

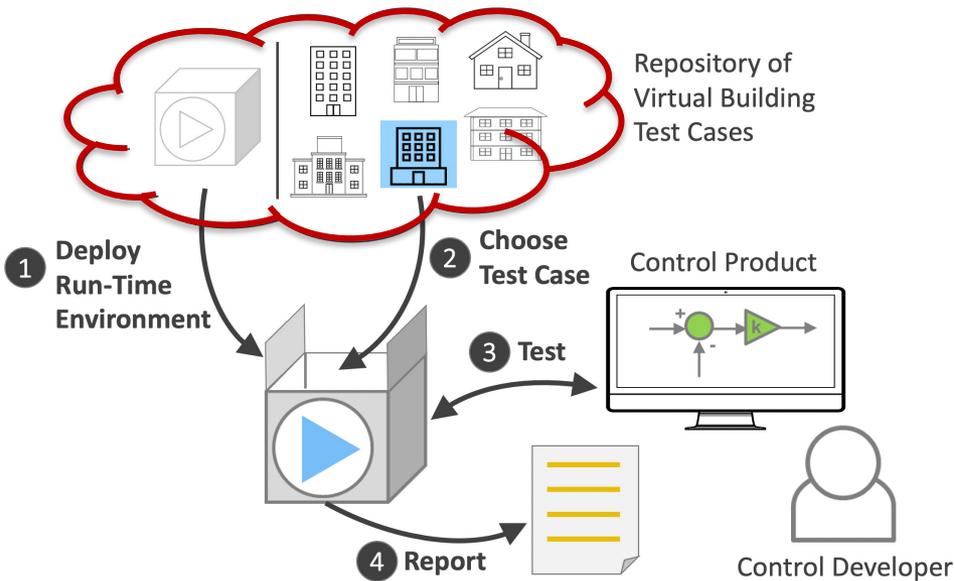
IBPSA Project 2 Expert Meeting

Task 3: Test Cases

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Task 3: Test Cases Technical objectives



This task focuses on development and maintenance of benchmark test cases. Test case development utilizes the Modelica language and Functional Mockup Interface (FMI) standard.



Most models are derived from open-source libraries that extend from the Modelica IBPSA Working Group.



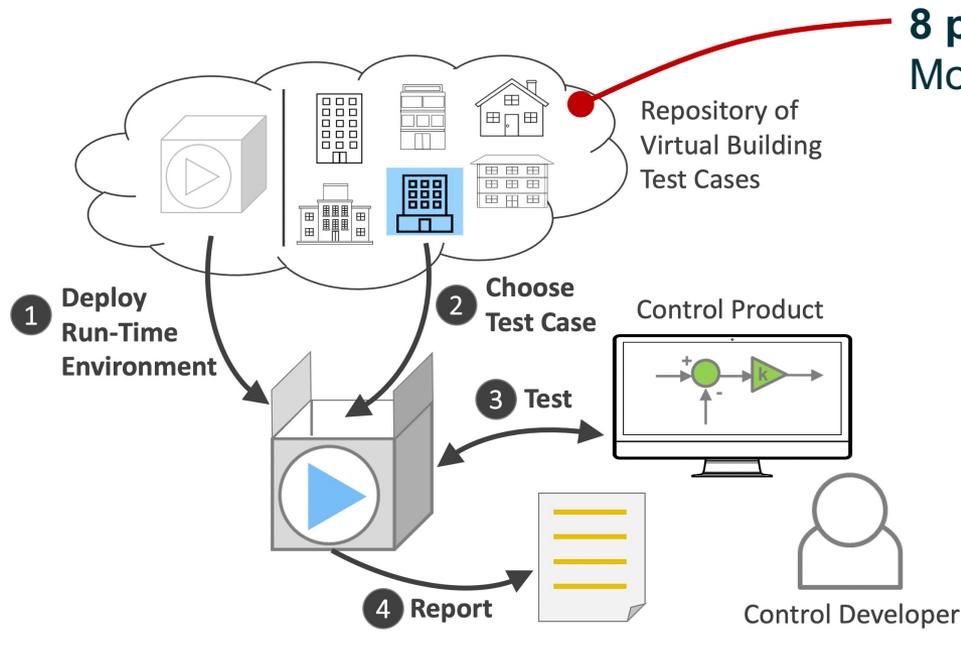
IBPSA Modelica working group

Updating compilation and simulation tools

New test cases interests:

- District heating and cooling systems
- Energy storage and distributed energy resources
- Electric grid integration

Task 3: Test Cases Progress, available test cases



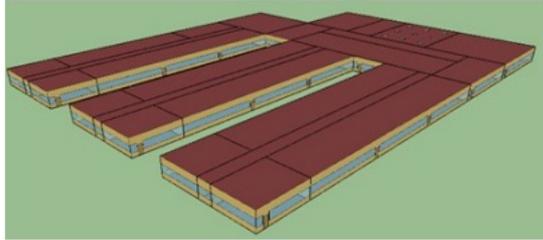
8 publicly available test cases
More under active development

Hydronic	Air
1 Zone, Radiator	1 Zone, FCU
1 Zone, Radiant Floor, Heat Pump	2 Zones, FCUs, AHUs Heat Pump, Chiller
2 Zones, Radiant Floor, Heat Pump	5 Zones, 1 VAV AHU, Heat Pump, Chiller
1 Zone, Radiator, AHU, CO ₂ Control	10 Zones, 1 VAV RTU, DX, Ele. Heat
8 Zones, Radiators, Boiler, Split Cooling	15 Zones, 3 VAV AHUs, Boiler, Chiller

Available
 Implemented, but not yet available

Furthermore a total of 25 issues were, and 8 closed, for enhancement and bug fixing of test cases

Task 3: Test Cases Progress, new test cases



- Primary school in Montreal, Quebec, Climate Zone Climate Zone 6A (cold and humid)
- Reference building from the U.S. Department of Energy (DOE) building stock.
- HVAC System with radiators and VAVs supplied by boiler and coupled with high temperature electrical thermal storage using refractory bricks
- Modelling will be carried out in Spawn, E+ for envelope and Modelica for HVAC and controls



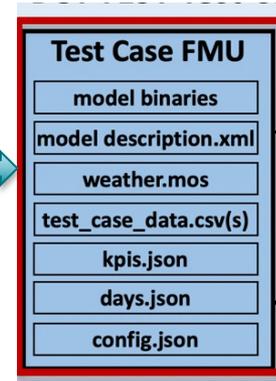
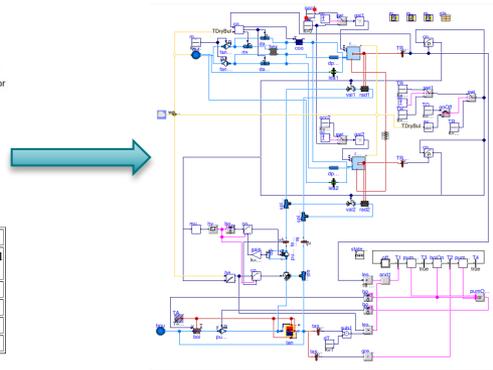
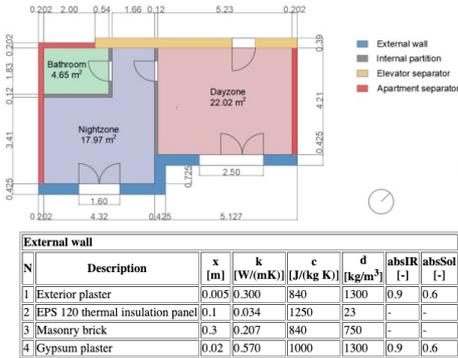
- Detached single-family house in Høje Taastrup (Denmark)
- Real testbed building used by university calibrated on experimental data
- HVAC systems with radiators supplied by heat pump.
- Models use Modelica and IDEAS library



- Primary school in Høje Taastrup (Denmark)
- Real testbed building used by university calibrated on experimental data
- HVAC systems with radiators supplied by district.
- Models use Modelica and IDEAS library

Testcase application form to submit new cases: [Test Case Application Form](#)

Task 3: Test Cases Progress, test case development



Data collection

- Aim to create cheat sheet with "typical" values

Model development

- Have monthly periodic meetings for feedback
- Open test case dedicated discussion tab on repository

Make test case BOPTTEST ready

- Have well documented utility scripts to help with the process
- Working on improving compilation toolchain moving away from Jmodelica deprecated and Modelica 3.2.3

Test case peer review

- Update test case [review document](#)
- Developing stress test script

Task 3: Test Cases Future Work

- Focus on updating underlying compilation and simulation toolchain to update all test cases to Modelica 4.0 and related libraries
- Continue enhancing and support current test cases
- Invite and support the creation of new test cases
- Carry out monthly update meetings for updates on current and new test case developments
- Continue improving test case development and review process

Task 3: Test Cases Progress, Breakout sessions

Session 1: Today 1:00-2:00 p.m.

- Updates to current test cases
- Updates to New test case development
- New test case ideas and contributions
- Changing the test case naming scheme (if time allows)

Session 2: Tomorrow 10:45 a.m. - 12:45 p.m.

- Test case compilation and execution tools
- Test case development and review process
- New ideas

<https://ibpsa.github.io/project1-boptest/ibpsa/project/meetings/task3/>