IBPSA Project 1

BIM/GIS and Modelica Framework
for
building and community energy system
design and operation
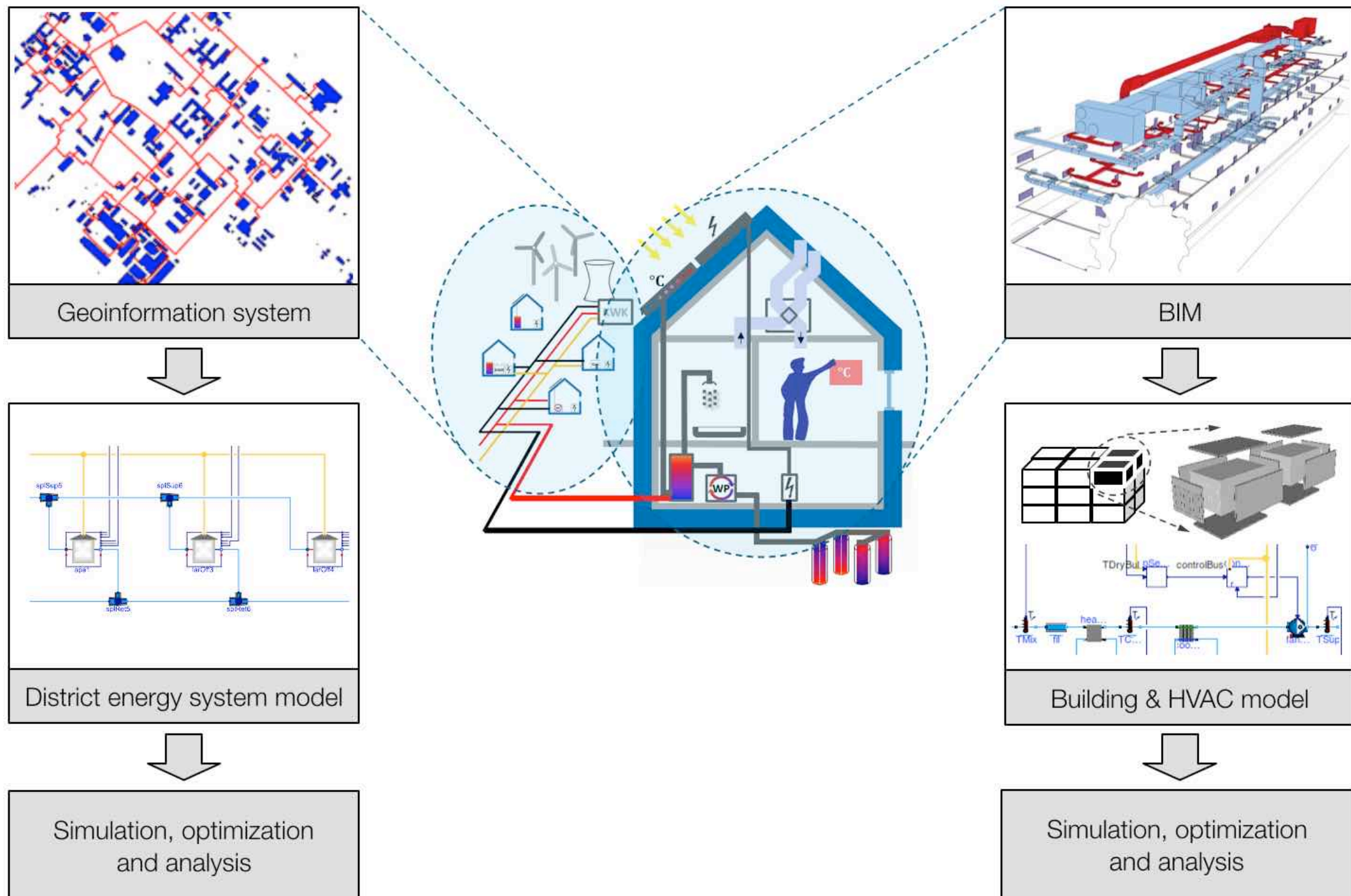
Michael Wetter, LBNL, Berkeley, CA

Christoph van Treeck, RWTH Aachen

Jerome Frisch, RWTH Aachen

October 13, 2020

The vision of IBPSA Project 1 is to create open-source software that builds the basis of next generation computing tools for the buildings industry

Geoinformation system

District energy system model

Simulation, optimization and analysis

BIM

Building & HVAC model

Simulation, optimization and analysis

Structure

Task 1: Modelica libraries for building and community energy systems

- WP 1.1: Library for design and operation
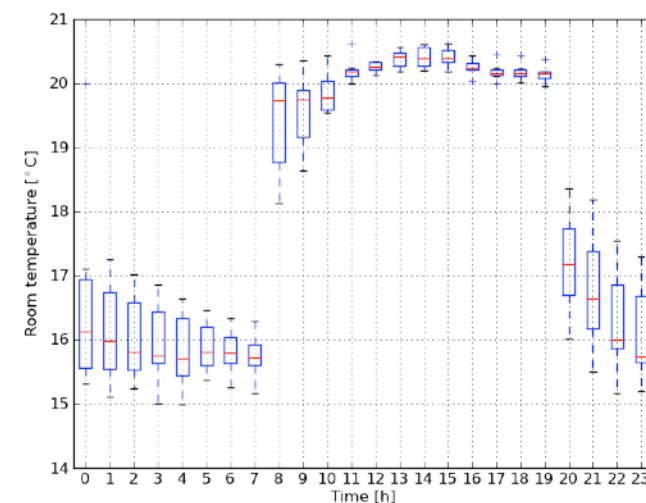- WP 1.2: Model Predictive Control
  - BOPTEST
  - MPC Library
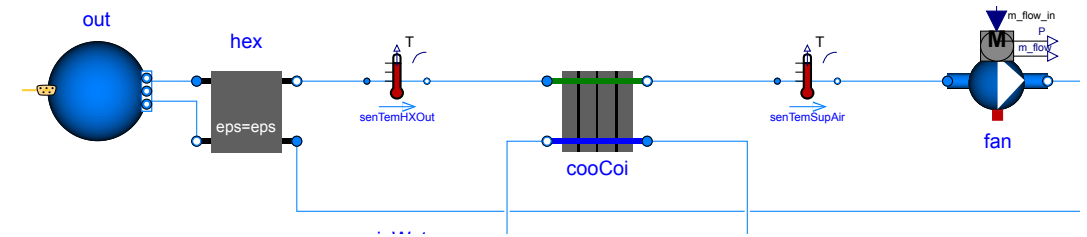
Task 2: Building and City Quarter Models

- WP 2.1: City Quarter Information Modeling
- WP 2.2: Building Information Modeling

Task 3: Application and Dissemination

- WP 3.1: Validation (DESTEST)
- WP 3.2: Application

Levels of participation

Sponsoring participant

- Cash $5k per year. Thanks to
  - ENGIE Lab

Organizational participants

- minimum 0.5 full time employee per year, over the 5 year project

- contribute to 5 to 10 web-based coordination meetings annually

- attend semi-annual expert meeting, generally lasting 2 days

Individual participants

- no predetermined level of commitment, but needs to provide substantial contributions
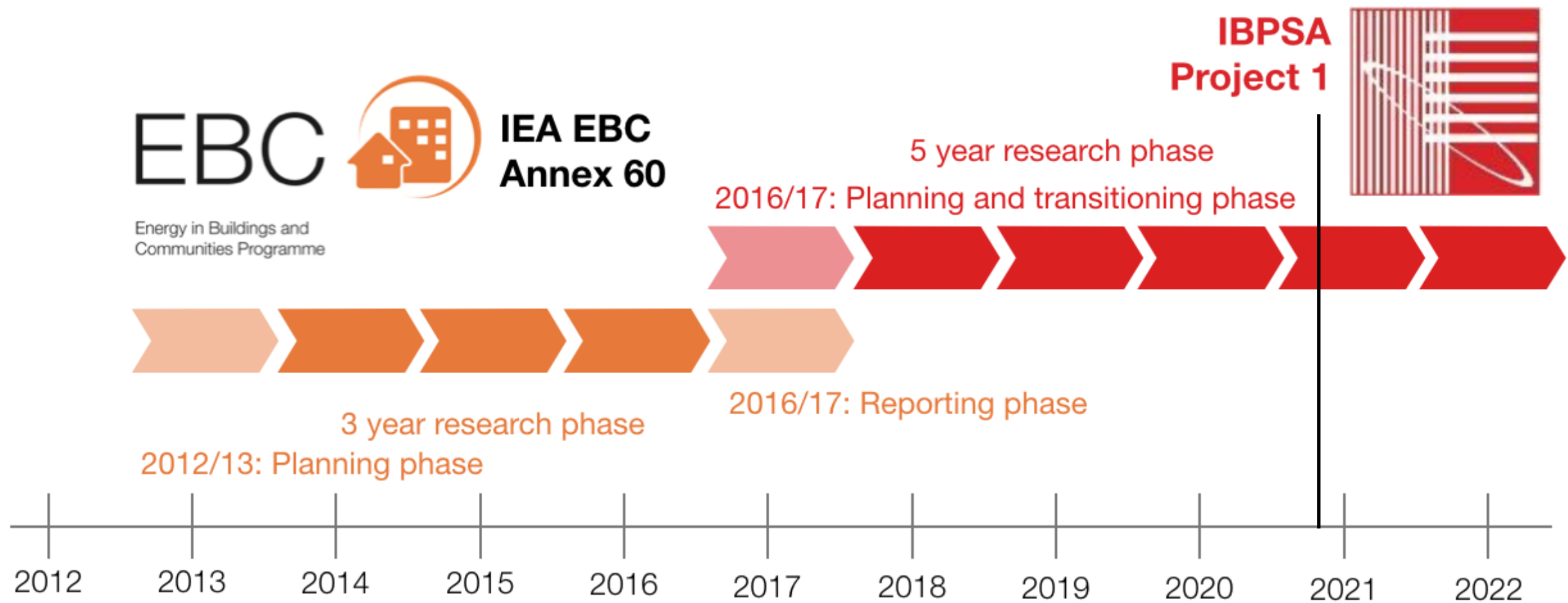
Intellectual property

IBPSA is the copyright and license holder.

All workshops, software and documentation will be open accessible to anyone.

Modelica models and other code will use the open-source BSD 3-Clause License.

Timeline

Agenda

Day 1

7:00 Brief overview and logistics (Michael Wetter, Christoph van Treeck, Avichal Malhotra)

Zoom setup, breakout rooms, participant names.

7:20 *Presentations from activities, recent work and overview of this meetings breakout groups* (each 10 min plus 5 questions, 5 min buffer)

8:55 Project 1 publications

9:00 Break

9:10 Breakout groups 1

10:00 Short break and switch to next breakout groups

10:05 Breakout groups 2

11:00 Breakout groups adjourn

Day 2

7:00 Organization of the day (Michael Wetter and Christoph van Treeck)

7:10 Integration of data-driven approaches in the various tasks

10 min links/opportunities to AI community (Jan Drgona)

30 min "Data-driven modelling, forecasting and control for buildings in the future low carbon society" (Henrik Madsen)

20 min discussion, and optionally poll about needs for the different tasks

8:10 Break and switch to breakout groups

8:15 Breakout groups 3, breakout groups may discuss data-driven approaches in their work packages

9:00 Short break and switch to next breakout groups

9:05 Breakout groups 4

9:50 Break and switch to main meeting

10:00 Brief report from breakout groups, and next steps (5 min each, 40 min total includes 10 min buffer)

10:40 Planning of next expert meeting

10:45 Feedback and next steps

11:00 Adjourn