Building modelling group

IBPSA Project 1 – WP3 - DESTEST

Agenda

- Results of first common exercise
- Conclusion of first common exercise
  - Building description
  - Report
- Future work

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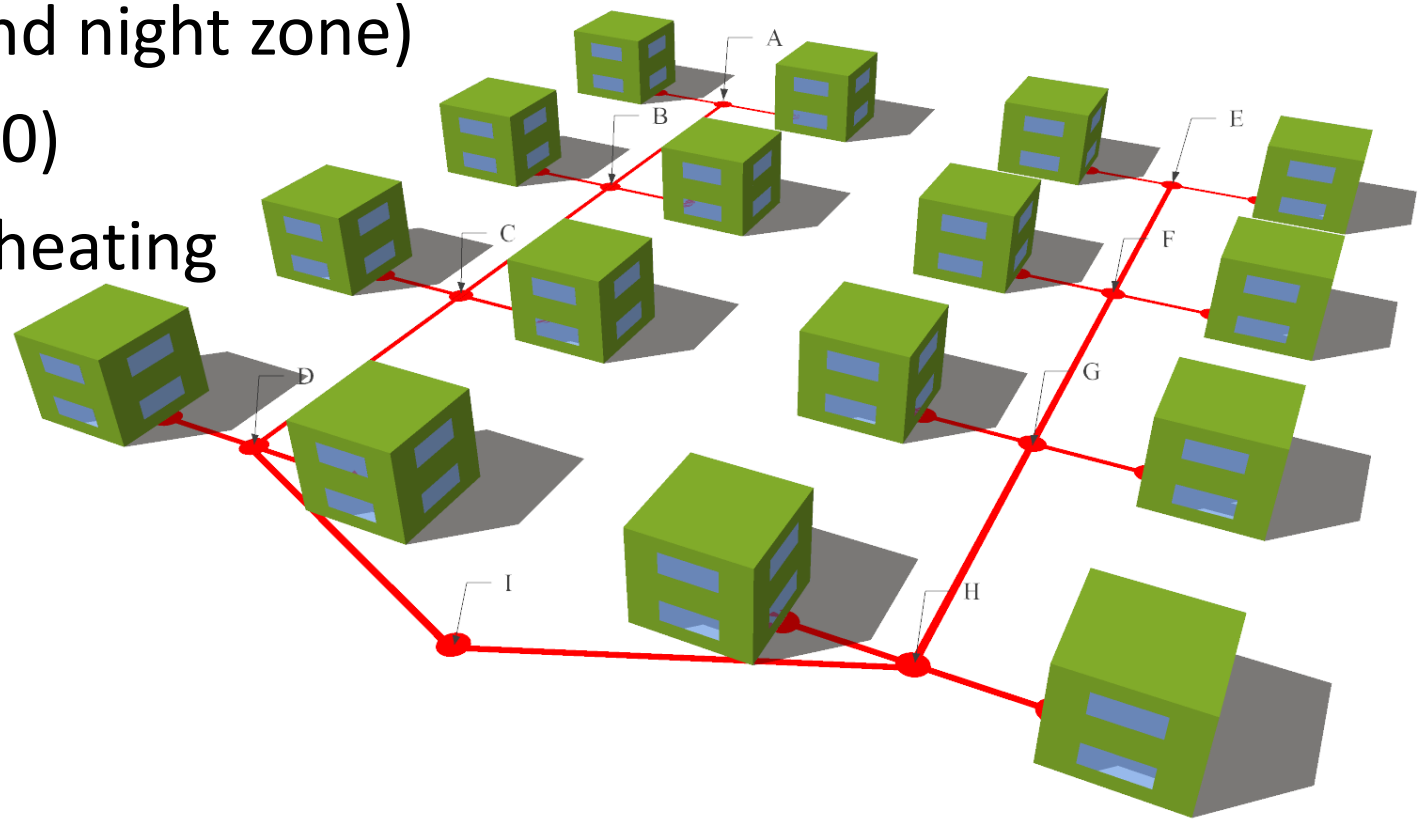
Start simple: 16 identical buildings

- Single-family dwelling of 1980
- Thermal performance based on TABULA project for Belgium
- Two-zone model (day zone and night zone)
- Standard occupant (ISO 13790)
- Only heat demand for space heating

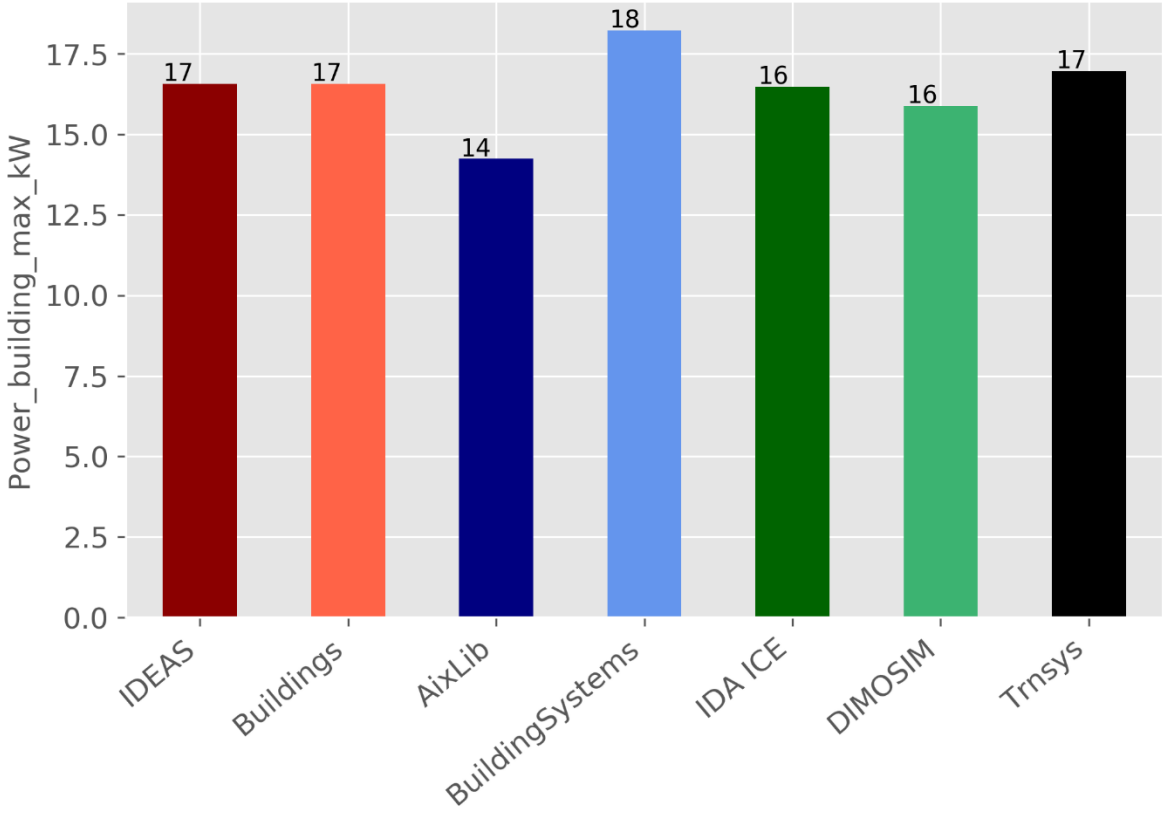


Participants

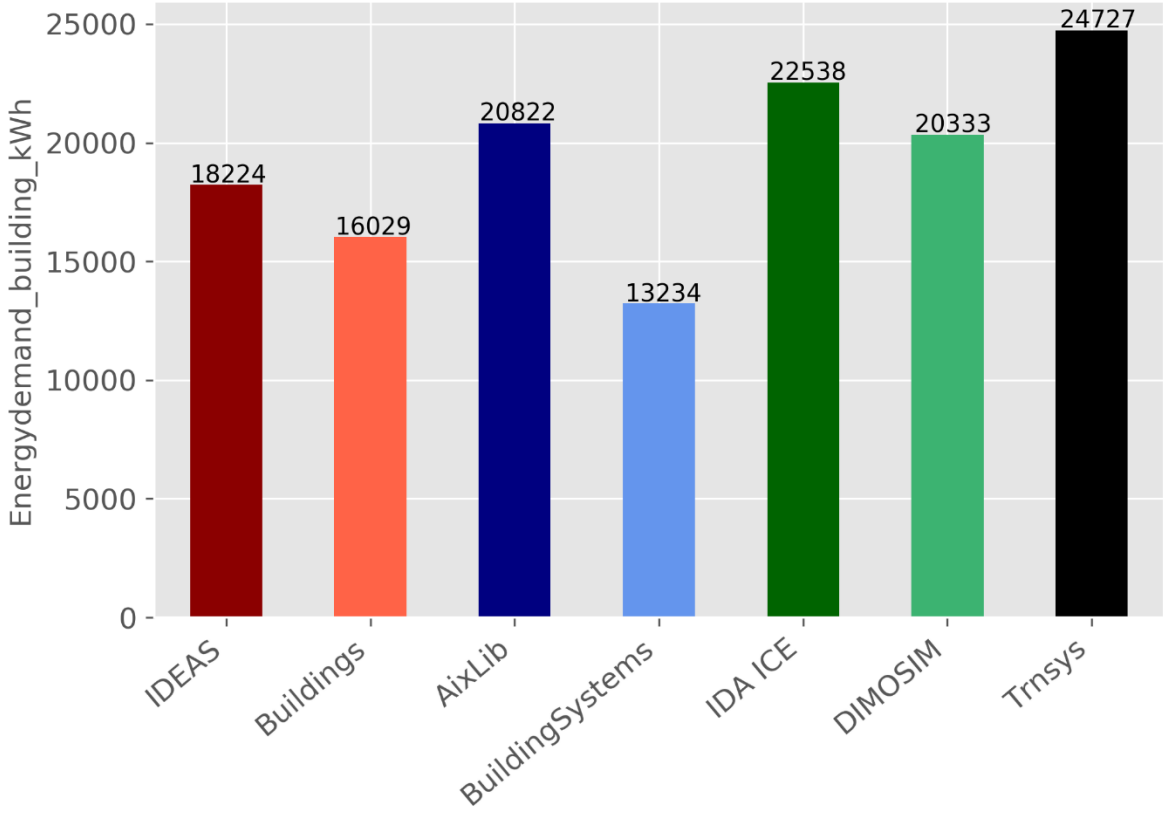
Modelling environment	Modeler	Affiliation of participant
Modelica IDEAS	Ina De Jaeger	KU Leuven / VITO / EnergyVille
Modelica Buildings	Alessandro Maccarini	Aalborg University
Modelica AixLib	Michael Mans	RWTH Aachen
Modelica BuildingSystems	Haris Shamsi	UCD Dublin
IDA ICE	Øystein Rønneseth, Igor Sartori	Sintef Norway
DIMOSIM	Enora Garreau	CSTB
Trnsys	Enora Garreau	CSTB

Peak power & energy demand

Peak power



Annual energy demand



Temperatures

Hours * degC over 25 degC

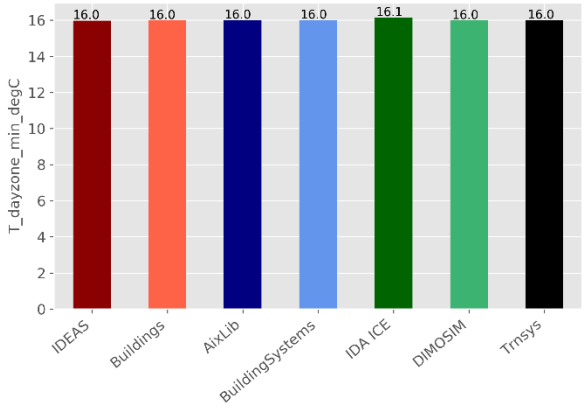
Min

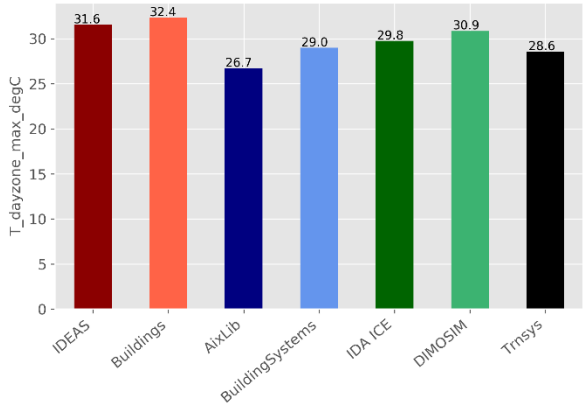
Max

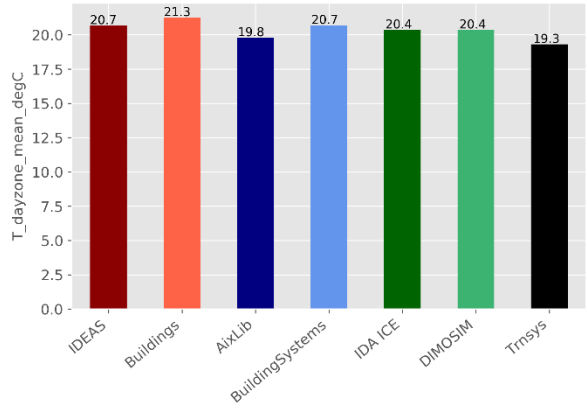
Mean

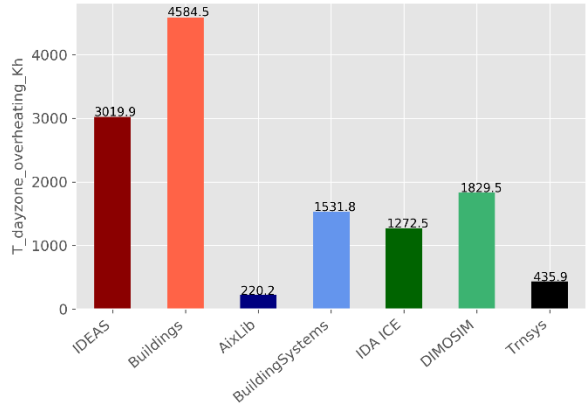
Overheating

Day zone

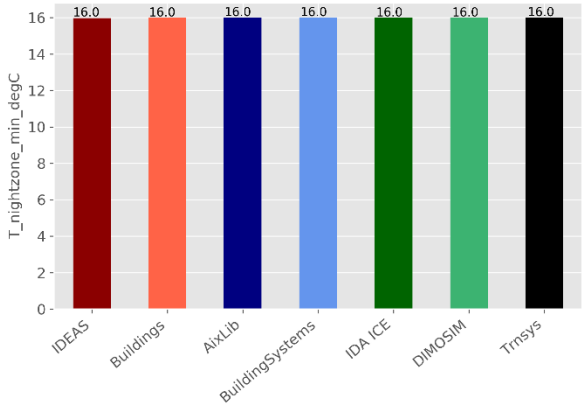


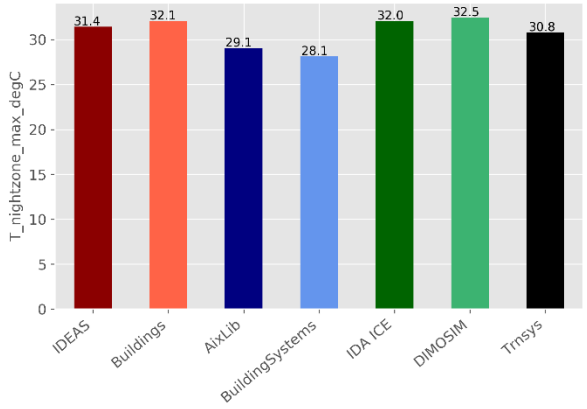


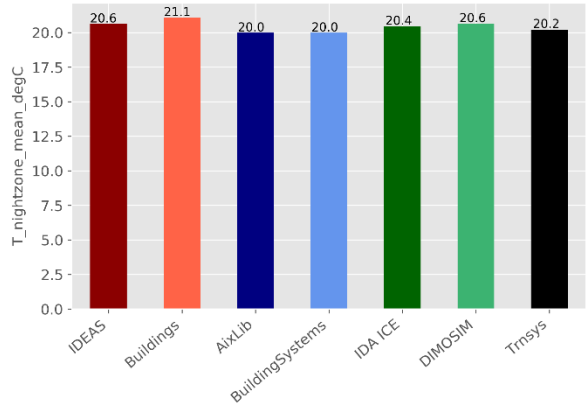


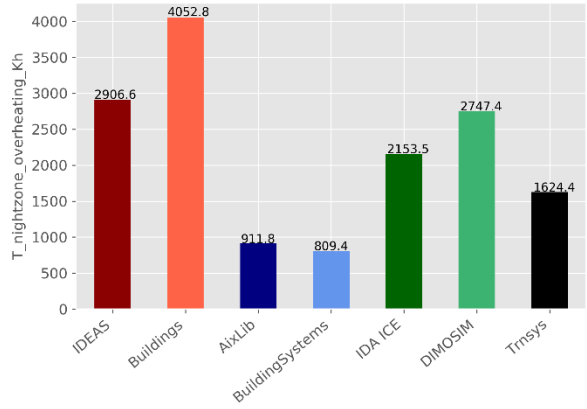


Night zone

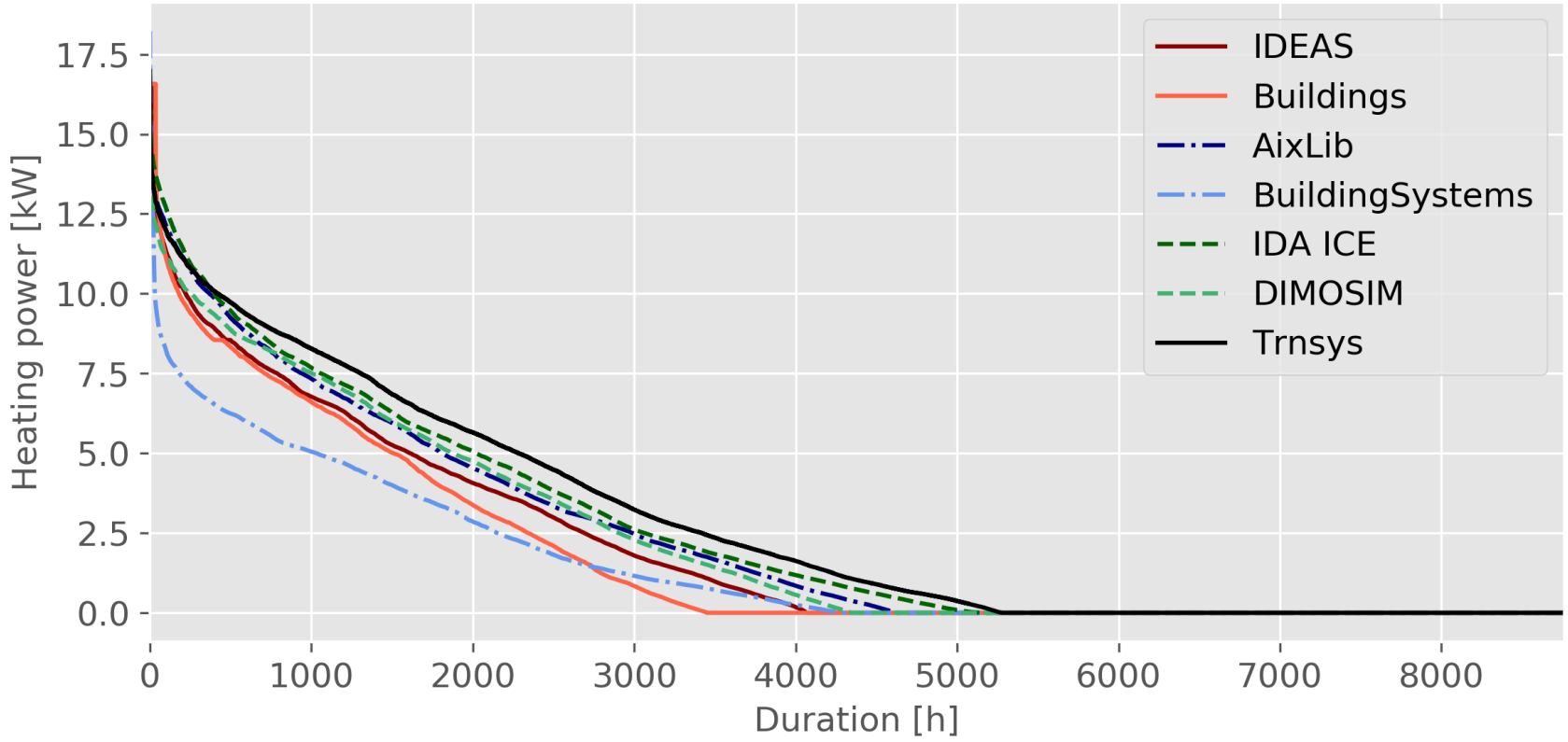




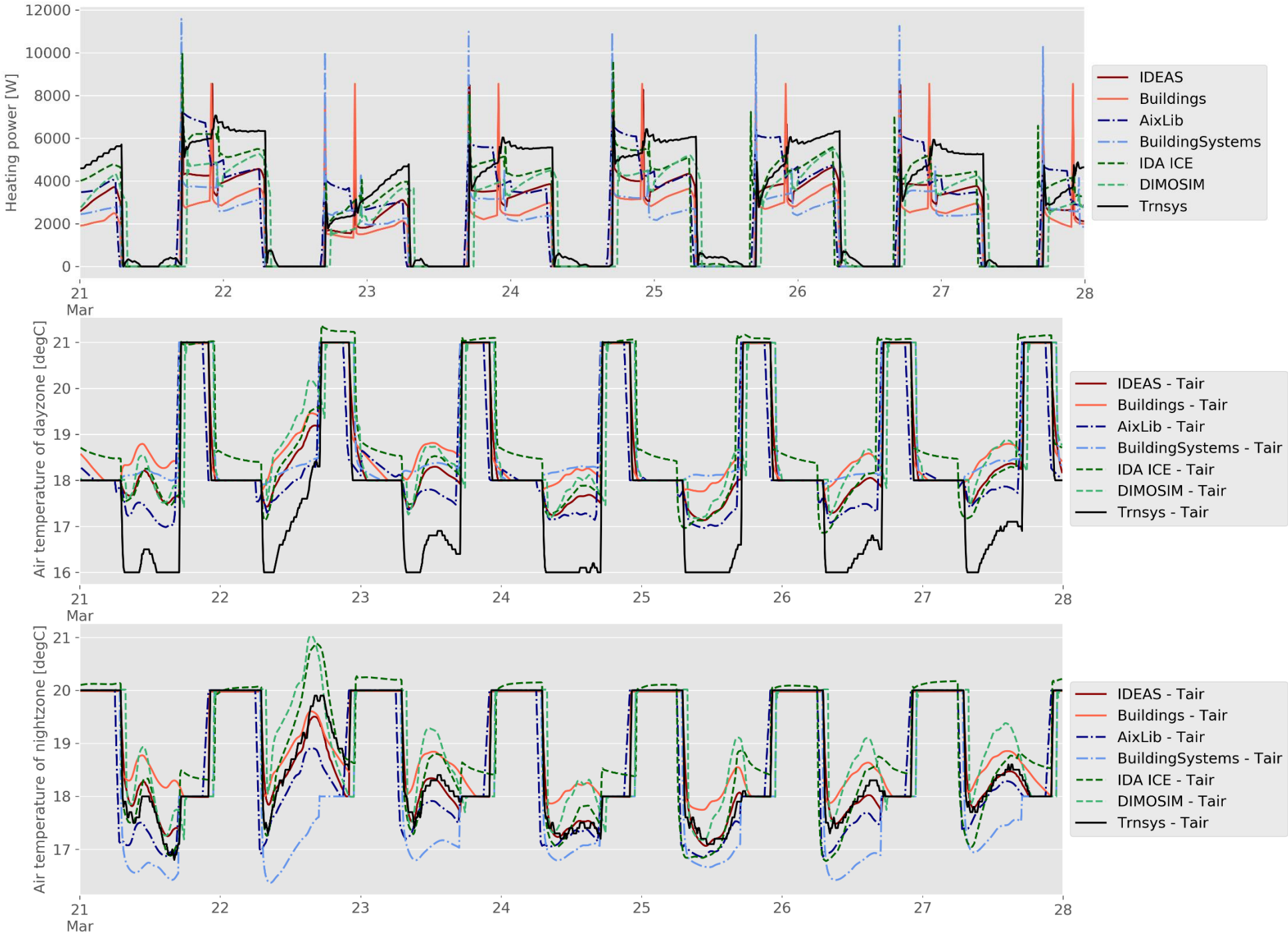




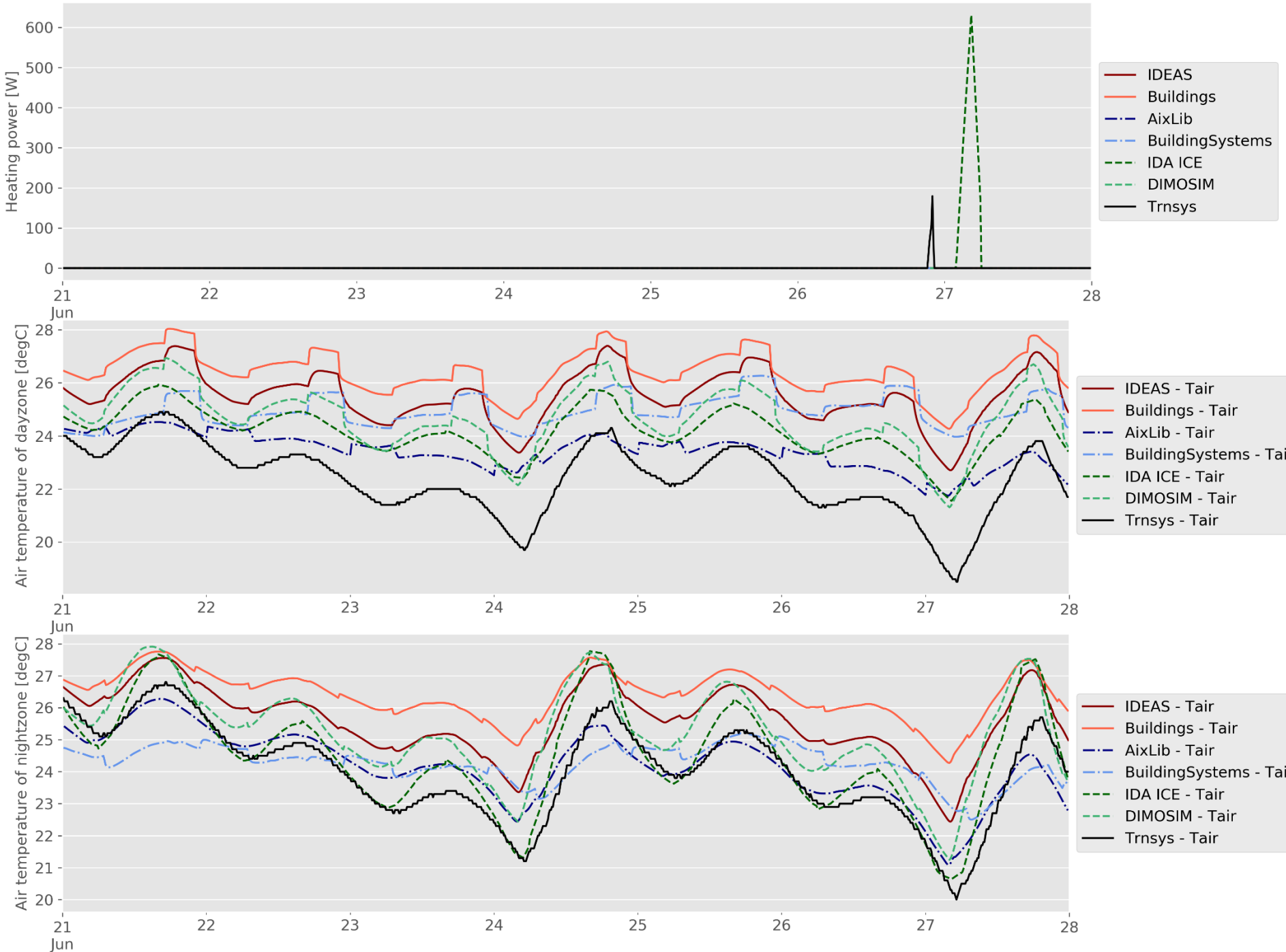
Load duration curve



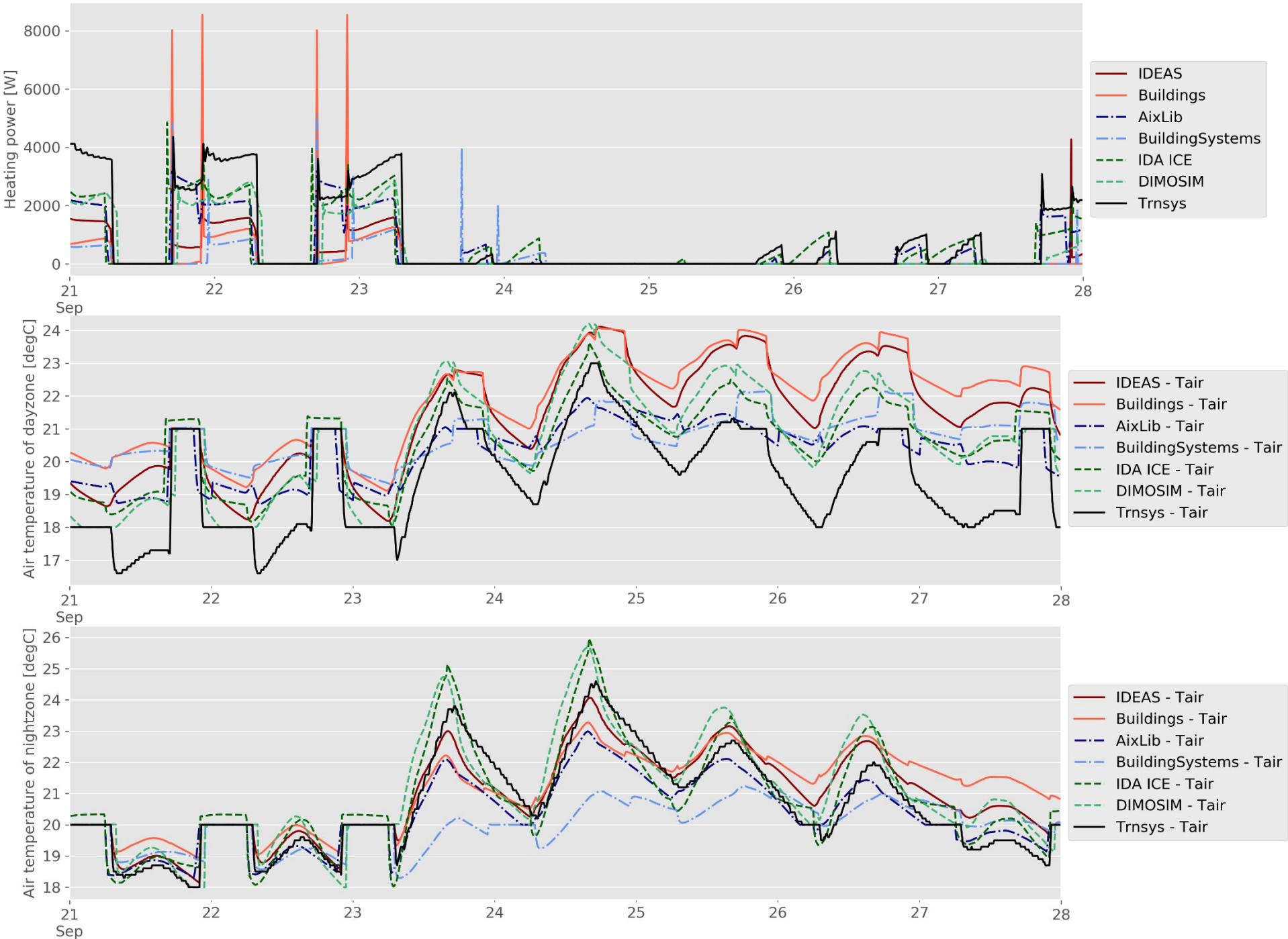
Profiles: March



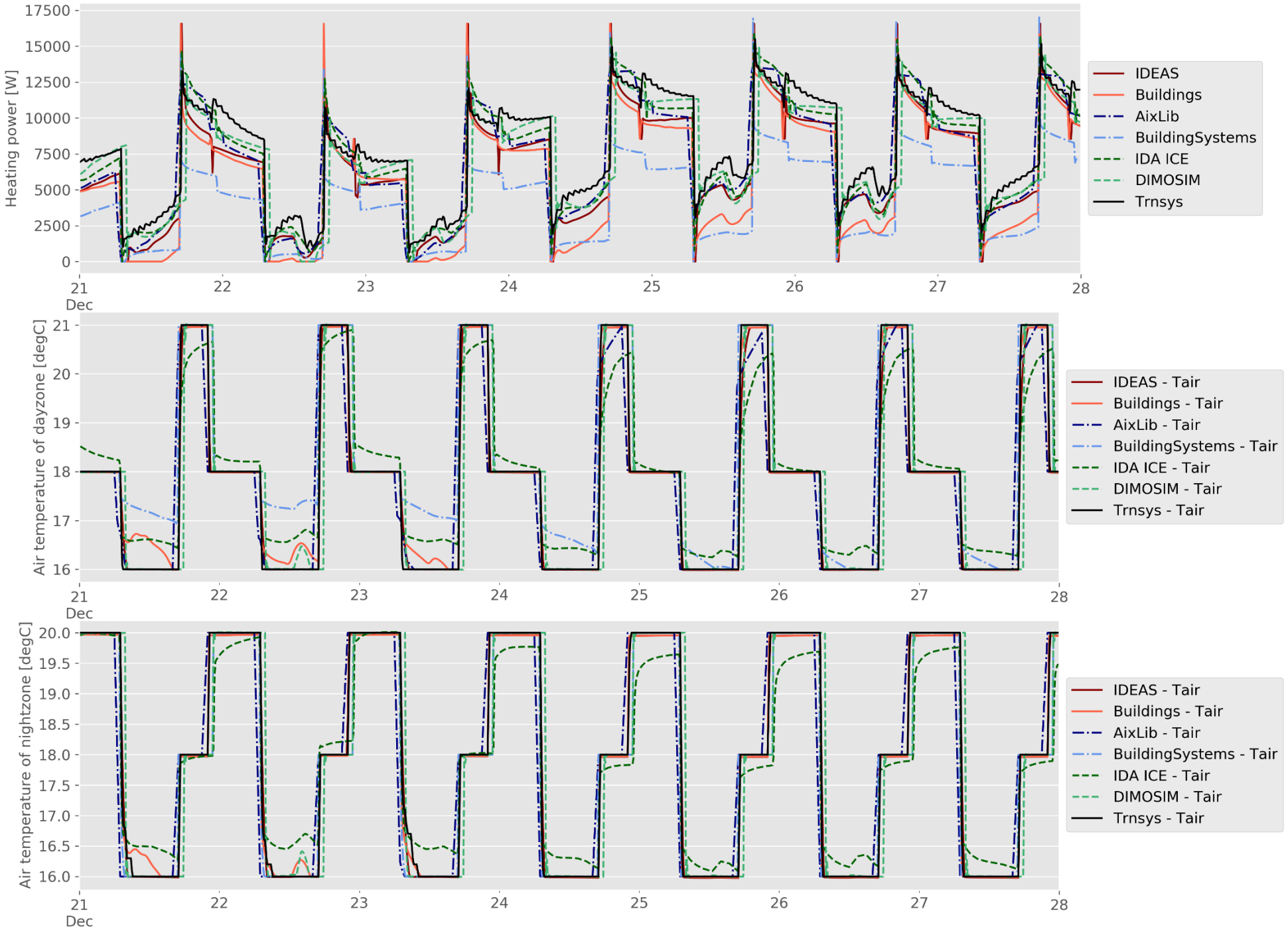
Profiles: June



Profiles: September



Profiles: December



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Building description

- Currently: teaserXML

XML Notepad - C:\Users\ina\Box Sync\Onderzoek\Projects\IBSPA Project 1\WP3_1\180323_SimpleDistrict\180323_SimpleDistrict\SimpleDistrict.teaserXML

File Edit View Insert Window Help

C:\Users\ina\Box Sync\Onderzoek\Projects\IBSPA Project 1\WP3_1\180323_SimpleDistrict\180323_SimpleDistrict\SimpleDistrict.teaserXML

Tree View | XSL Output

xml	version="1.0"
project:Project	
version	0.5
xmlns:project	http://teaser.project
xmlns:usecond	http://teaser.boundary
project:Residential	
project:name	SimpleDistrict_1
project:street_name	
project:city	
project:type_of_building	SingleFamilyDwelling
project:year_of_construction	1980
project:year_of_retrofit	None
project:number_of_floors	2
project:height_of_floors	3.5
project:net_leased_area	128.0
project:ThermalZone	
project:name	DayZone
project:area	64.0
project:volume	224.0
project:infiltration_rate	0.4
project:typical_length	3.0
project:typical_width	6.0
project:UseCondition	
project:OuterWall	
project:name	OuterWall_1_1
project:year_of_construction	1980
project:construction_type	heavy
project:area	22.4
project:tilt	90.0
project:orientation	90.0
project:inner_convection	2.7
project:inner_radiation	5.0
project:outer_convection	20.0
project:outer_radiation	5.0
project:Layer	
project:id	1
project:thickness	0.1
project:Material	
project:name	HeavyMasonryForExteriorApplications
project:density	1850.0
project:thermal_conduc	1.1
	0.84

Error List | Dynamic Help

Description | File | Line | Column

ENG 21:15

Building description

- Currently: teaserXML
- Issues: multiple items not yet included
  - See listed issues in Google Spreadsheet

Building description

- Currently: teaserXML
- Issues: multiple items not yet included
  - See listed issues in Google Spreadsheet

- Alternatives:
  - CityGML + EnergyADE
  - GeoJSON
  - …

    → Discuss with WP2?

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Report

- Annex 60 report as a basis
- First outline by Ina

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Future work

- Replace nodes with other loads
  - Automated model generation with TEASER
    - Other types of single-family dwellings
    - Apartment block
    - Office building
  - Usage of different construction standards and countries
  - Usage of different boundary conditions (e.g. occupant, …)
  - …
- Change network layout

TO DOs

- Define format
  - + put single building into this format
- Write report
  - How to divide the work?
- Future steps
  - …

Influence of different solvers?

- Influence for building is small

	Peak power [kW]	Heating use [kWh]	Overheating dayzone [Kh]	Overheating nightzone [Kh]	Simulation time of 1 building [s]
Dassl	16.573	20184.445	3111.022	3126.092	278.756
Lsodar	16.573	20185.062	3110.880	3125.967	529.070
Cvode	16.573	20184.576	3110.530	3125.637	294.714