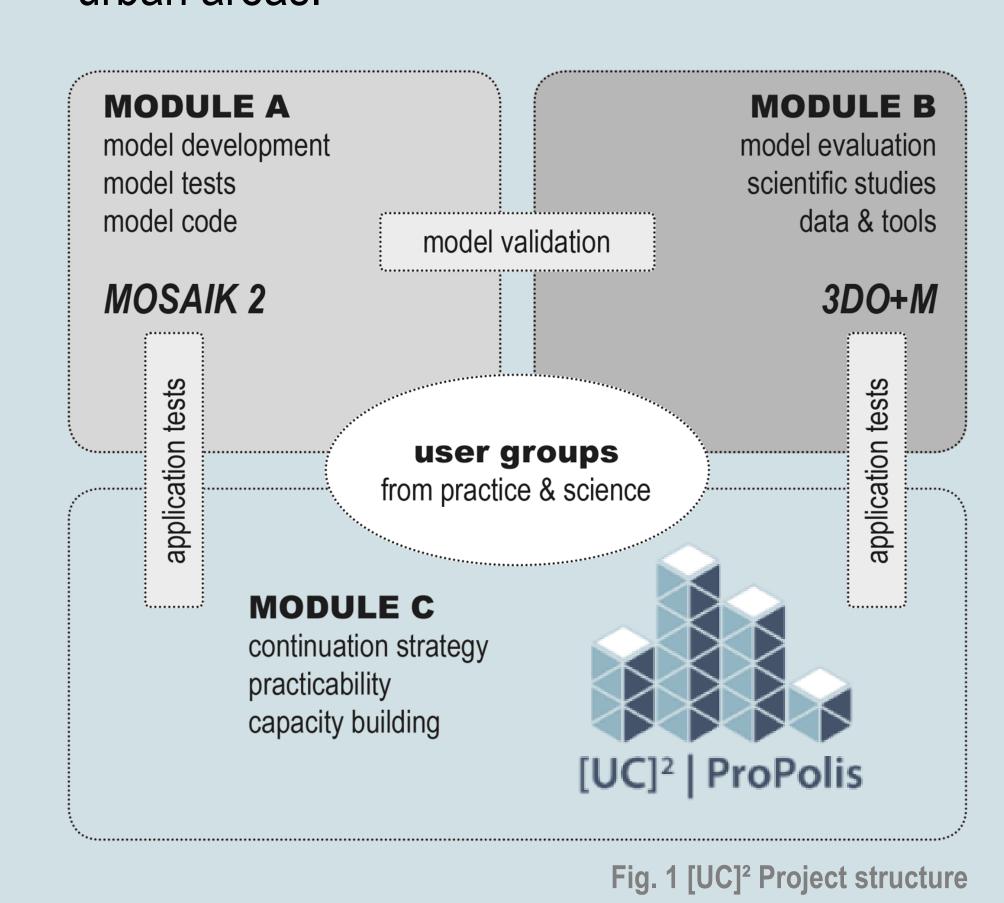
### SCIENCE

Worldwide cities contribute to the rapid climate change with growing greenhouse emissions. At the same time, they are sensitive to impacts of climate change, such as heat waves, extreme rain events, heavy storms or increased air pollution.

High-performance urban climate models can form the basis for prospective planning decisions. The funding program 'Urban Climate Under Change' [UC]<sup>2</sup> aims to further develop the innovative and user-friendly urban climate model PALM-4U (Parallelized large eddy simulation model for urban applications) that allows simulating microscale atmospheric processes in urban areas.



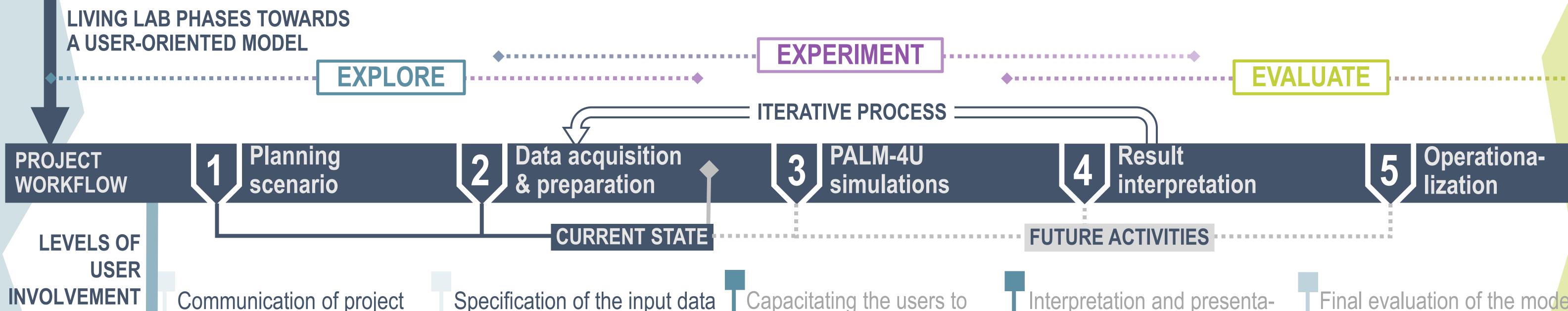
ProPolis as a part of [UC]<sup>2</sup> focuses on the operationalization of PALM-4U with the main goals practicability, continuation strategy and capacity building (see Fig. 1). Potential users from the planning practice are closely involved into the project work through an iterative living lab process divided into exploration, experimentation and evaluation phases.

# Where science meets the user.

Living lab method to support the co-development of the new urban climate model PALM-4U.

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goals and timeline

Information

Consultation

Building

capacities

Defining PALM-4U user types: 9 assisted users and 6 service users

Defining standard application fields (thermal well-being, wind comfort, air quality)

Choosing PALM-4U test cases from the real planning practice (e.g. comparison of effects from planned green and blue infrastructure on human thermal well-being)

Capacitating the users to needed for model simulations apply the model by themselves through several PALM-4U GUI trainings Assisting the users to collect

> Self-application phase: setting up and performing simulations

Testing the prototypes for technical support services (e-mail, telephone, remote

Exchange in an onlineforum among the practice partners and with external interested parties

Interpretation and presentation of simulation results in individual workshops moderated by ProPolis experts

Discussions on alternative scenarios in interdisciplinary cross-departmental settings

Elicitating the user requirements for the integration into municipal planning workflow

Evaluating and further developing the GUI and support services

Final evaluation of the mode practicability

Developing the continuation strategy from practice perspective: e.g. contingent for the technical infrastructure and services, suitable operation models, requirements for implementation at the users' organization

Final products: release of PALM-4U GUI, standard application catalogue, user manuals, service desk, online-forum

of the final products.

 Relevance and foreseen application benefits / added value of the model application increase motivation for participation of practice partners. Also, clear agreements about project workflows and continuous communication about the model development process are crucial for the success of the project.

**USERS** 

12 German municipalities and an architecture

and consultant company participate in ProPolis.

During the exploration phase, ProPolis scien-

tists discussed the GUI concepts, training and

support services with practice partners in

several transdisciplinary workshops. Their feed-

back is translated into practicability require-

ments (user requirement catalogue) which will

be used for evaluation and further development

The conclusions of the exploration phase for

the time during (1) and after the project (2) are:

 Adaptations in the project schedule might be required to meet specific user requirements.

- Testing the planning cases in a real municipal environment allows consideration of user requirements in early development stages which can accelerate the application of the model in practice.
- Non-scientific users will apply PALM-4U only when the model use can be integrated in their daily work routines.
- Without financial and technical support beyond the project lifetime the model operationalization in practice is challenging.

## **USER PARTICIPATION FORMATS**



Joint workshops (online thematic Ex-Labs)



and translate the input data

Elicitating user practicability

requirements for PALM-4U

Operationalizing standard

Elaborating the concepts

and workshops on-site

application setups in the GUI

for training, support services

model and the graphical user

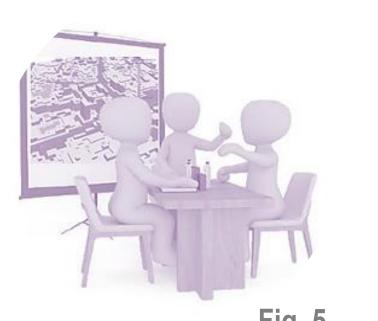
in PALM-4U format

interface (GUI)



**GUI-trainings &** self-application





Final workshop



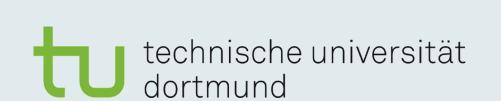




Fig. 2 Map of project partners

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More information on www.uc2-propolis.de

