



# IBPSA Project 1

Modelica Buildings library 2.0

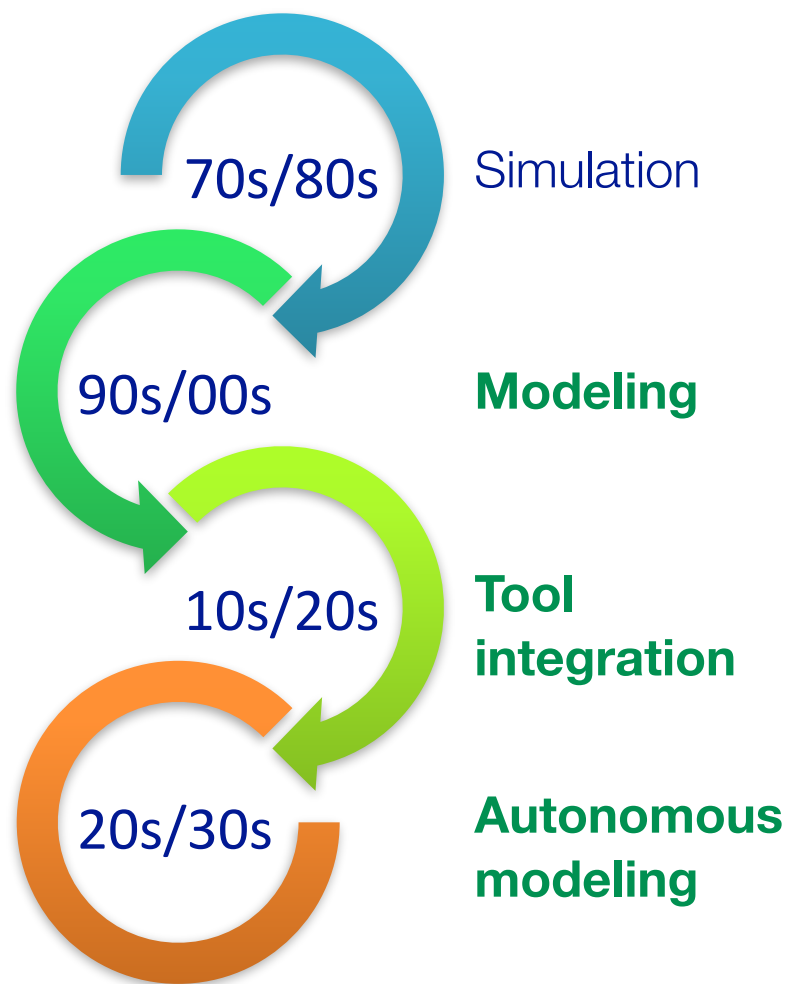
Michael Wetter

February 27, 2018



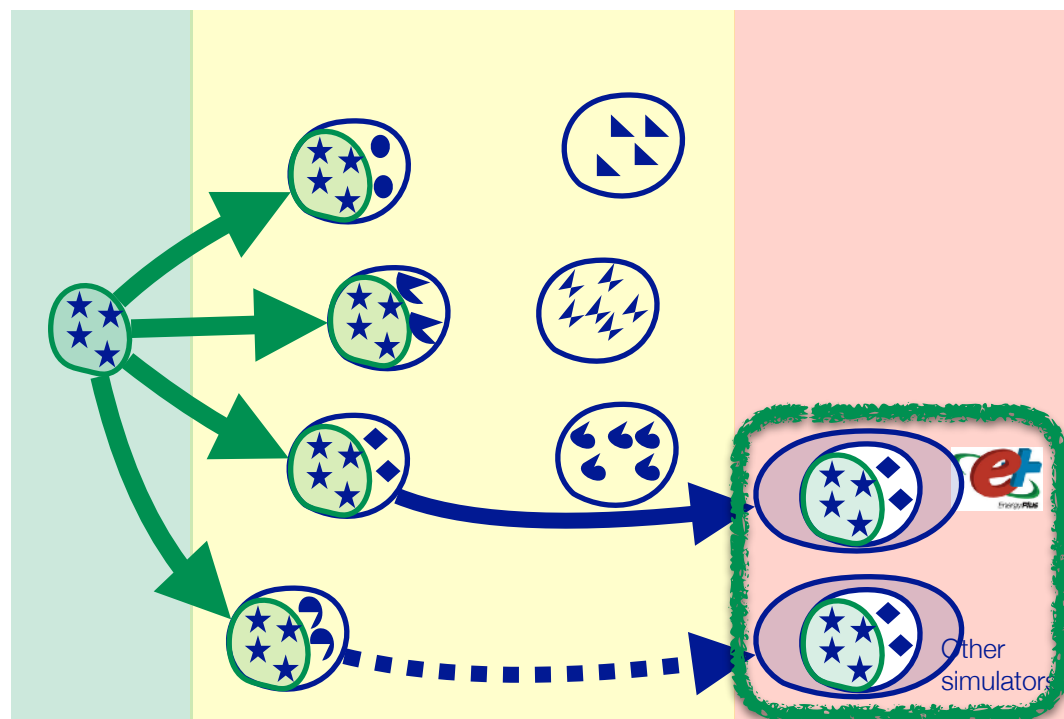
Lawrence Berkeley National Laboratory

# Goal



Comprehensive, validated, documented library for fast and robust simulation.

In future, typically embedded as the engine for various applications.



The vision is to create a flexible computing infrastructure for

- a) the basis of the “Spawn of EnergyPlus”, and
- b) design, research, product development and operation of building and community energy systems.

# Target users

1. Mechanical engineers (that usually use models as part of another software).
2. Building and electrical grid scientists & students.

# Target application

1. Building HVAC & controls, maybe extension towards envelope as performance allows.
2. District heating and cooling, including link to electrical distribution grid.
3. Design -> deployment -> verification -> operation.
4. Typically embedded in other applications
  1. “Measures” that are applied to manipulate the model (e.g., OpenStudio Apps that use measures)
  2. Generative (optimization-based) design
  3. Stock modeling
  4. Controls testing and benchmarking
5. In future probably less common but important for R&D and further development: users directly using library.

# Models for addition to IBPSA

Python package (Utilities.IO.Python27 from master).

Buildings.Controls.OBC.{CDL,ASHRAE}

Heat pump based on calibration (<http://simulationresearch.lbl.gov/wetter/download/2017-CimminoWetter.pdf>) (ideally need to streamline calibration/data specification)

Buildings.Electrical (but have currently no project to develop it further).

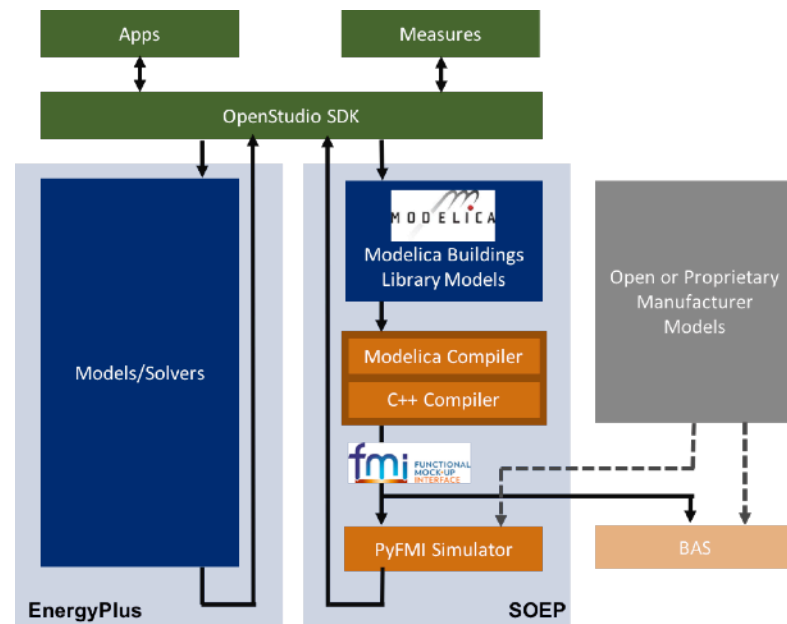
# Ideal outcome of project

Large, robust, validated and documented “industrial-strength” Modelica library.

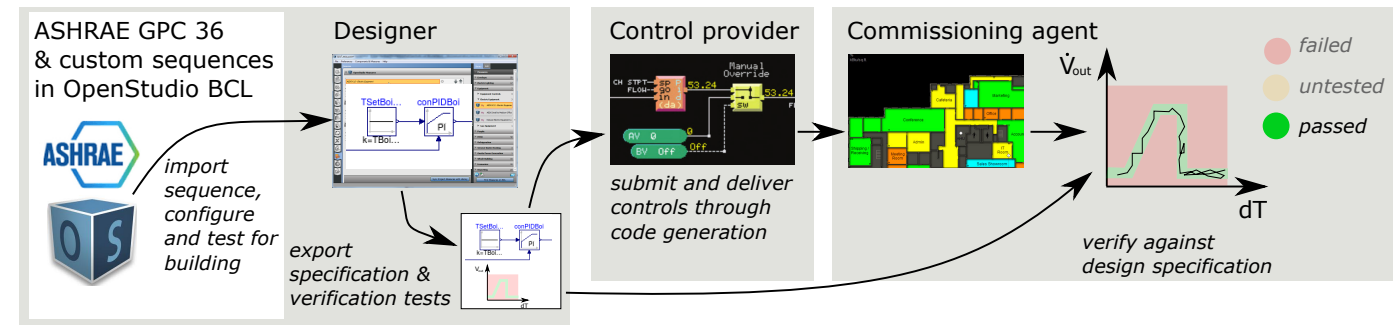
Get more developers involved.

# Ongoing

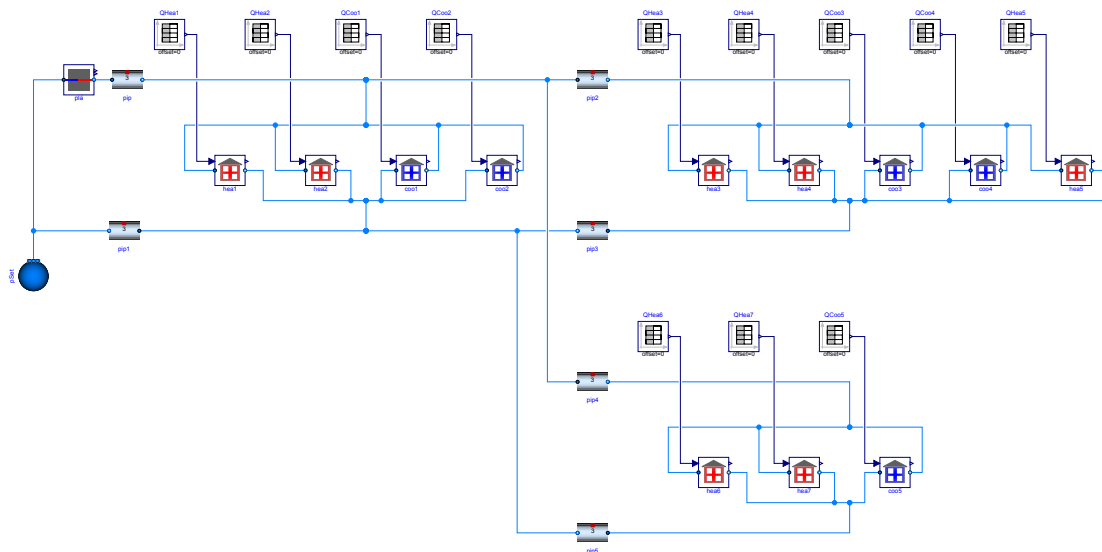
## Spawn of EnergyPlus



## OpenBuildingControl



## Models for district energy systems



## Data center design tool

