ENERGY AND BUILDINGS
2021 – 2022

OpenStudio - Simulation

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Practical info

Installation guidelines file

[Google doc](https://docs.google.com/document/d/1PrbHYNKNaYRu0pPOKa5YK-MYZ2CjoabTDx8nm5rcyZY/edit) for questions https://docs.google.com/document/d/1PrbHYNKNaYRu0pPOKa5YK-MYZ2CjoabTDx8nm5rcyZY/edit

Questions and answer meeting on Thursday 14:30, Seminar room (ex Fisica Tecnica)

Information about the report in moodle. After the practical lectures there will an in-depth explanation of the report.

Design of the model

1 - Geometry definition

2 – Input definition
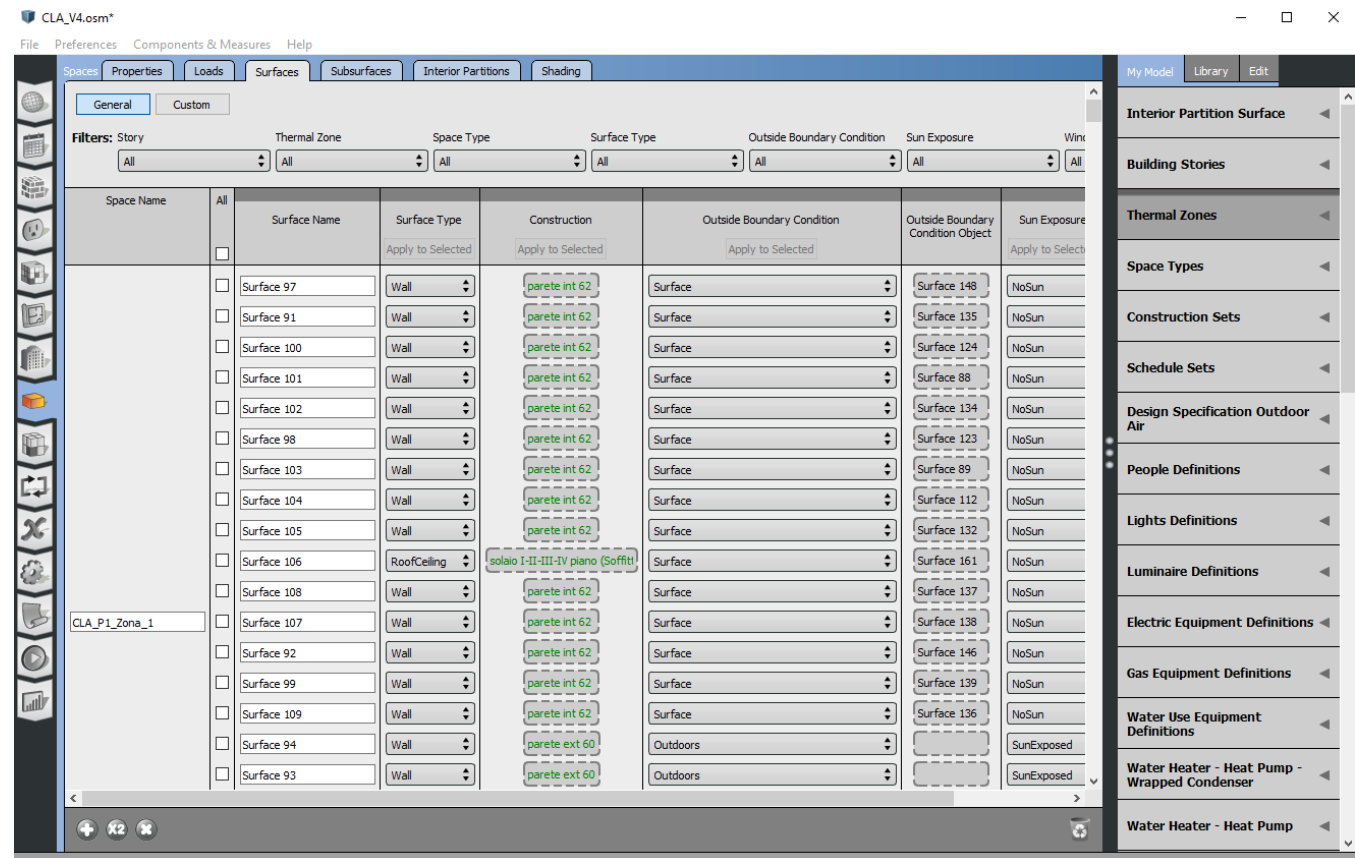
3 - Output definition & Simulation

4 - Analysis of the results

Final settings and simulation
Connect input to spaces and thermal zones
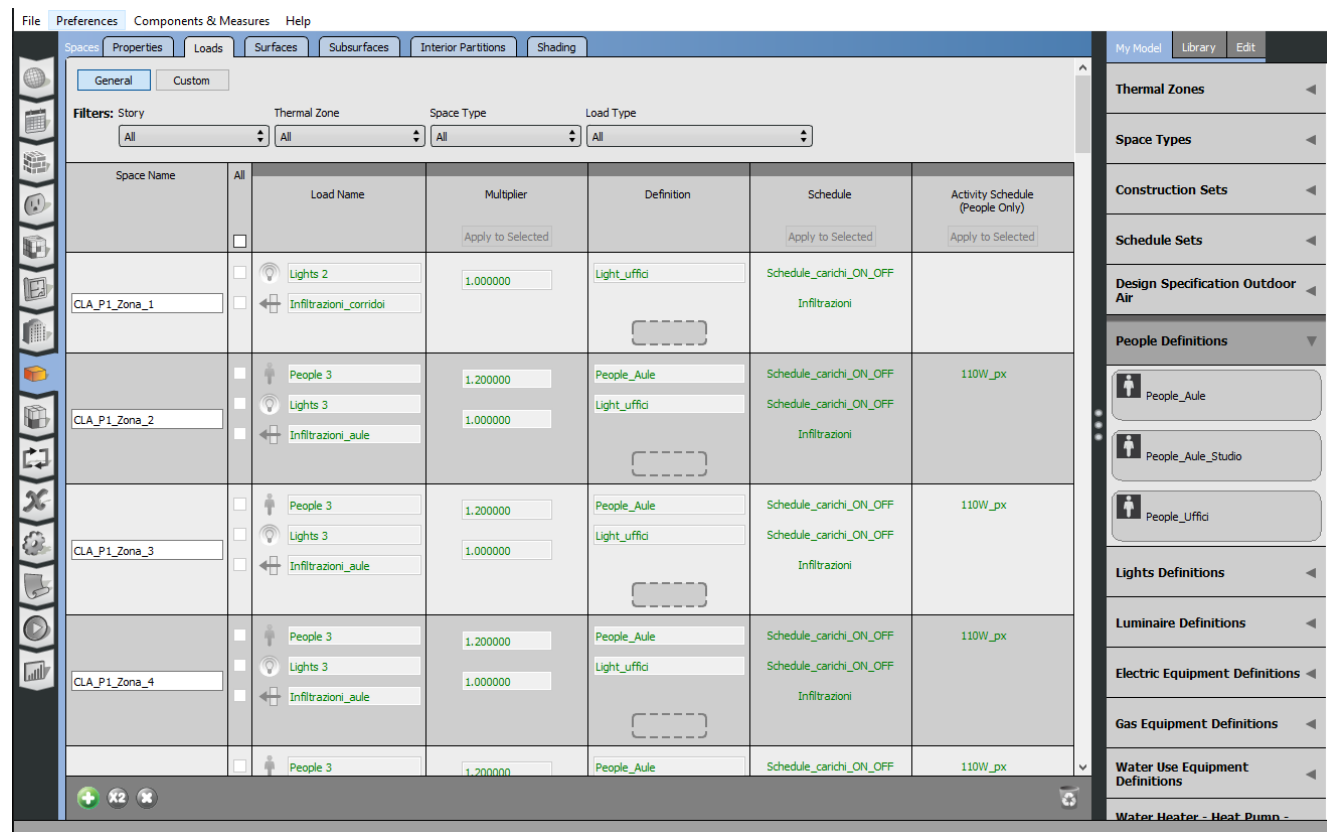## Set output variables and settings
Simulation

Surfaces

1   Spaces/Surfaces tab

2   «My model» panel (right side)

2   Check surfaces properties

3   Eventually modify them

Loads

1   Spaces/Loads tab

2   «My model» panel (right side)

3   Drag and drop previously created loads and schedules in the corresponding space

Infiltration

Library
Space Infiltration Design Flow Rates
Drag and drop in the spot

Typical value:
0.3 Vol/h (old windows)
0.2 Vol/h (new windows)

Thermal zone

1. Set setpoint schedules

2. Turn on ideal loads where needed

3. Associate thermal zones to spaces

Settings

1. Time-steps per hour: 4 or 6

2. Only simulation for Run periods (do not check sizing options)

3. Select output variables

Output of the lecture

1. Open Studio simulation must be running without errors

2. The «Table» shows:
   - District Heating energy demand
   - Possibly the specific value in kWh/(m² y) must be realistic according to the guidelines given in the report's guidelines

3. DView: Zone temperature, Operative Temperature, Space heating energy demand

After the simulation

Check the log file!!

model_name.err

Do you have any geometry issue?? Fix it!

Fix all the other severe errors and relevant warnings

Typical errors

1. Check the order of the envelope stratigraphy!

2. Verify that Internal floor and ceiling have the same stratigraphy, but reverse order (Inside vs Outside layer) in the Constructions Label

3. Check surfaces' boundary conditions

4. Schedules assignments

5. Activity Level missing

6. Check Priority definition in the schedules

7. Did you associate Spaces and Thermal Zones?

8. Double check that each construction is correctly assigned to the correspoding surface/sub-surface

After the simulation

When your log file looks ok, move to the results

See the openstudio *Results Summary* tab

or *model_name.html*

Check zone properties, and surfaces properties

(U-value)

After simulation

Output variables to check from OpenStudio

1. Schedules (Zone electric equipment total heating rate, Zone lights total heating rate, Zone people occupant count, Zone people sensible heating rate, …)

2. Zone Operative Temperature (Hourly)

3. Zone Mean Air Temperature (Hourly)

4. Zone Relative Humidity (Hourly)

5. Site Outdoor Air (Hourly) (already set by the software)

6. Annual Heating/Cooling (sensible and latent) energy demand (Hourly) (already set by the software)

OpenStudio – TIPS and Useful Info

http://nrel.github.io/OpenStudio-user-documentation/getting_started/getting_started/#introductory-tutorial