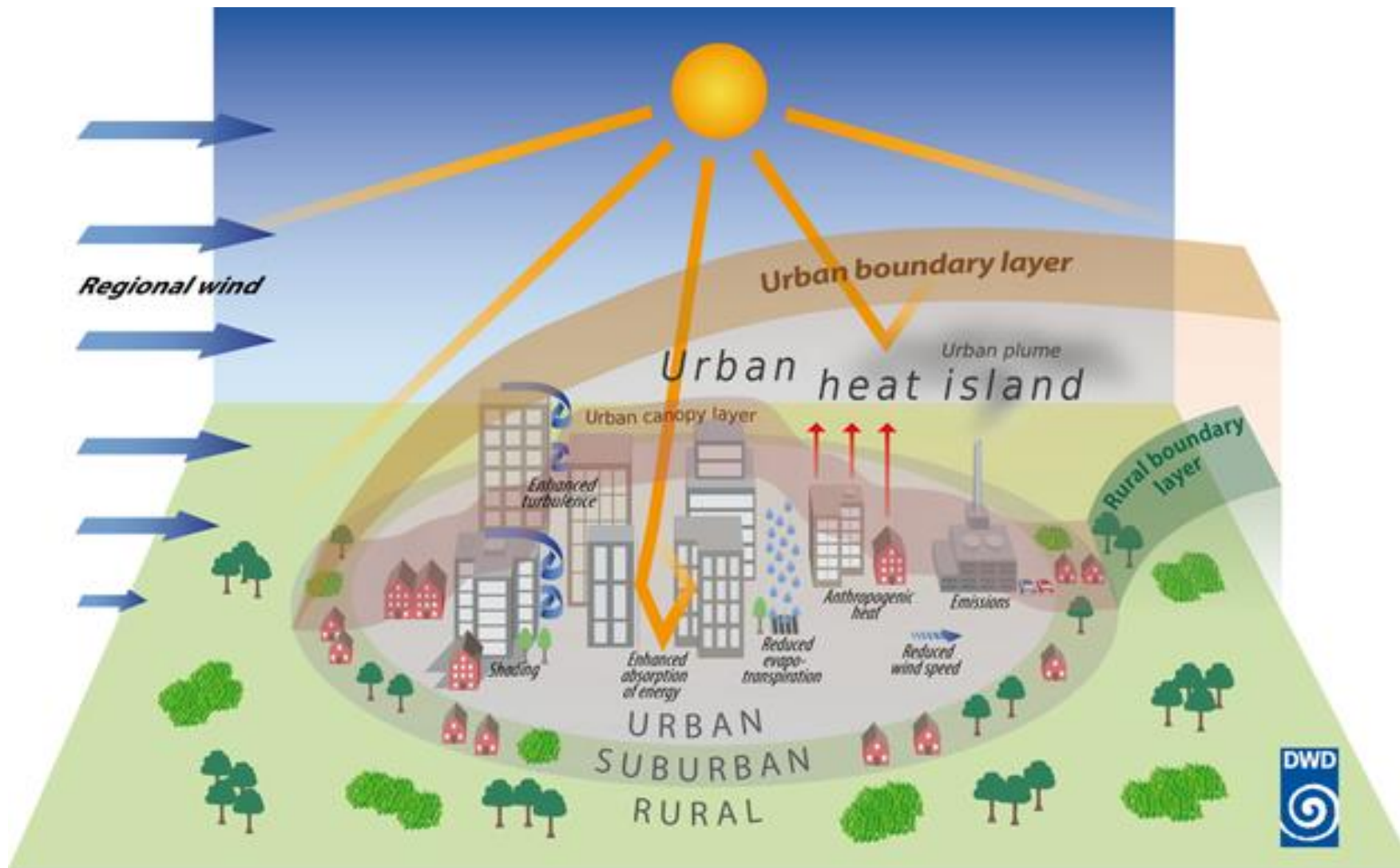
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Source: [https://www.dwd.de/EN/research/climateenvironment/climate\\_impact/urbanism/urban\\_heat\\_island/urbanheatisland\\_node.html](https://www.dwd.de/EN/research/climateenvironment/climate_impact/urbanism/urban_heat_island/urbanheatisland_node.html)



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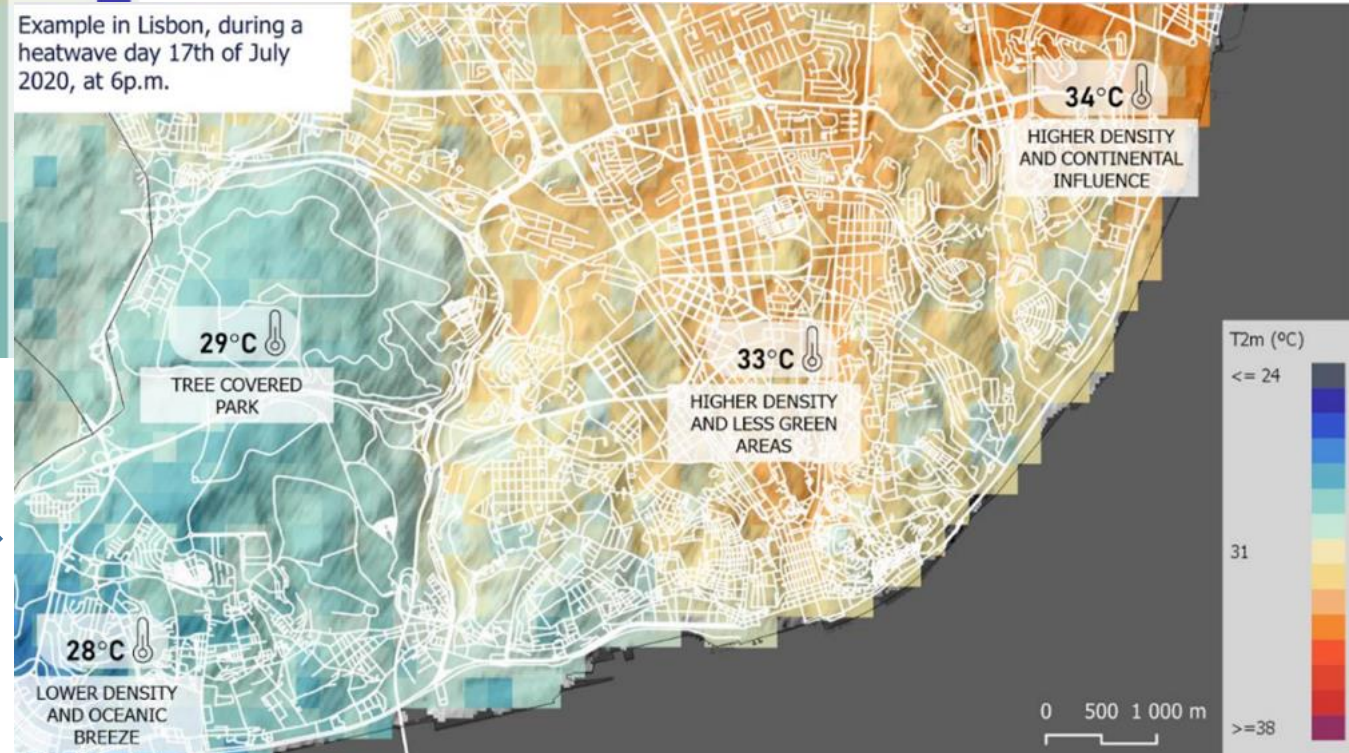
Example in Lisbon, during a heatwave day 17th of July 2020, at 6p.m.



← Estimated from satellite data

T2m (°C)  
<= 24

Example in Lisbon, during a heatwave day 17th of July 2020, at 6p.m.

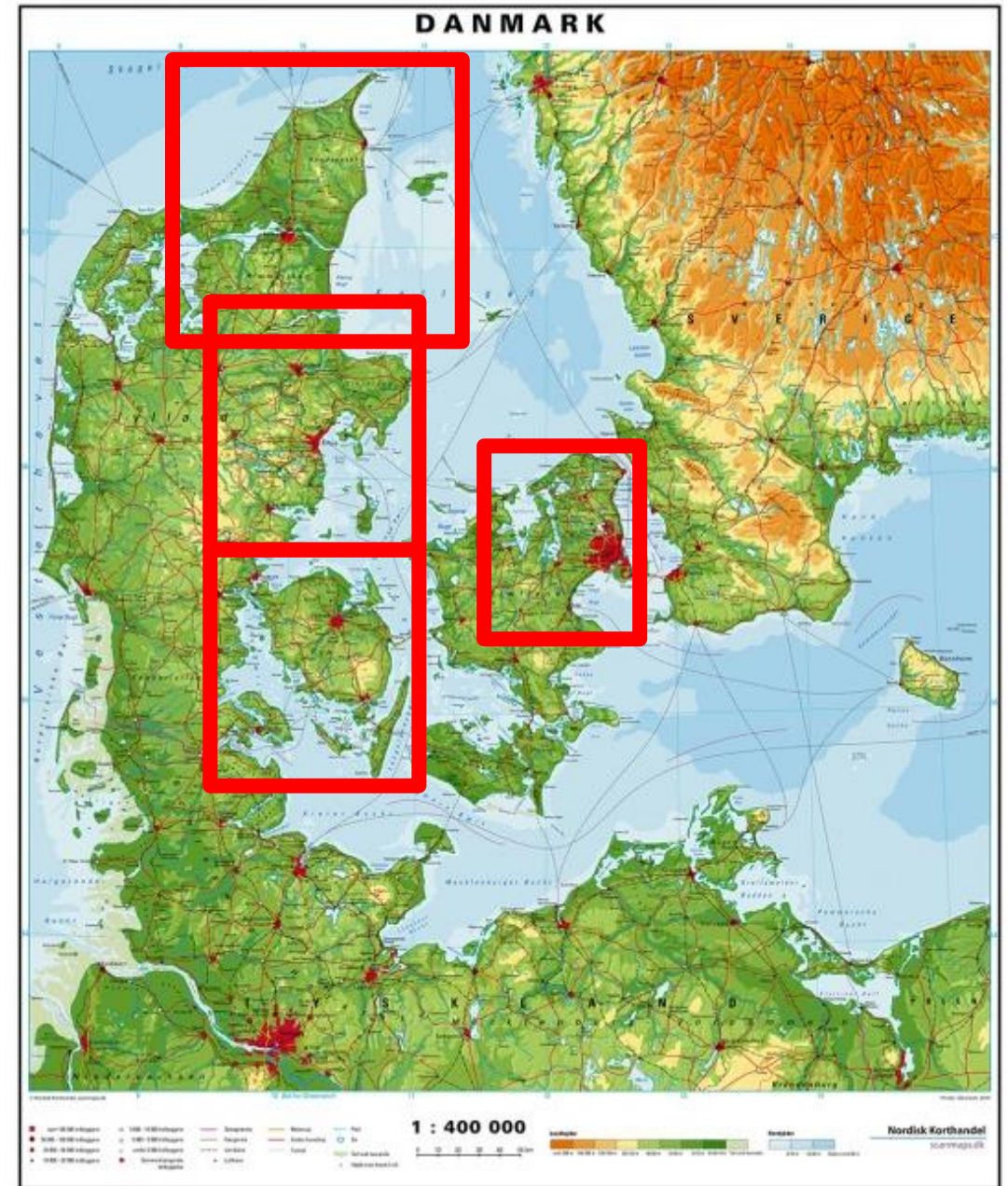


→ ML model

# Product of the project

- UHI Product for the four largest Danish cities
- A methodology for generation of similar data for similar climate and input
- Exactly how the end-product should look like was open for discussion from the beginning of the project

Source: <https://www.scanmaps.dk/0000745>



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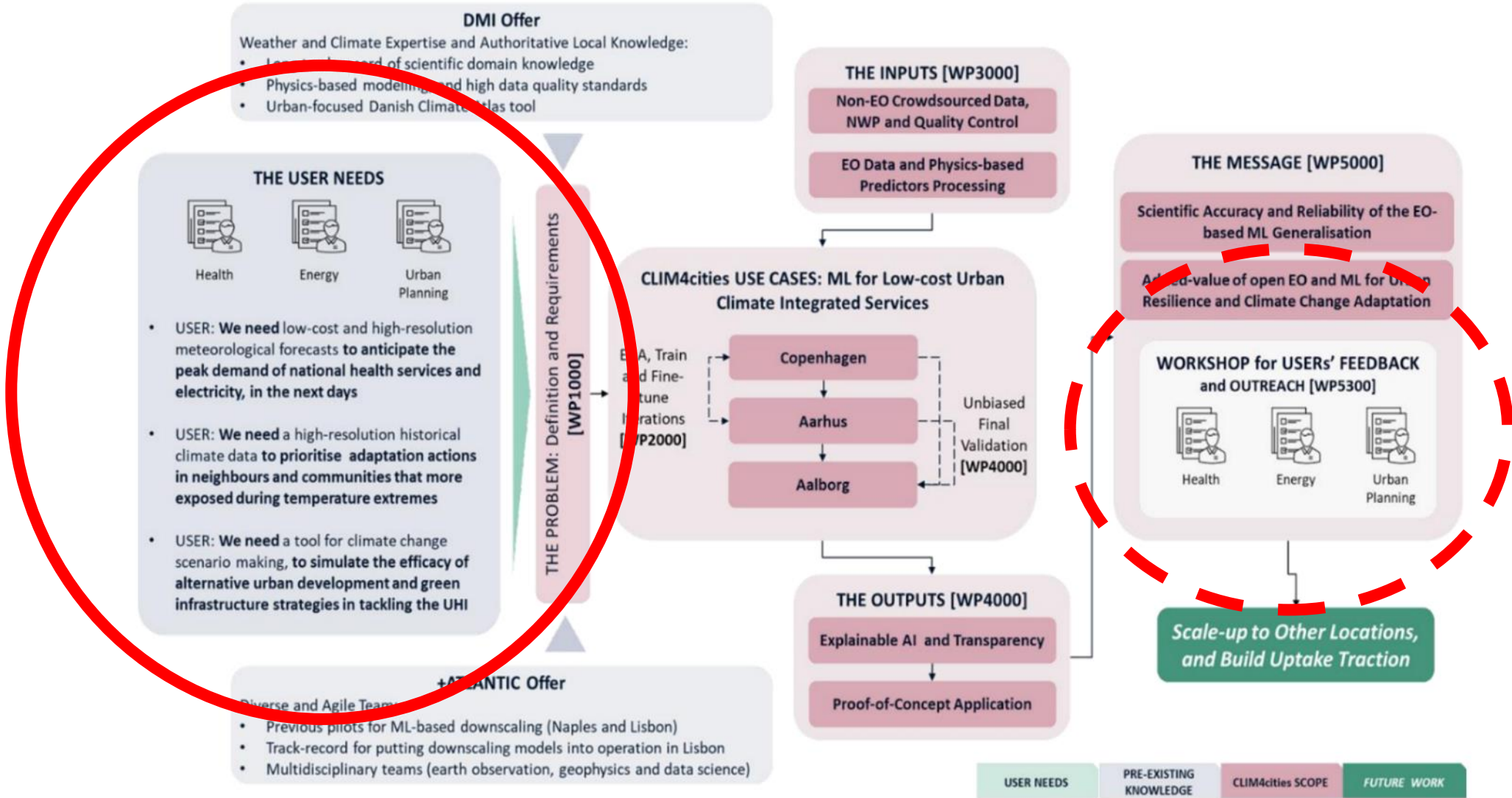


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# User Engagement: Be Aware of the Goal

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- Why are we engaging with the users?
- What do we need to get out the engagement?
- What can actually be altered in the project based on the user engagement?



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# User Engagement: Workshops

Photo: Mark R. Payne

**Get the right people in the room!**



- Municipal planners
- Regional planners
- Researchers
- Environmental Protection Agency
- A green think tank



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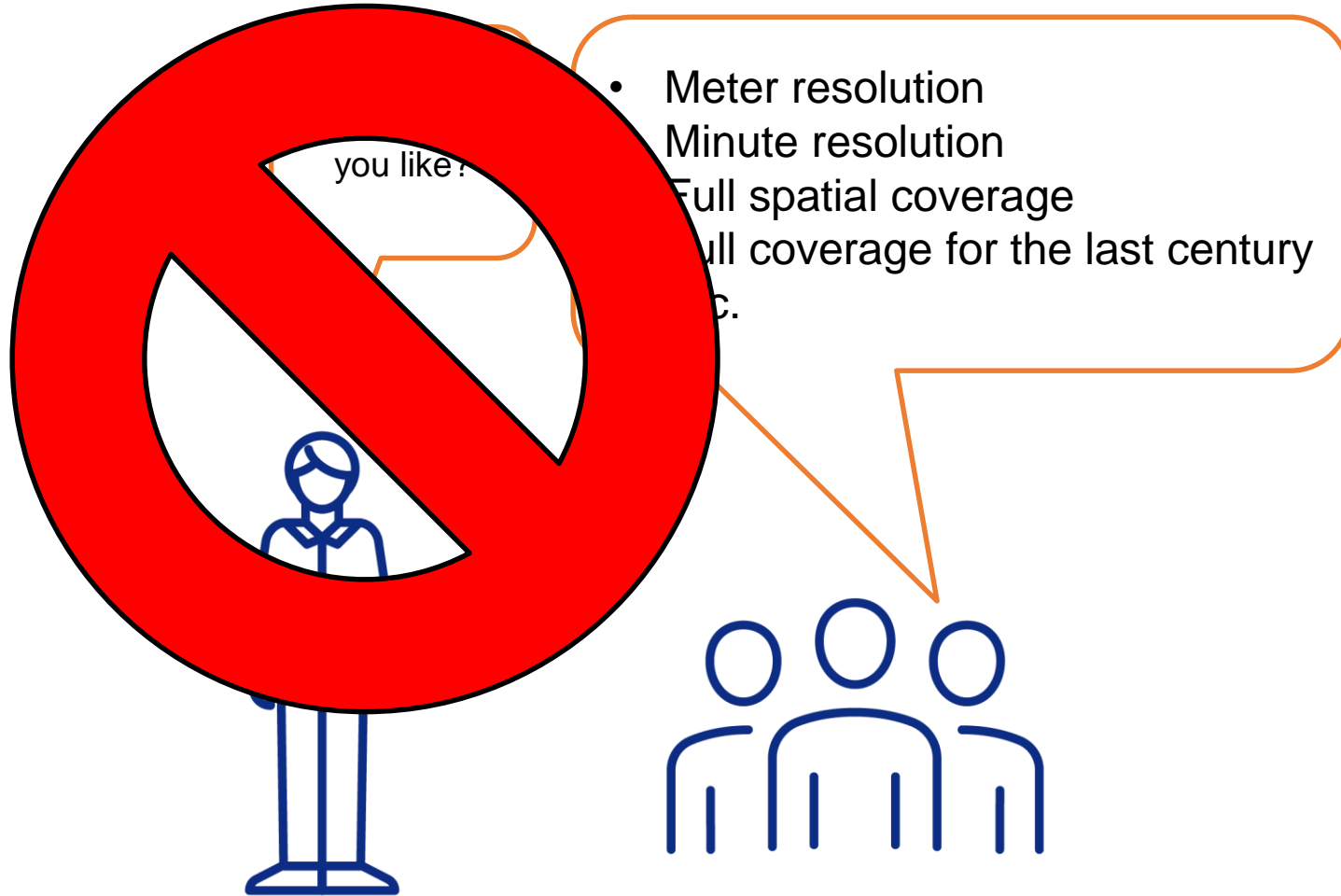
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# User Engagement: User Needs





# User Engagement: User Needs

How would you work with this problem?

True reflections on **data needs**, and **capabilities** with respect to managing and utilizing data





# Group assignment

- Description of climate information need
- In my role as...
  - Who will be working with data?
- I need information on...
  - Which data is actually needed!
- To do....
  - What is the goal the data will be part of achieving?  
and how to achieve that goal?

## Beskrivelse af klimainformationsbehov

### I min rolle som...

Hvem er det som kommer til at bruge informationen i deres arbejde?

### har jeg brug for klimainformation om....

Beskriv klimainformationen, produkterne og indikatorerne som du har brug for:

### for at....

Hvilke beslutninger bliver informeret eller påvirket af informationen?

### Evt. bemærkninger...

Hvordan skal data formidles? Opløsning? Format? Andre detaljer?

### Evt. kontaktdetaljer...

Må vi kontakte dig for yderligere opfølgning? Hvis ja, skriv dit navn, firma / kommune, e-mail og arbejdstelefon her:





- The user engagement workshops and dialogues clearly manifest a demand for better high-resolution UHI models, and demonstrate a mature environment able to utilize such data in relevant planning and operations if provided.

Role	Expressed needs	Possible implications for CLIM4cities
Municipal planner	There is a strong wish to have UHI data for present and future conditions available for planning in as high a spatial resolution as is technically possible. Planning data is generally available at cadastre level resolution in Denmark, and the municipalities therefore have skills and procedures in place to be able to work with information at that level of detail.	UHI output maps have to be produced in as high spatial resolution as possible.  Focus on maximum expected temperature as well as maximum UHI effect
Municipal planner	As other information is available at very high spatial resolution, there is a strong need for a breakdown of the model results, in order for the end-users to be able to understand which parts of the underlying city morphology that causes pixel-to-pixel differences. This will be a strong tool for practitioners when differences between apparently similar areas are detected, and mitigation efforts are to be designed.	The level of detail of the documentation of the ML model used for the UHI downscaling has to be high. Further, distinctions between input variables have to be explicit and well described.
Municipal planner, regional planner	Focus at the municipal level is very much on mitigation, and for that purpose, there is a strong wish to have access to the ML model, and use it for running scenarios with potential land use changes reflecting possible mitigation efforts through e.g. Nature-Based Solutions, as well as the expected effects of urban development, densification and sprawl.	A version of the ML model that can easily be rerun with altered input data in the form of GIS layers representing the urban morphology.
Municipal planner, regional planner	In line with the above need, a catalogue of the expected effects on UHI of possible mitigation efforts is sought after as a planning tool.	Is beyond CLIM4cities and the purpose of DMI, but could potentially be built using the ML model by others.
Emergency management at all levels	An operational UHI warning system where authorities with a few days lead-time can react to the extra effect of UHI in HW situations. Here, the wish is to be able to map out better which areas people should avoid due to extreme heat, and where in the cities people can go to experience the coolest conditions.	Is potentially beyond CLIM4cities, but could be forwarded to the relevant part of DMI for further development as soon as we have a good idea about the UHI effects in Denmark. Could build on the ML models from CLIM4cities.
Regional climate adaptation coordinator	Perspectives beyond the pure urban municipalities. Especially the question of how small cities can expect to have an UHI effect.	Is beyond CLIM4cities, but the developed ML model can be used by DMI afterwards on more, smaller, Danish cities in order to be able to map out which size cities should have in order to have a distinct UHI effect that should be dealt with in planning situations.
Regional health authorities, health impact research	During HWs, excess deaths are reported, and the causes of those are a mixture of personal vulnerability and heat related effects. The personal vulnerability is quite well understood and described in the Danish context, but the heat exposure related risk would benefit from high resolution spatial data on UHI.	UHI output maps have to be produced in as high spatial resolution as possible, and actually the need is for even higher resolution than what is expected to be possible within CLIM4cities.



- **Resolution:** The UHI data products can be adopted and processed at the highest spatial resolution available
- **Data format:** The main recipients for the initial UHI datasets are the planning bodies of the municipalities; they work with GIS data
- **ML model:** The model should be documented to a degree so end-users can pick it up and use it for scenario analyses
- **Coverage:** The project only covers the four largest cities in Denmark. There is a clear wish for an assessment of how small cities can be expected to have an UHI effect and thus, a wish for a data product that covers more and smaller cities than the ones included



# Conclusion

1. Be very aware about what you want to get out of your engagement with the users
2. Talk to the right people
3. Ask the right questions
4. Synthesize the results so they align with point 1 above
5. Be open to conclusions you cannot meet in your project – they can be a vehicle for future projects, as you can demonstrate a need

Source: <https://www.scanmaps.dk/0000745>



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# Questions?



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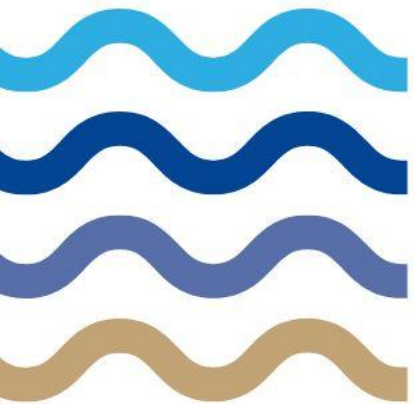
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# Climate Coffee



**Ana Oliveira**

**AI for Urban Climate: An EO-Based  
Approach for Heatwaves Exposure and  
Adaptation – CLIM4cities project**

17 October 2024 | 10:00 - 10:40 CEST  
Online



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