IBPSA Modelica Working Group

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Agenda

Introductions

Purpose and scope

Background

- IEA EBC Annex 60 and IBPSA Project 1
- Modelica IBPSA Library
- Modelica Challenge Problems

Meetings

Duties of IBPSA and the Working Group

Intellectual Property

Organization

Other business

Purpose and Scope

1. Maintain and further develop the Modelica IBPSA Library.

   The Working Group shall follow state of the art principles that ensure that models are reviewed, validated and well documented. The development shall respond to the requirements of 3rd party libraries that integrate the Mod- elica IBPSA Library as its core library. The Modelica IBPSA Library shall remain available under the existing BSD license.

2. Coordinate the needs of the IBPSA community with the Modelica Association and with Modelica modeling and simulation environment developers.

Background

EBC

Energy in Buildings and Communities Programme

IEA EBC Annex 60

IBPSA Project 1

5 year research phase

2016/17: Planning and transitioning phase

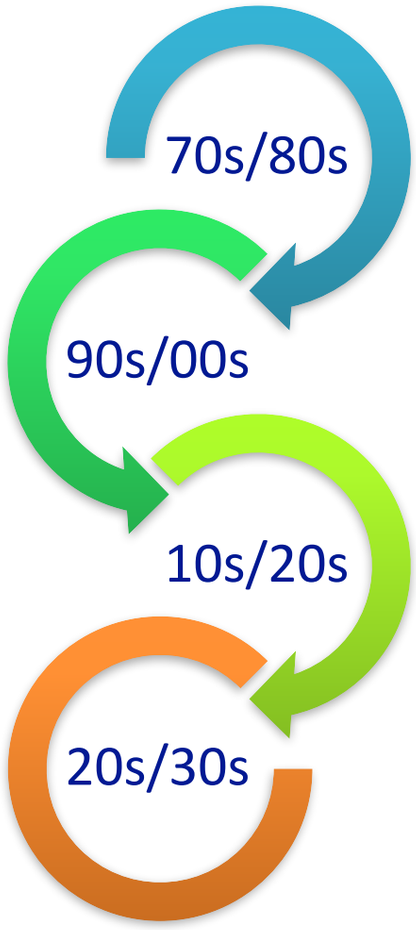
2016/17: Reporting phase

3 year research phase

2012/13: Planning phase

2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

Goals of IBPSA Modelica Library

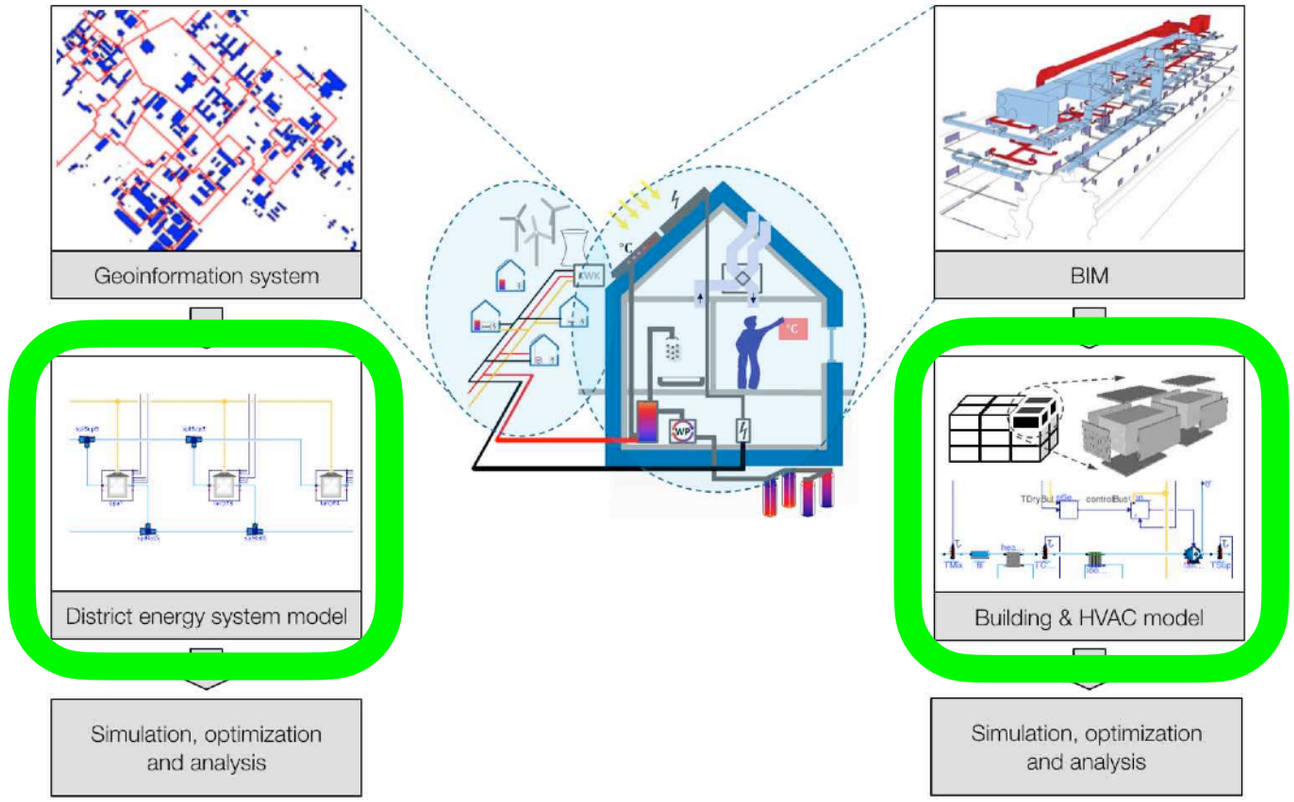


Simulation

Modeling

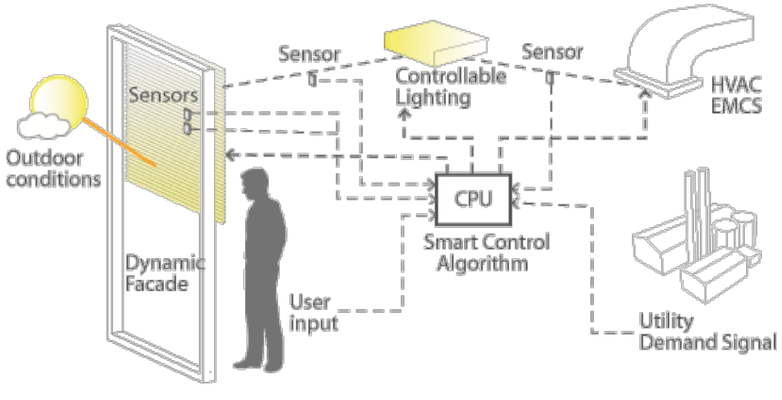
Tool integration

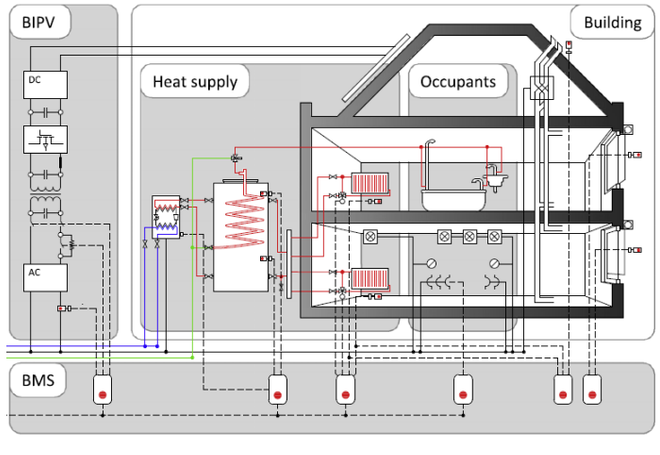
Autonomous modeling

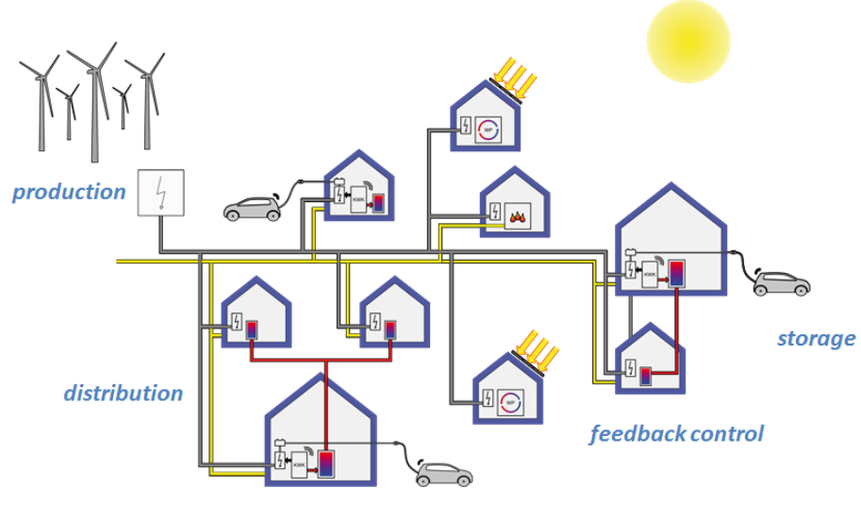


Develop Modelica library applicable for system-level autonomous modeling.

- validated
- well documented
- state-of-the-art physics and dynamics







From controls to buildings and communities

IBPSA Modelica Library

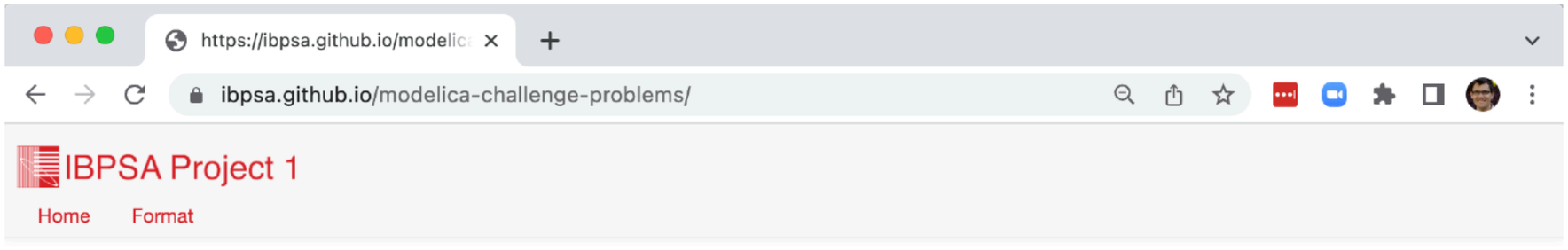
Used as the core of the user-facing libraries

- AixLib
- BuildingSystems
- Buildings
- IDEAS

Developed at https://github.com/ibpsa/modelica-ibpsa

46 people contributed code

Modelica Challenge Problems



Modelica Challenge Problems

Collection of challenge problems for Modelica tool developers

This repository collects challenge problems in the area of buildings and district energy system simulation. The collection is meant to assist tool developers in improving Modelica simulation backends, their solvers and diagnostic messages.

Model	Tool	Summary	Status	Discussion
Buildings.Examples.DualFanDualDuct.ClosedLoop	Dymola	Simulation that hangs. The dslog.txt file is empty and the simulation window does not show any diagnostics. Details.	work-around	discussions/3
DualFanDualDuctSteadyStateJunction	OPTIMICA	HVAC and building model that stalls during the simulation. Details.	open	
Buildings.Examples.DualFanDualDuct.ClosedLoop	OpenModelica	The simulation fails with the cvode solver. Details.	open	
IBPSA.Fluid.Examples.FlowSystem.Simplified1	Dymola	Flow system in which the nonlinear system of equation cannot be solved during the time integration. Details.	work-around	discussions/4
IBPSA.Fluid.Examples.FlowSystem.Basic	OPTIMICA	Flow system in which the time integration stalls. Details.	open	
Buildings.Air.Systems.SingleZone.VAV.Examples.OptimalStart.Guideline36Summer	OpenModelica	The simulation fails. Details.	open	

For problems or questions regarding this page contact MWetter@lbl.gov

Initial members

The initial slate of members that confirmed their participation in Spring 2022 is as follows:

- Michael Wetter (LBNL, USA)
- Saranya Anbarasu (Penn State, USA)
- David Blum (LBNL, USA)
- Yash Shukla (CEPT University, Ahmedabad, India)
- Massimo Cimmino (Polytechnique Montreal, Canada)
- Mingzhe Liu (Penn State, USA)
- Kathryn Hinkelman (Penn State, USA)
- Jelger Jansen (KU Leuven, Belgium)
- Filip Jorissen (KU Leuven, Belgium)
- Klaas de Jonge (Ghent University, Belgium)
- Chengnan Shi (Penn State, USA)
- Christian Vering (RWTH Aachen, Germany)
- Christoph Nytsch-Geusen (UdK Berlin, Germany)
- Alessandro Maccarini (Aalborg University, Denmark)
- Hongxiang (Casper) Fu (LBNL, USA)
- Wangda Zuo (Penn State, USA)

We welcome new members who are interested in contributing to the scope:

1. Subscribe to https://groups.google.com/g/ibpsa_modelica_working_group and
2. let MWetter@lbl.gov know that you like to join and contribute to the Working Group.

We are also interested in corporate members who donate $5k/year which will be used to offset costs, fund students to participate, etc.
Contact MWetter@lbl.gov

Meetings

Monthly coordination meetings.

Annual in person meetings, if possible co-located with IBPSA or Modelica conferences to minimize travel.

Meetings are announced at mailing list:

https://groups.google.com/g/ibpsa_modelica_working_group

Meeting agendas are posted at

https://github.com/ibpsa/modelica-working-group/wiki/Meetings

Duties

Duties of IBPSA

IBPSA will administer the funds of the project. If the Working Group receives 3rd party sponsorship, 10% of the received funds will remain with IBPSA to compensate for overheads, and the other 90% can be used by the Working Group to cover expenses at the discretion of the Chair of the Working Group. When the Working Group terminates, all remaining funds will be owned by IBPSA.

As the IBPSA Project 1 has excess funds of about US-$13,000 that will flow to IBPSA when Project 1 finishes, IBPSA will provide initial funds to the Working Group of US-$4,000.

If the Working Group's funds are depleted, upon approval by the IBPSA Board or its designated delegate,

- IBPSA shall contribute funding to cover expenses for in-person coordination meetings, such as for rooms and food.
- IBPSA shall contribute funding to use services for continuous integration testing such as github, travis or similar.

Duties of the Working Group Chair

The Working Group Chair will provide an annual progress report to the IBPSA Board.

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 (as was the case for Project 1).

Organization

Code development is at
https://github.com/ibpsa/modelica-ibpsa

Site for other documents is
https://github.com/ibpsa/modelica-working-group

For joint publications that arise from this Working Group, add acknowledgment from
https://github.com/ibpsa/modelica-working-group/wiki/Acknowledgement

Other business

Call for a secretary

- Organize meetings
- Issue meeting minutes
- Help with communication
- Keep track of members
- ...