week6_TPletneva

11 ноября 2019 г. 22:14

Task 1: Considering the same example you solved in the previous assignment (radiative heat transfer between two parallel plates), how many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields ?

Q_12,n shields = (Aσ((T_1)^4-(T_2)^4))/(N+1)((1/∈_1)+(1/∈_2)-1)

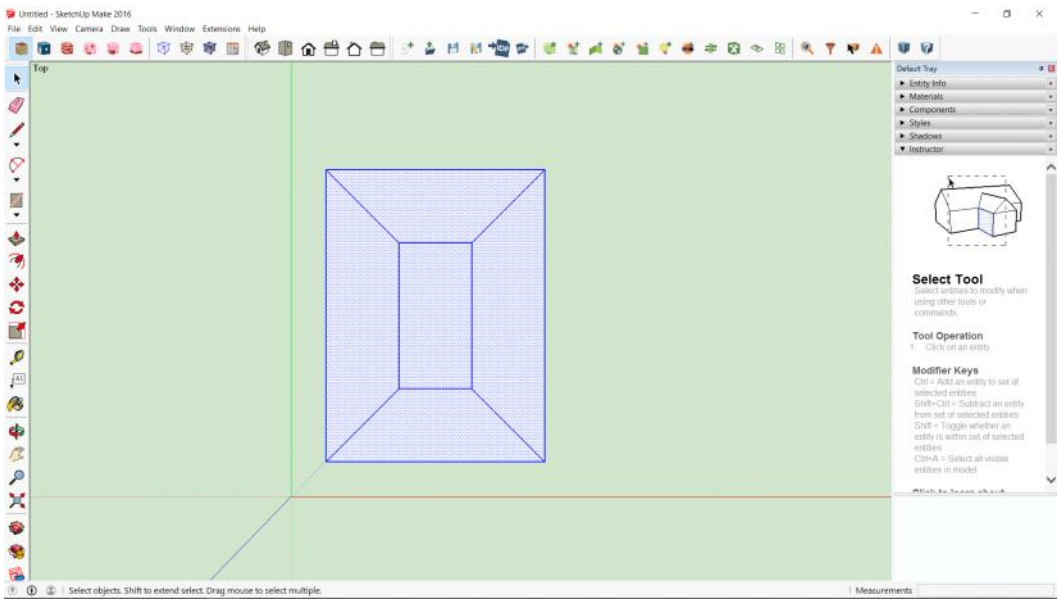
> Q12,n shields = (1/(N+1))*Q_12,no shields

> N=1*(Q_12,no shields/Q_12, n shields)-1

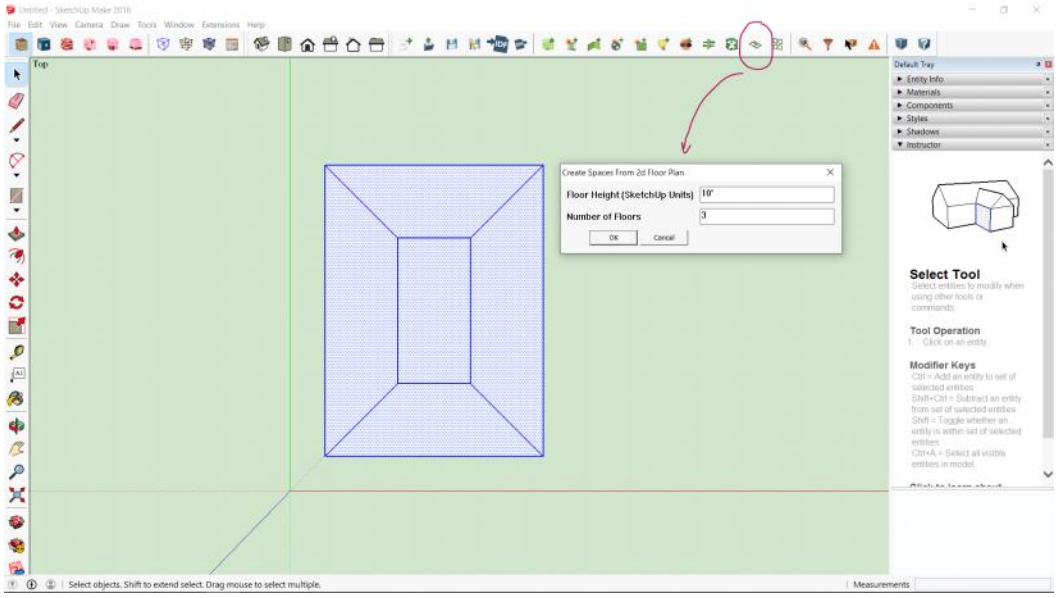
> N=1 (100%/1%) -1 = **99**

Task 2: You should create a pdf file with screenshots of all of the steps we went through (clearly from your own file) and explain briefly the reason behind the use of each step (in your own words!)

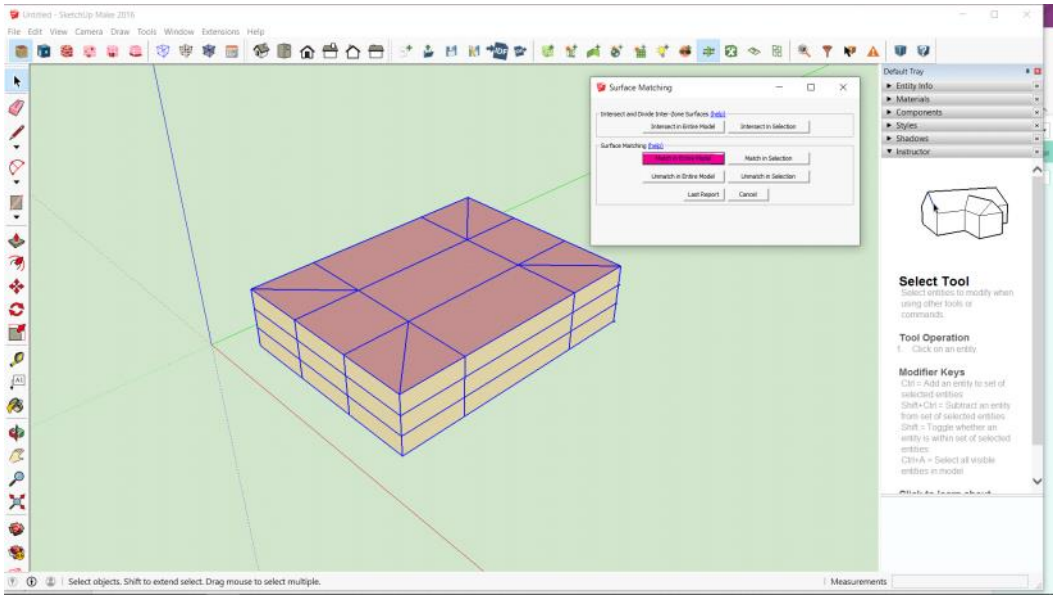
1. Creating a diagram of the future building (30*40m).
   Offsetting 10m on the inside and connecting the edges with lines.



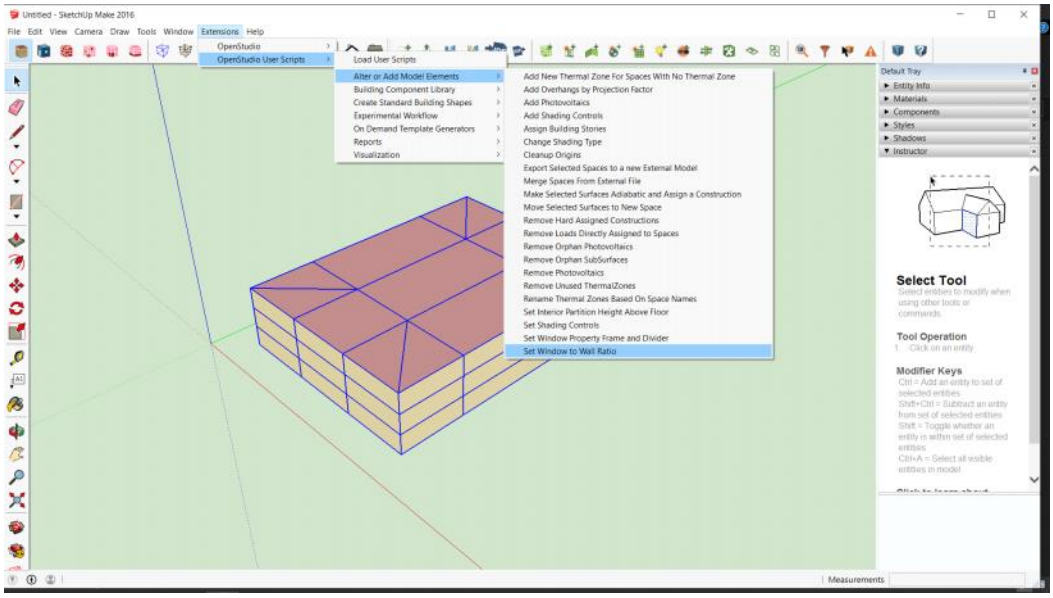
2. OpenStudio panel > Create Spaces from diagram.
   This tool lets create a building volume out of a plan.



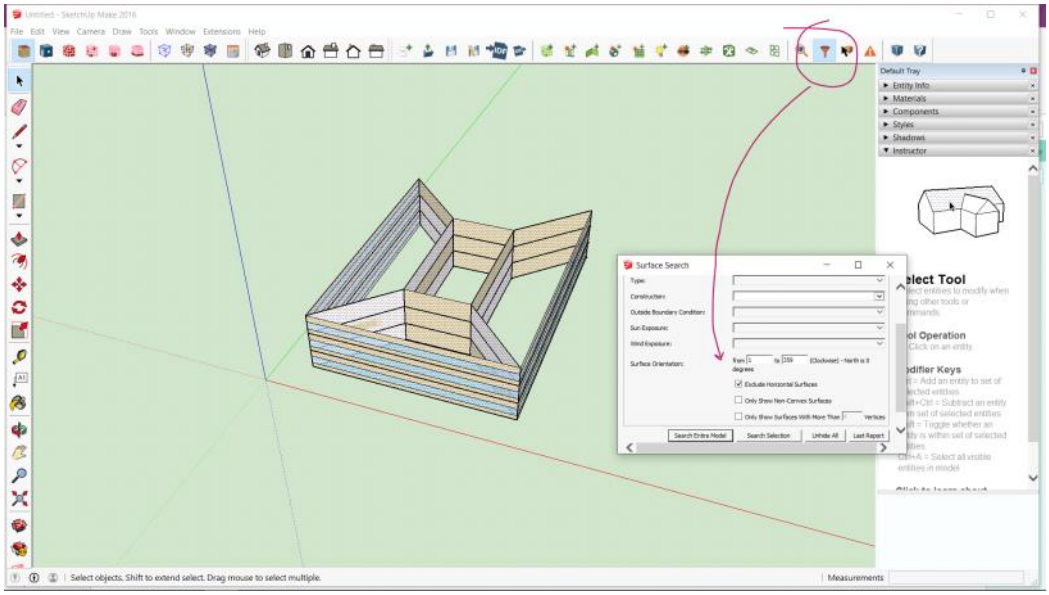
3. OpenStudio panel > Surface matching tool.
   With this operation we separate facades from the roof.



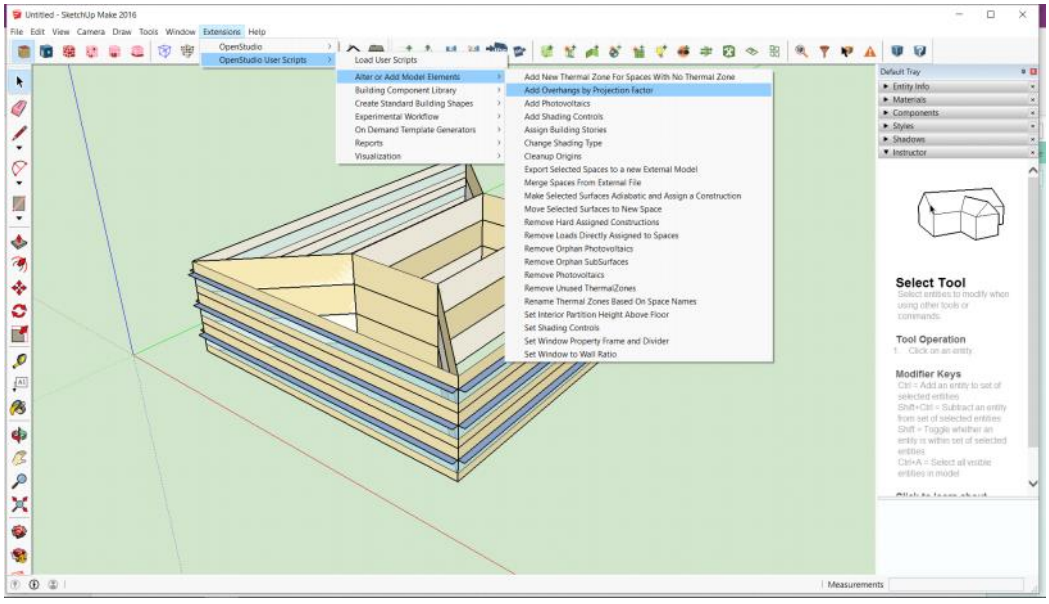
4. Adding windows using OpenStudio user scrips.



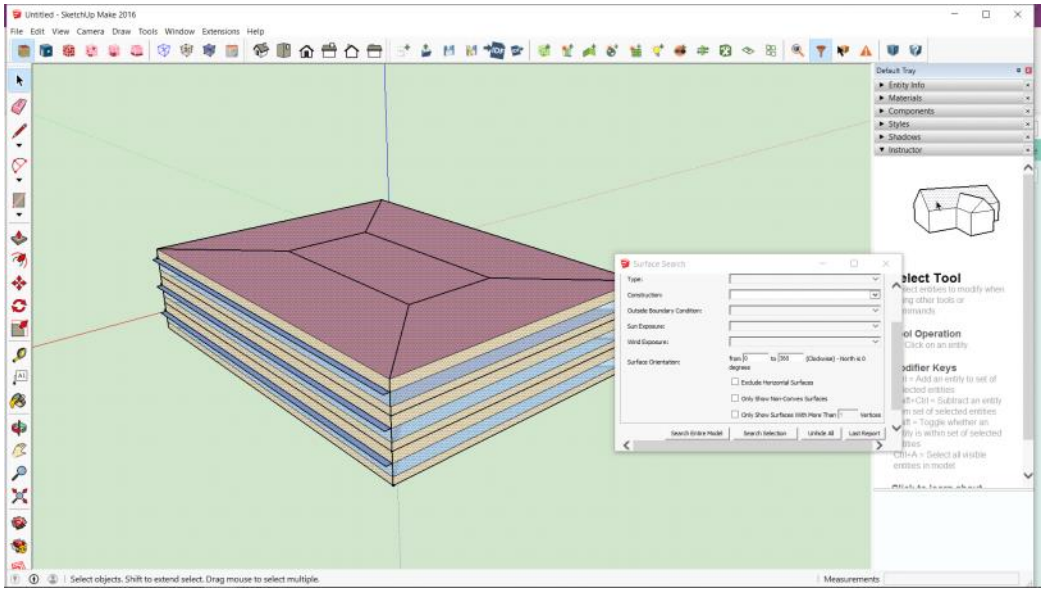
5. Selecting all facades except the northern ones using the angle between 0-360.



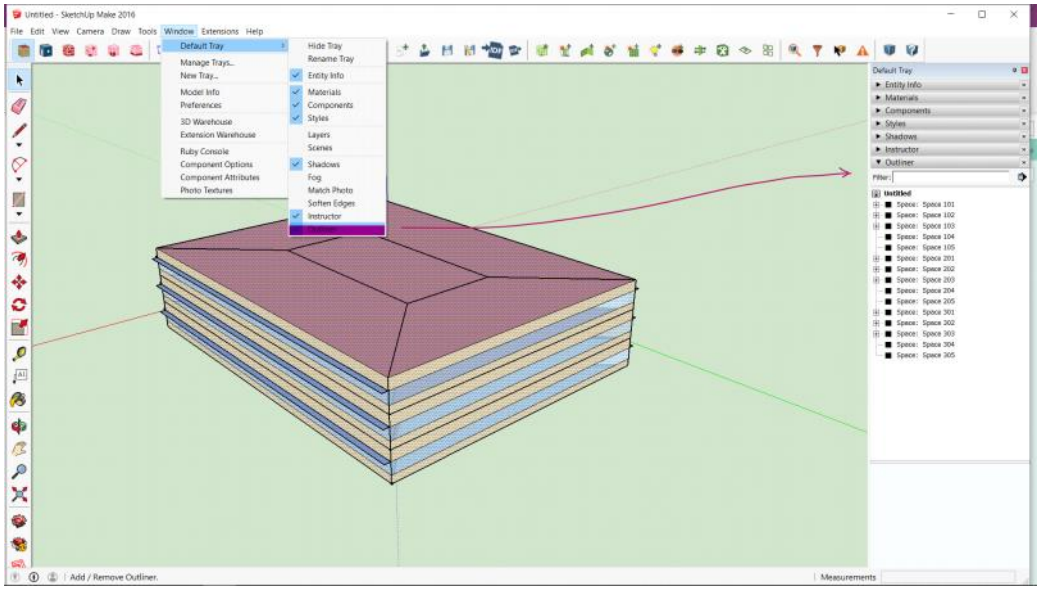
6. Adding overhangs to the selected facades.



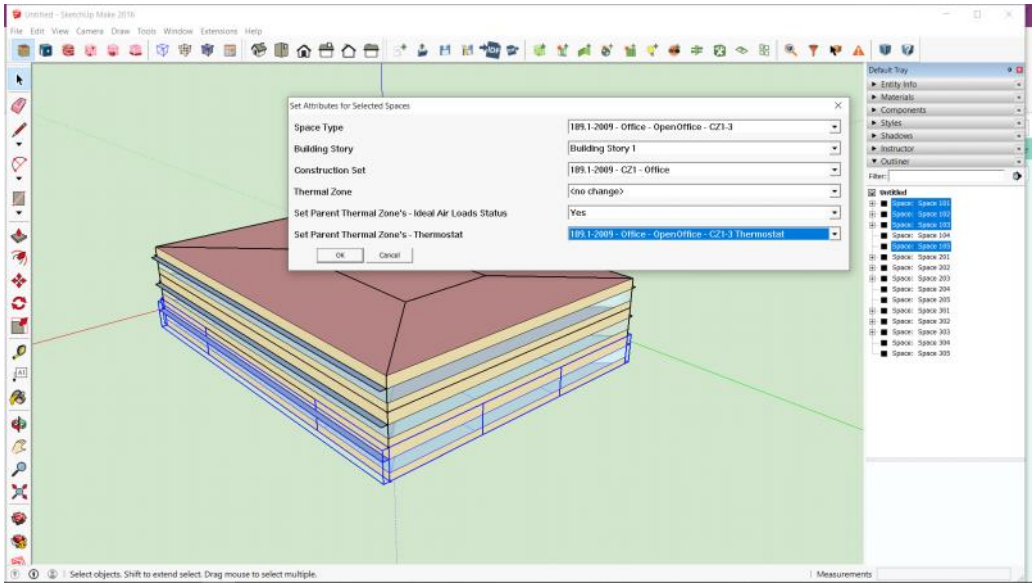
7. Returning back all the surfaces hidden before typing in the range of 0-360.



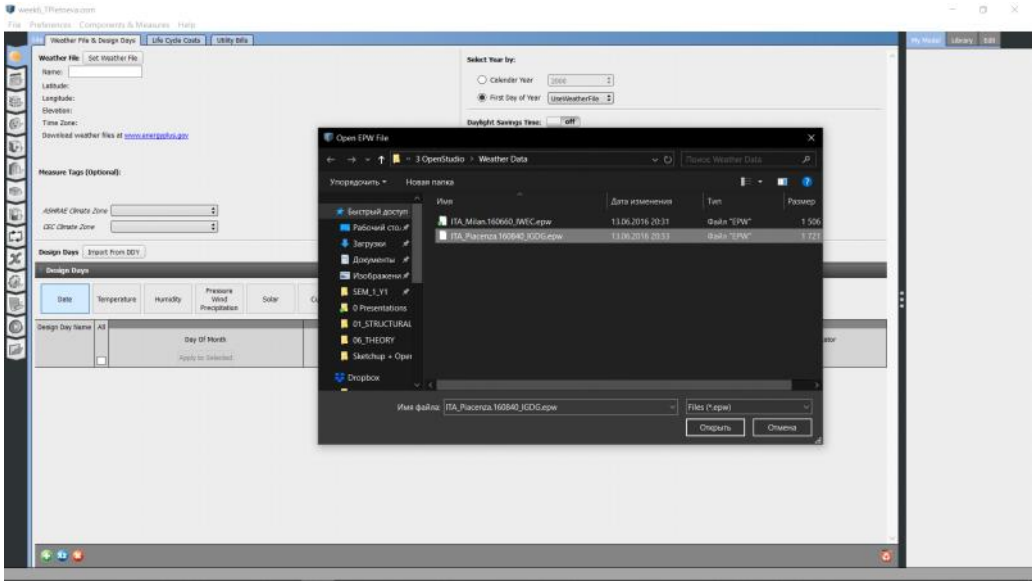
8. Opening "Outliner" tab in the default tray. We need it to add specifications for each thermal zone.



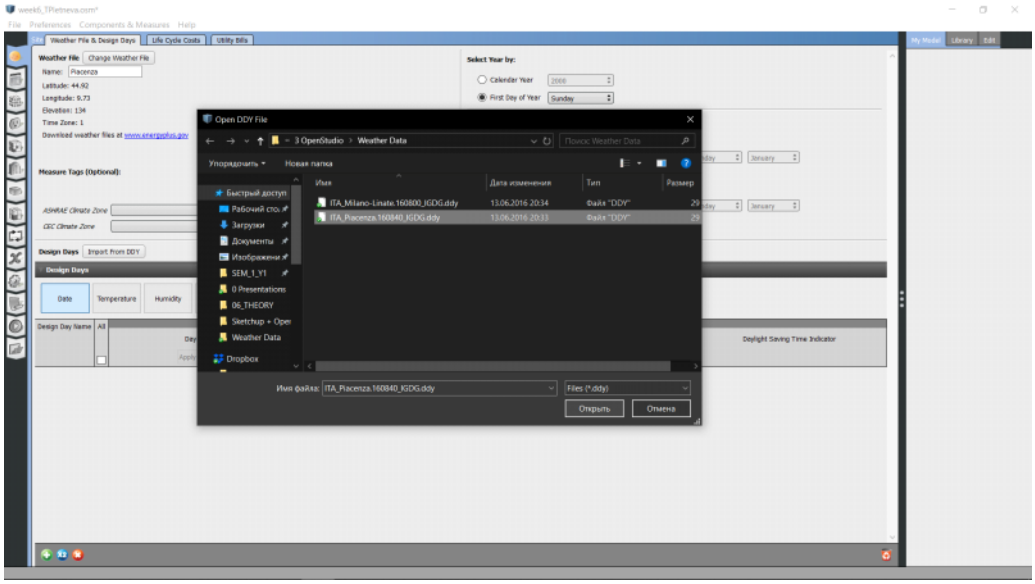
9. Setting attributes for selected zones.



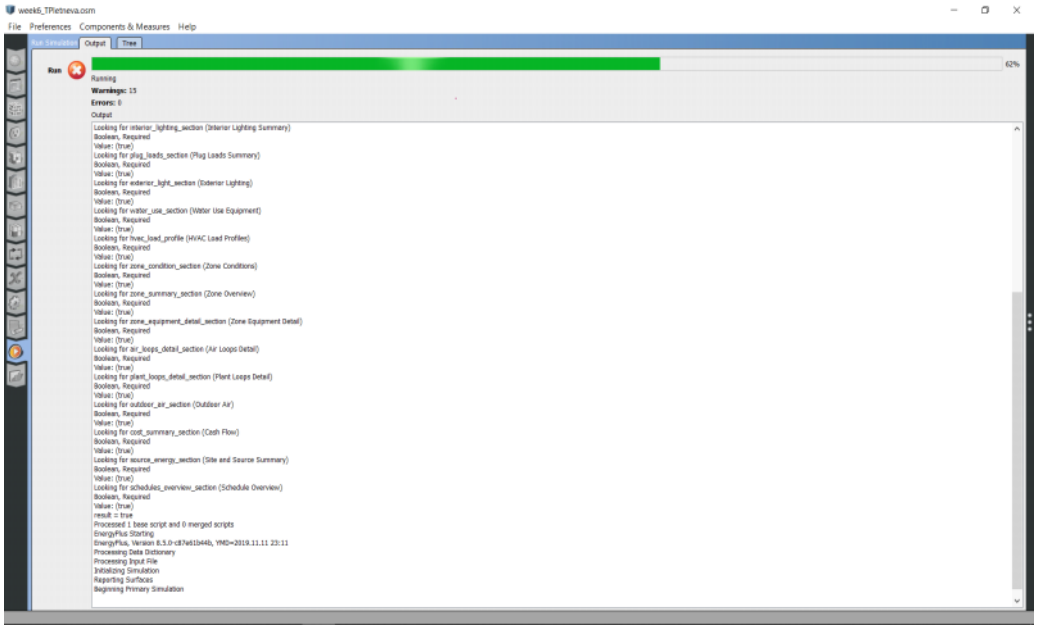
10. Opening the saved model in OpenStudio to set the weather data. Choosing "Piacenza" file.



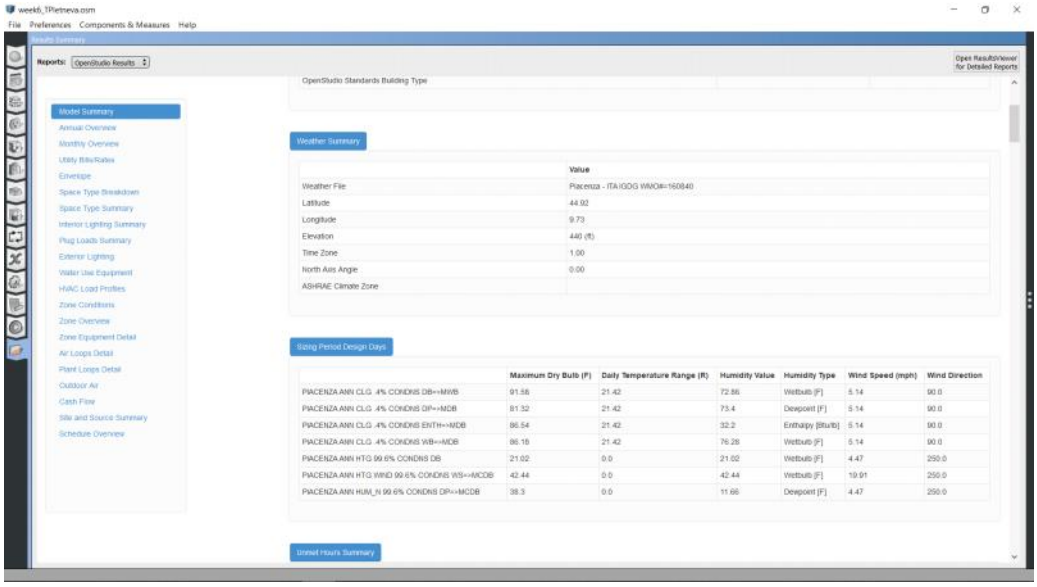
11. Import from DDY > Piacenza.ddy

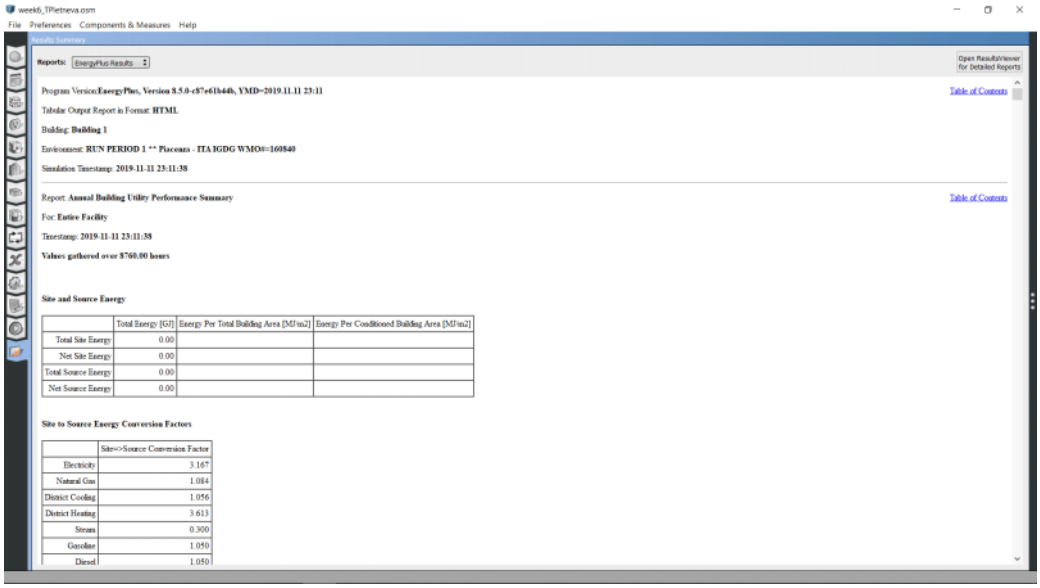


11. Running the simulation. If errors appear the attributes set through Sketchup should be checked.



12. Viewing the results of simulation. OpenStudio/EnegryPlus.


week6_TPletneva.osm
File Preferences Components & Measures Help
Reports: OpenStudio Results
Open ResultsViewer for Detailed Reports
OpenStudio Standards Building Type
Model Summary
Annual Overview
Monthly Overview
Utility Bills/Rates
Envelope
Space Type Breakdown
Space Type Summary
Interior Lighting Summary
Plug Loads Summary
Exterior Lighting
Water Use Equipment
HVAC Load Profiles
Zone Conditions
Zone Overview
Zone Equipment Detail
Air Loops Detail
Plant Loops Detail
Outdoor Air
Cash Flow
Site and Source Summary
Schedule Overview
Weather Summary
Value
Weather File
Piacenza - ITA IGDG WMO#=160840
Latitude
44.92
Longitude
9.73
Elevation
440 (ft)
Time Zone
1.00
North Axis Angle
0.00
ASHRAE Climate Zone
Sizing Period Design Days
Maximum Dry Bulb (F)
Daily Temperature Range (R)
Humidity Value
Humidity Type
Wind Speed (mph)
Wind Direction
PIACENZA ANN CLG .4% CONDNS DB=>MWB
91.58
21.42
72.86
Wetbulb [F]
5.14
90.0
PIACENZA ANN CLG .4% CONDNS DP=>MDB
81.32
21.42
73.4
Dewpoint [F]
5.14
90.0
PIACENZA ANN CLG .4% CONDNS ENTH=>MDB
86.54
21.42
32.2
Enthalpy [Btu/lb]
5.14
90.0
PIACENZA ANN CLG .4% CONDNS WB=>MDB
86.18
21.42
76.28
Wetbulb [F]
5.14
90.0
PIACENZA ANN HTG 99.6% CONDNS DB
21.02
0.0
21.02
Wetbulb [F]
4.47
250.0
PIACENZA ANN HTG WIND 99.6% CONDNS WS=>MCDB
42.44
0.0
42.44
Wetbulb [F]
19.91
250.0
PIACENZA ANN HUM_N 99.6% CONDNS DP=>MCDB
38.3
0.0
11.66
Dewpoint [F]
4.47
250.0
Unmet Hours Summary


week6_TPletneva.osm
File Preferences Components & Measures Help
Reports: EnergyPlus Results
Open ResultsViewer for Detailed Reports
Program Version:EnergyPlus, Version 8.5.0-c87e61b44b, YMD=2019.11.11 23:11
Table of Contents
Tabular Output Report in Format: HTML
Building: Building 1
Environment: RUN PERIOD 1 ** Piacenza - ITA IGDG WMO#=160840
Simulation Timestamp: 2019-11-11 23:11:38
Report: Annual Building Utility Performance Summary
Table of Contents
For: Entire Facility
Timestamp: 2019-11-11 23:11:38
Values gathered over 8760.00 hours
Site and Source Energy
Total Energy [GJ]
Energy Per Total Building Area [MJ/m2]
Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy 0.00
Net Site Energy 0.00
Total Source Energy 0.00
Net Source Energy 0.00
Site to Source Energy Conversion Factors
Site=>Source Conversion Factor
Electricity 3.167
Natural Gas 1.084
District Cooling 1.056
District Heating 3.613
Steam 0.300
Gasoline 1.050
Diesel 1.050