



IBPSA Project 1

7th Expert Meeting

WP 3.2 Application

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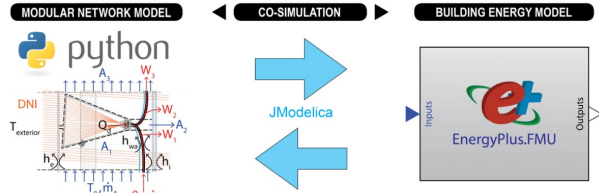
Activities

- Presentation of three case studies
- Live demonstration of BAGEL tool

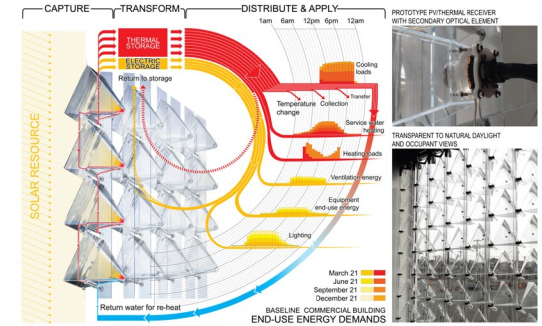
Case study 1: Co-simulation for building energy modeling with active integrated envelopes

Objective: To estimate energy savings potential of an active integrated envelope

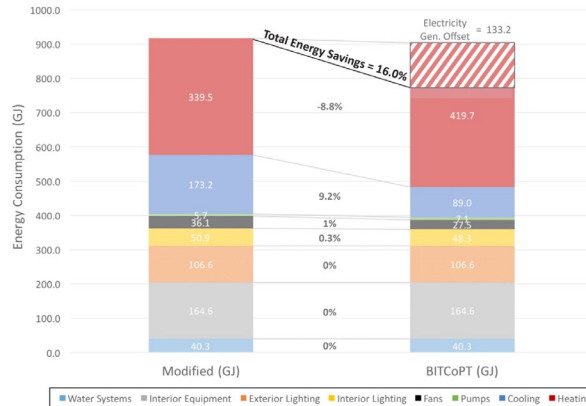
Method:



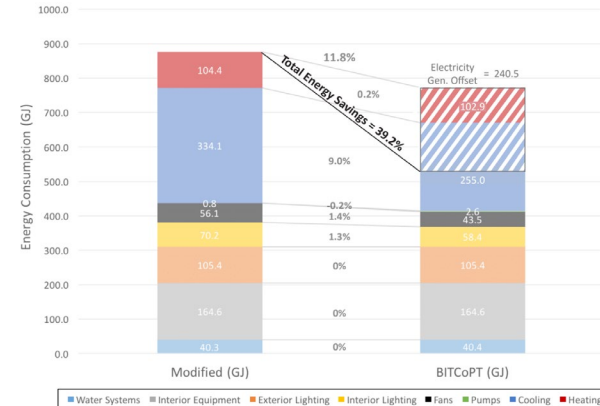
Moving towards Modelica
(Python model is fairly complex and difficult to understand for anyone coming into the project)



Results:



New York,
NY



Phoenix,
AZ

Case study 2: Energy performance of University building in Denmark

Objective: To test if a single zone model can closely predict energy consumption of the whole building, and simultaneously demonstrating reasonable indoor air temperatures and CO₂ concentration



Method:

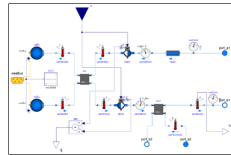


Fig.4 Air handling unit in Dymola

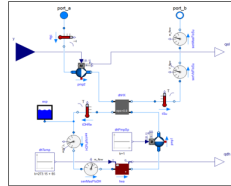


Fig.5 District heating system in Dymola

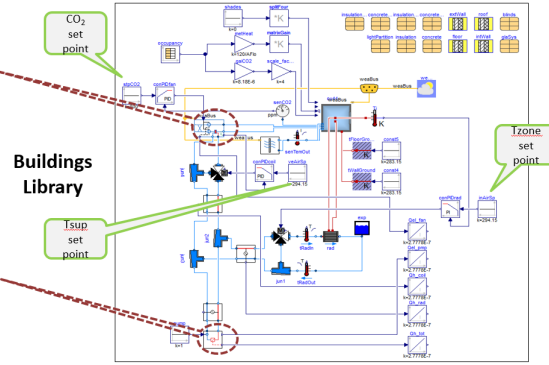
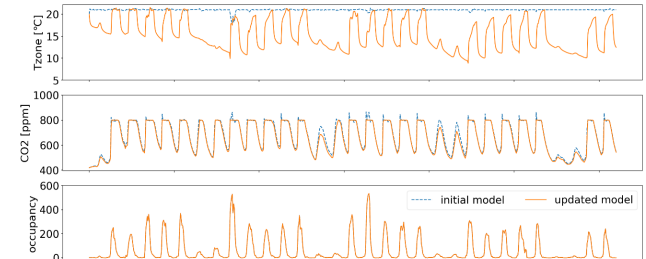


Fig.6 Modelica implementation of OU44 teaching building

Results:

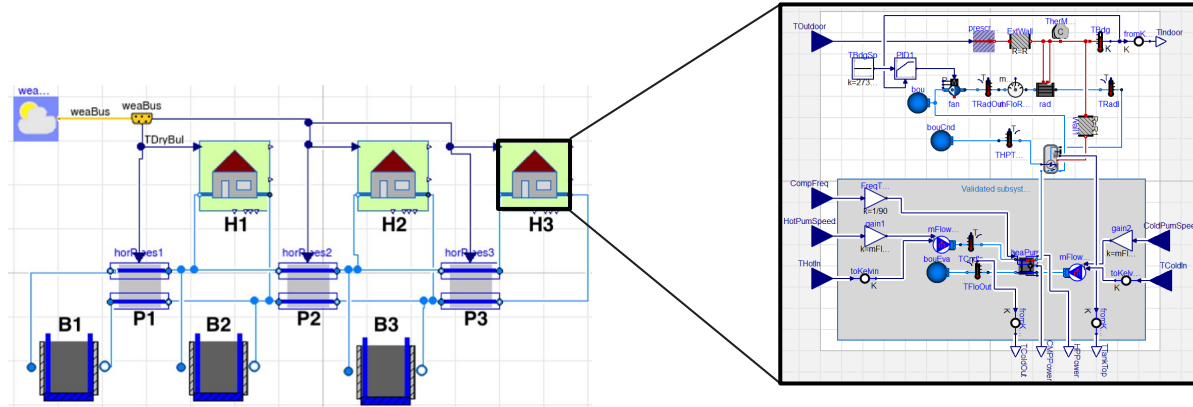
	Measurements	Simulations
Heating (Jan)	70 MWh	69.15 MWh
Ventilation (Jan)	2 MWh	1.27 MWh



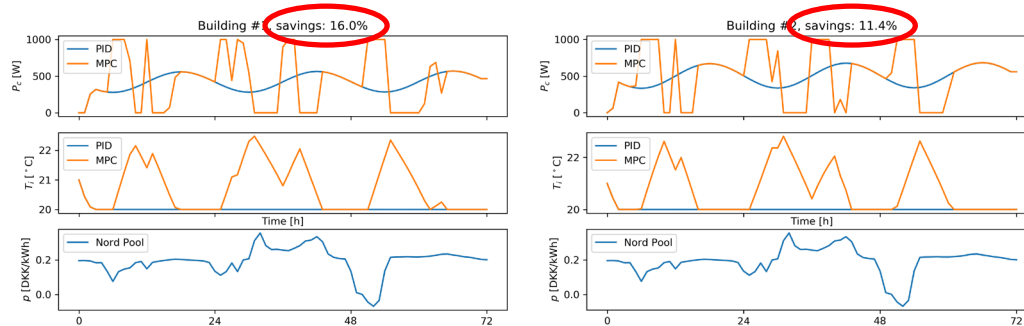
Case study 3: MPC-oriented models of a small district with geothermal heat pumps

Objective: To estimate cost savings of a small district heating network with MPC approach

Method:

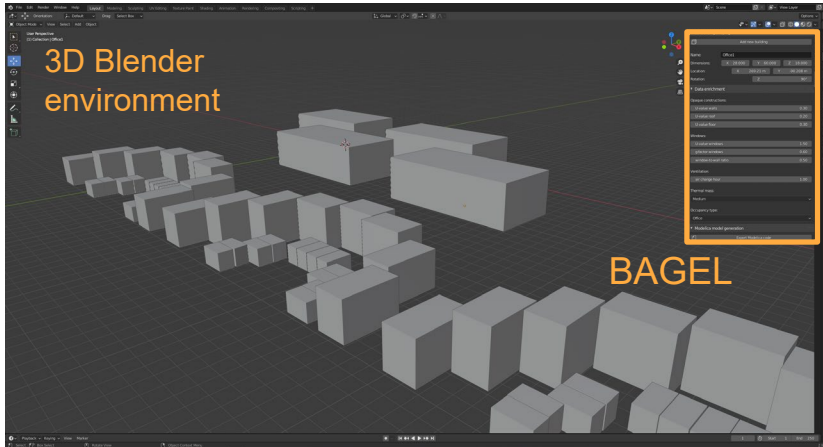


Results:



Next steps

- Continuing the collection and coordination of new case studies (if you want to include a new case study please drop me an email at amac@build.aau.dk)
- Add new features into BAGEL tool



1

Integrate simulation and results visualization directly into BAGEL/Blender



OpenModelica

2

Shading between buildings