

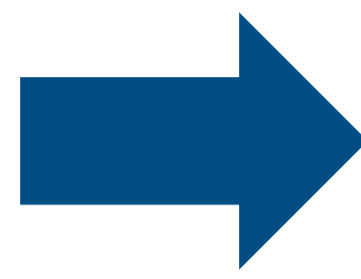
# Measurement-based control strategies for thermal comfort and regulation in low-temperature district heating networks

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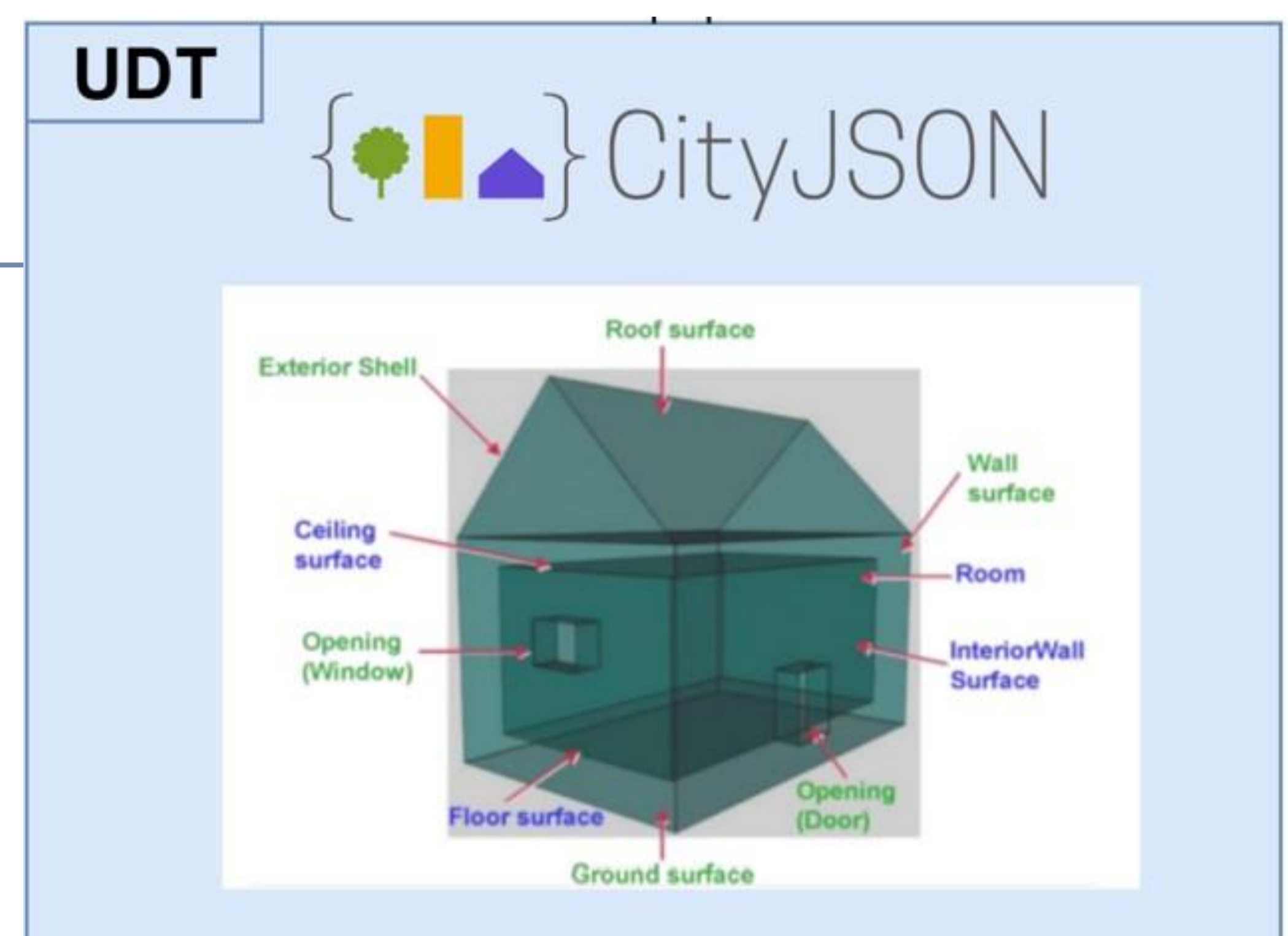
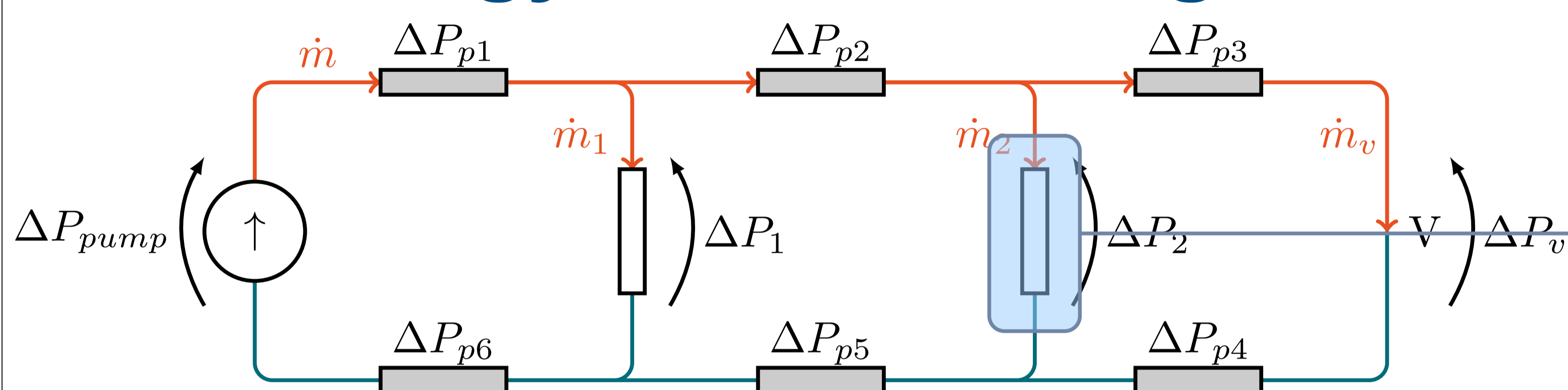
## Motivations

- Operation strategies
- Types of heat sources and thermal storage
- **Network design** **Low-temperature district heating network challenges**
- **Buildings refurbishment**



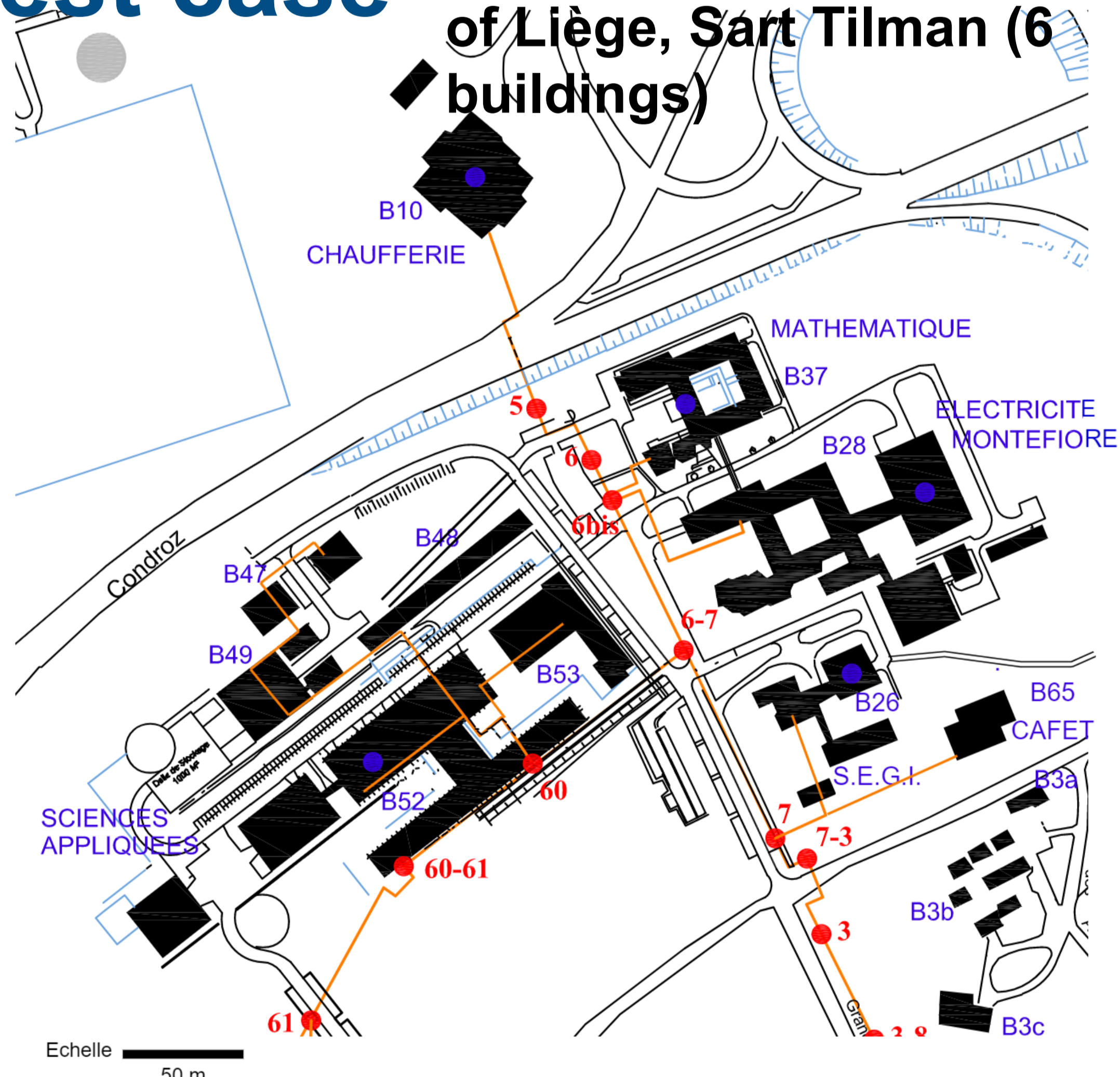
Develop a tool that **couple**s dynamic building models with low-temperature district heating network, capturing **heat transfer**, predicting **thermal comfort** and allowing **network design and sizing**

## Methodology and modelling

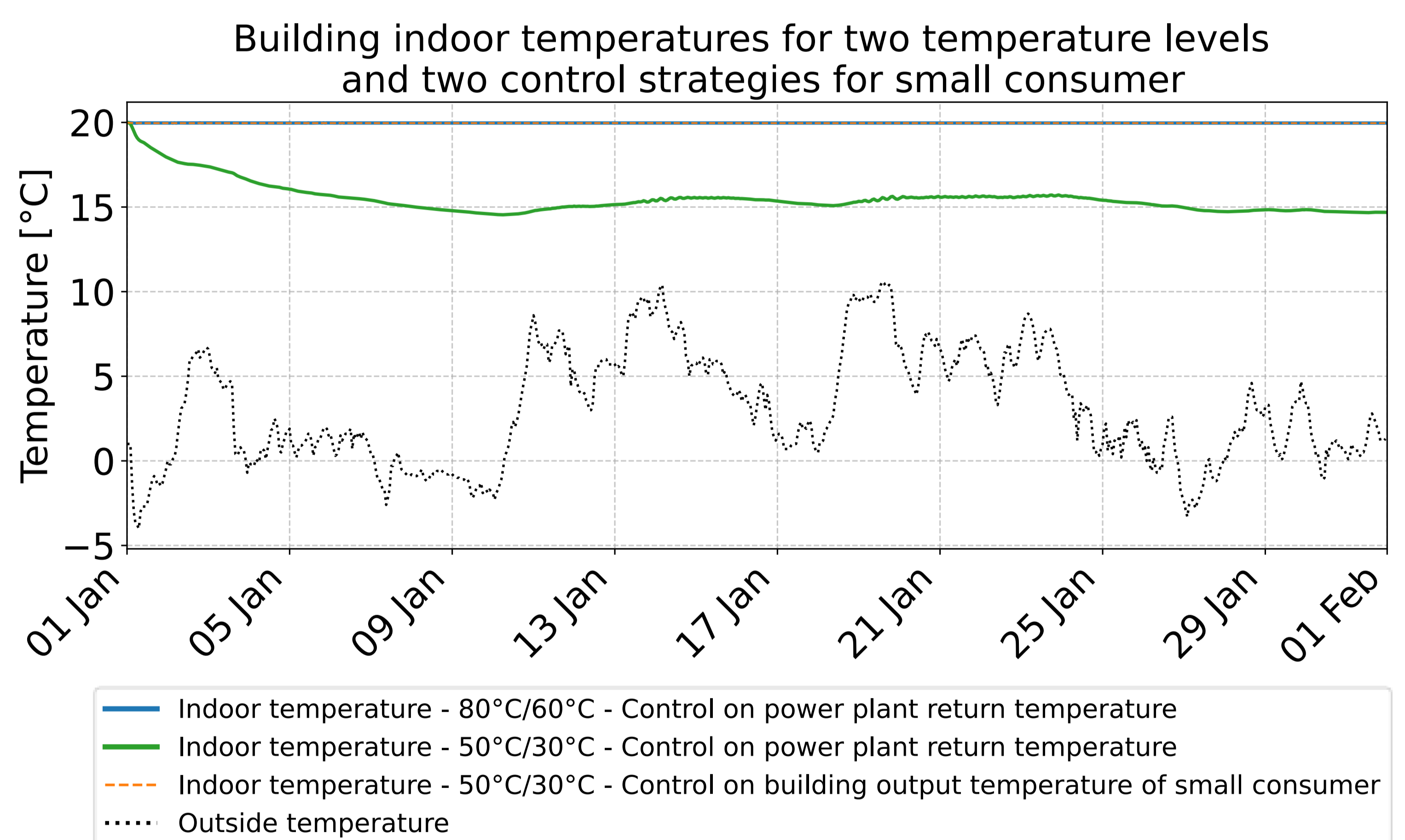


- **Integrated design** (thermal network and buildings)
- **Dynamic simulation** (mass and thermal inertia)
- **GIS** data-based buildings models
- “Simple” return temperature **control strategies** (based on measured data)
- Dymola and Modelica IDEAS Library

## Test case Polytech district, University of Liège, Sart Tilman (6 buildings)



## Results



## Conclusion

- **Integrated model value:** GIS-based integrated inertial models show that low-temperature networks impact buildings thermal comfort differently, highlighting those needing attention.
- **Regulation:** Targeted regulation based on measured temperatures can restore thermal comfort.

## Future work

- **Scenario testing:** The tool allows testing a wide range of scenarios, such as the effect of retrofitting buildings while lowering the network temperature.
- **Scaling up:** The tool should be expanded to a larger scale (continuing GIS integration).

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