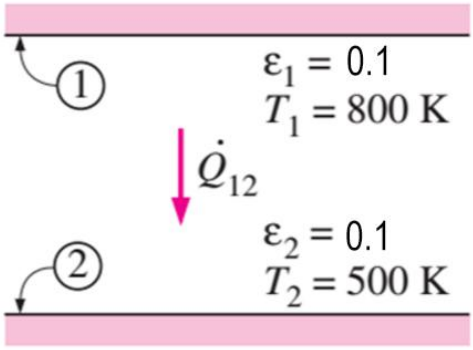
Week 6 --- Kou Yu

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 ?

$$qnet12 = \frac{Qnet12}{A} = \frac{A\sigma\,(T_2^4 - T_1^4)}{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1}$$

$$= \frac{1.5 \times (5.67 \times 10^{-8}) \times (500^4 - 800^4)}{\frac{1}{0.2} + \frac{1}{0.7} - 1} \approx 3625.41W$$



the new heat transfer rate to be 1% of the case without shields

$$Q_{12,\,N\text{shield}} = \frac{1}{N+1} Q_{12,\,N\text{shield}}$$

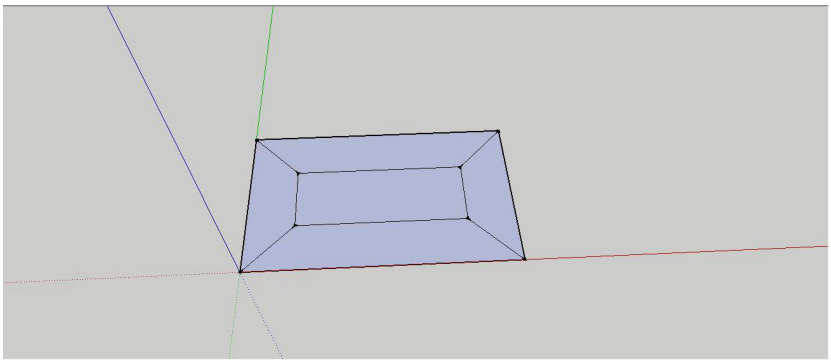
$$0.01 \times 3625.41 = \frac{1}{N+1} \times 3625.41$$

$$N = 99$$

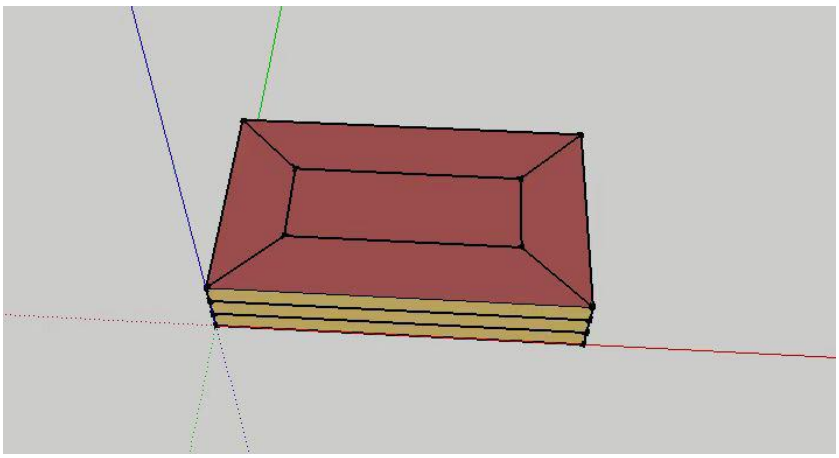
According to the value above, we need to add 99 pieces of shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields.

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!)

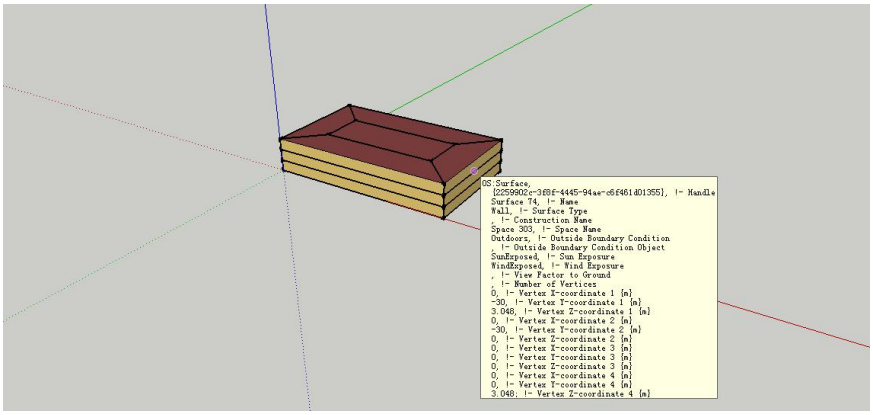
1.Create a rectangle of 40x30m and Create an offset of 10 m and
connect the edges



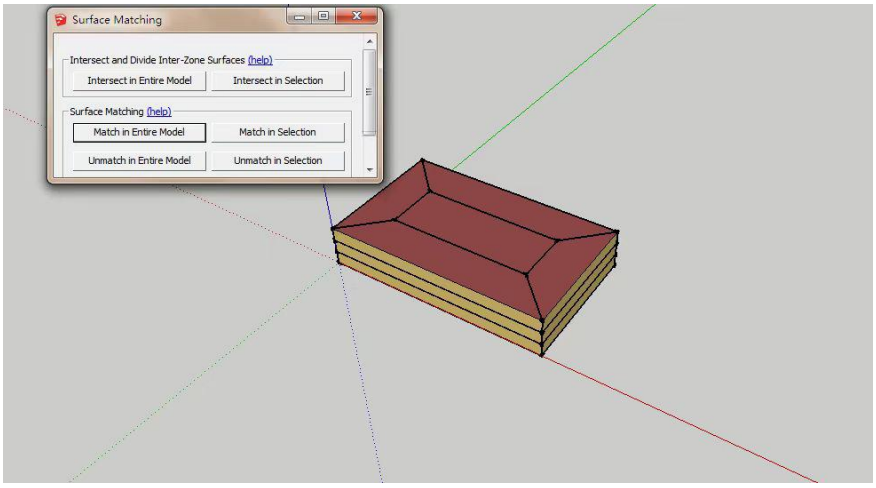
2.created the building of 3 floor



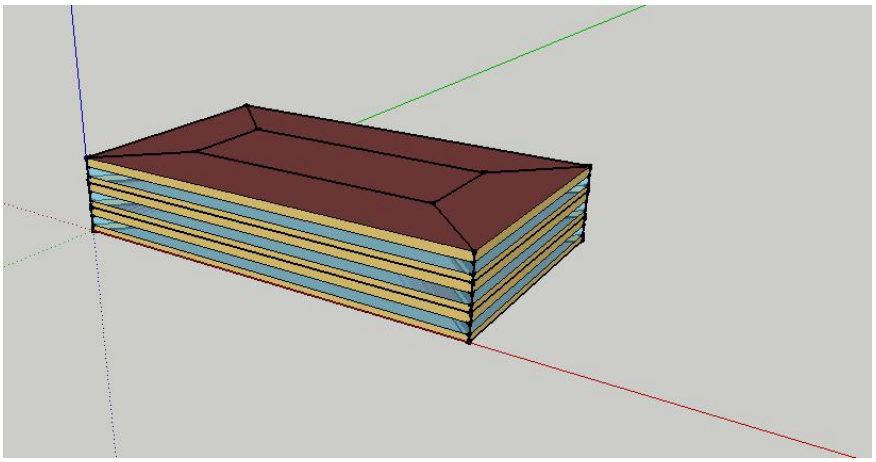
3. We can check every details



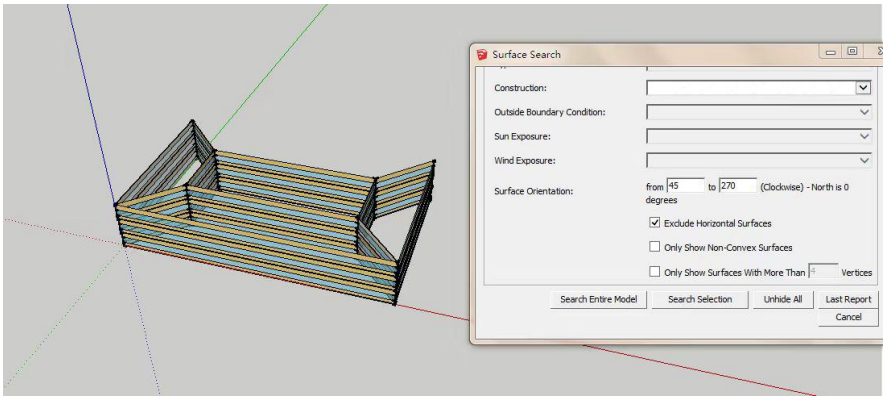
4. Click”Surface matching”



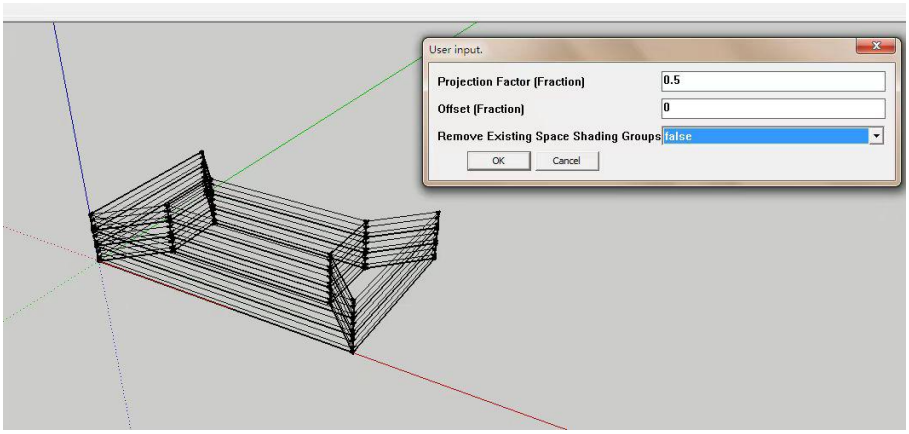
5. Adding the windows



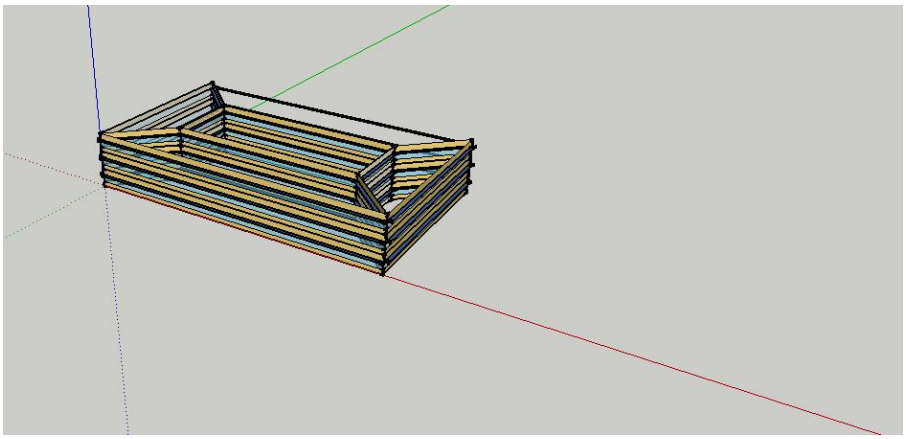
6. Selecting all surfaces excepting north



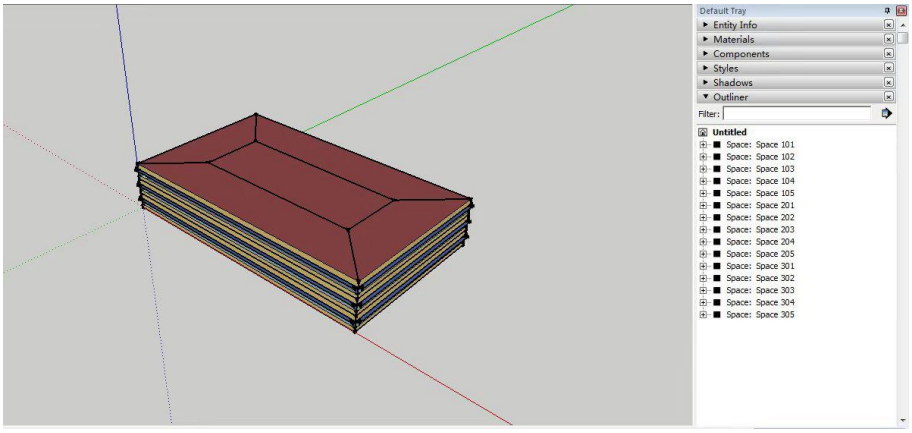
7. Built overhangs.



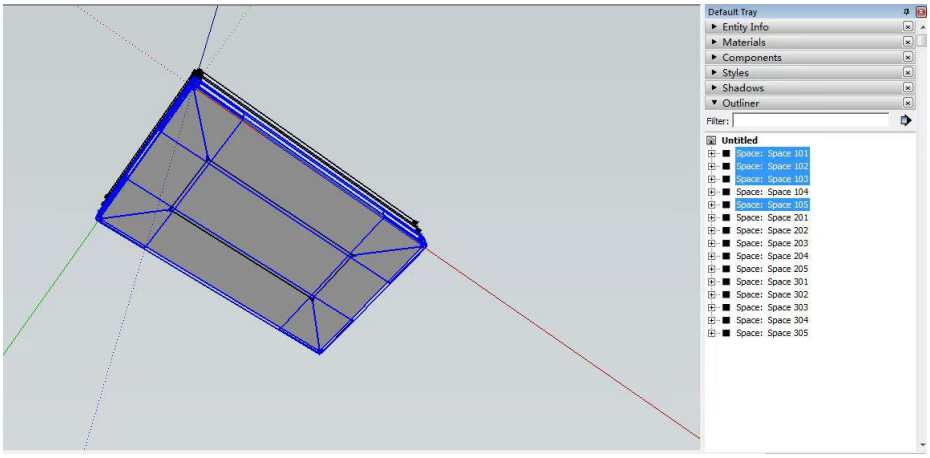
8. Back

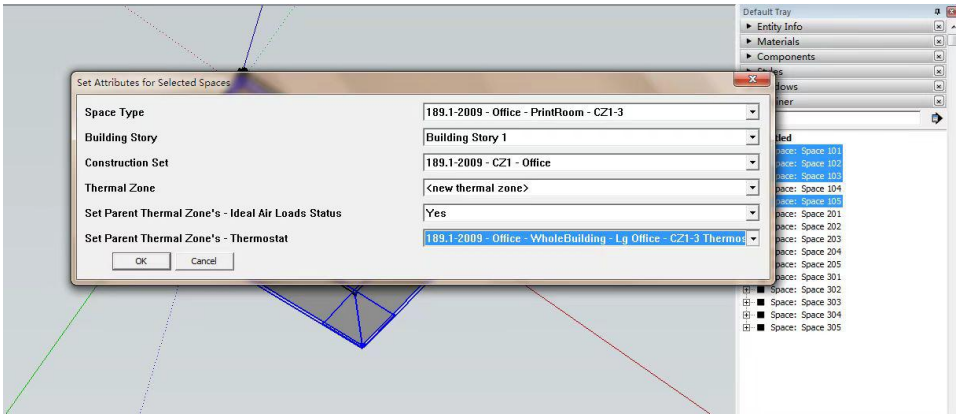


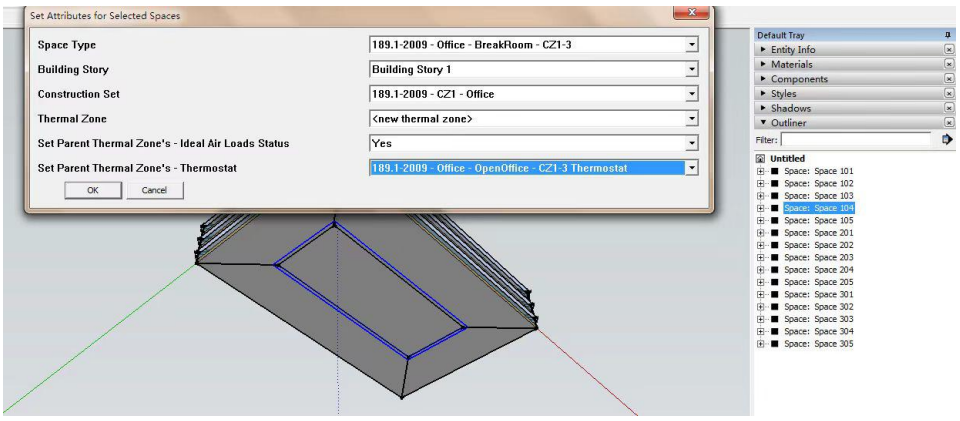
9. Open the “Window-Default Tray-Outliner



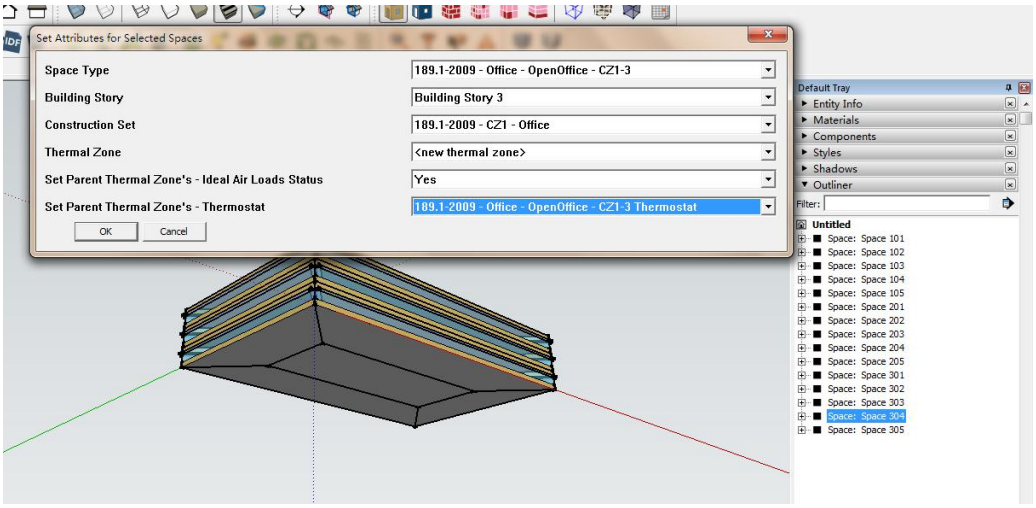
9. Choose the space of each thermal zone.



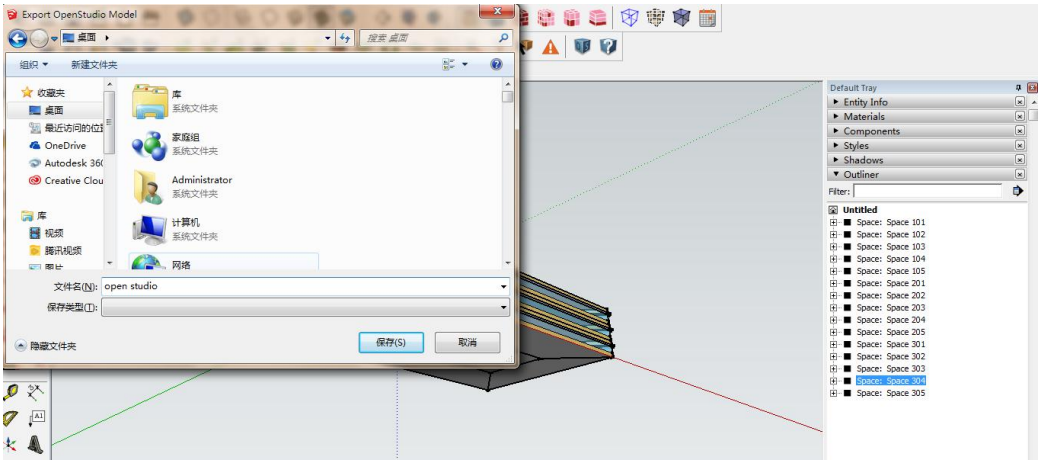




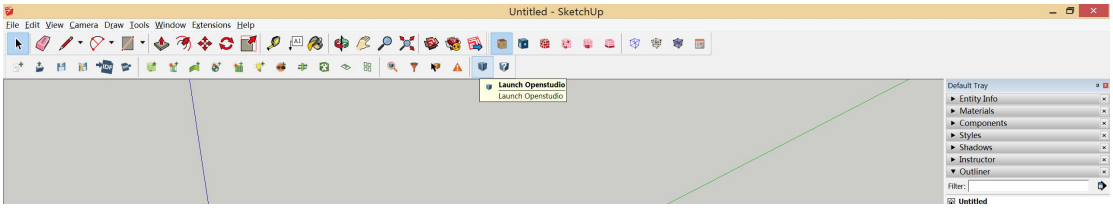
10. Click “Set Attributes for Selected Space” to set parameters



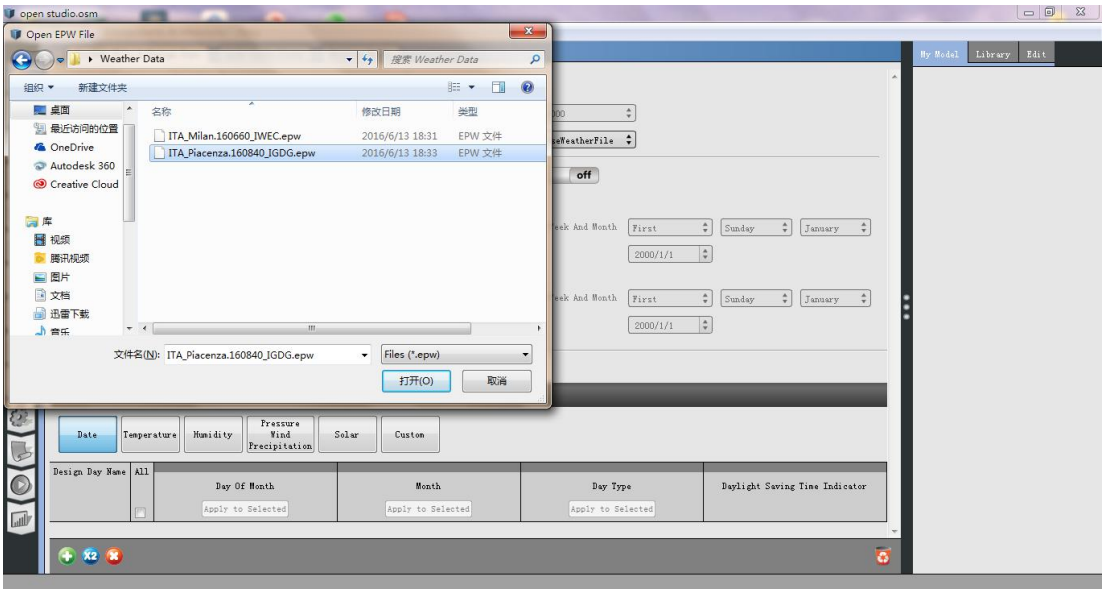
11. Save the model.



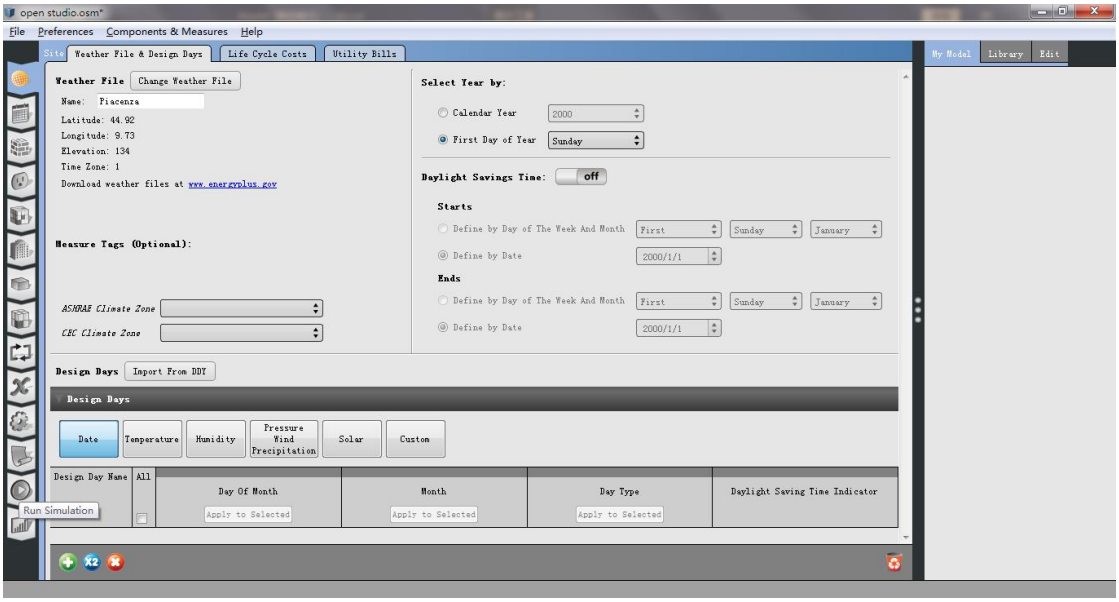
12. Click the “Launch Openstudio”.

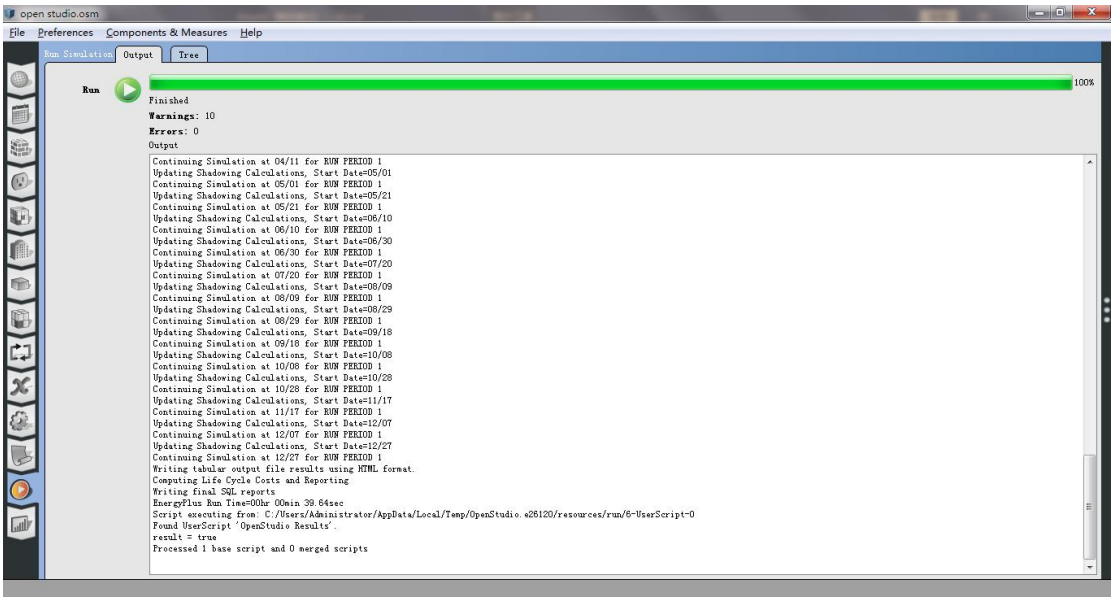


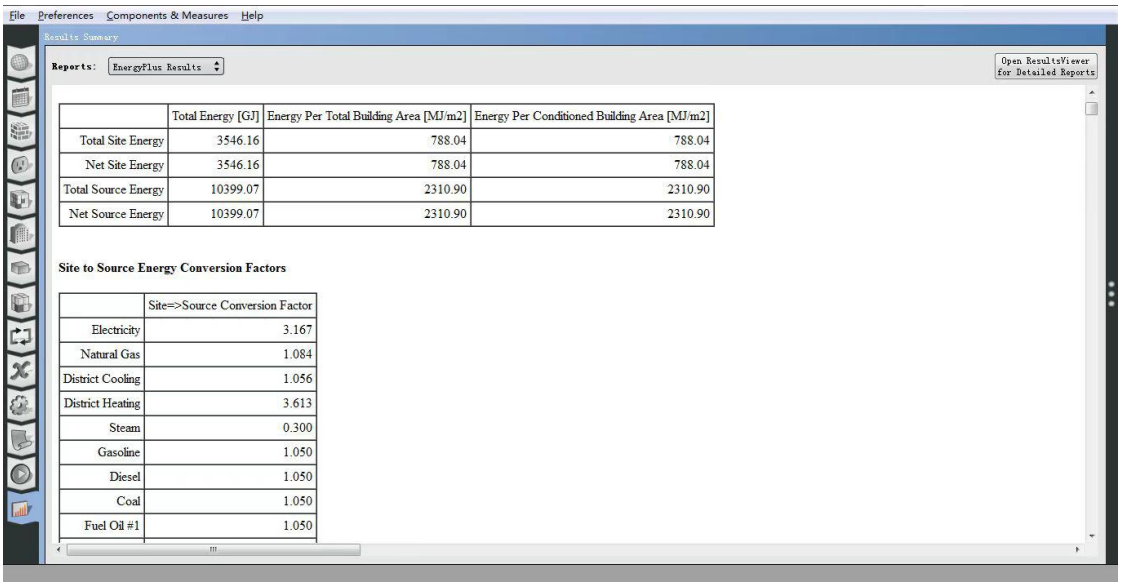
13. Add the weather data.



14. Click the “Run Simulation”.



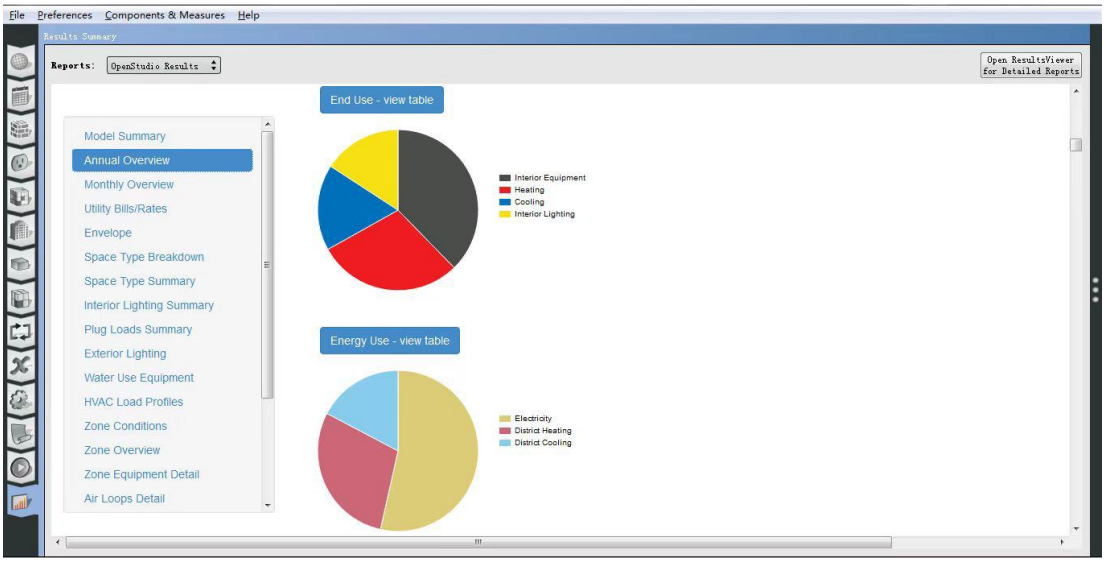


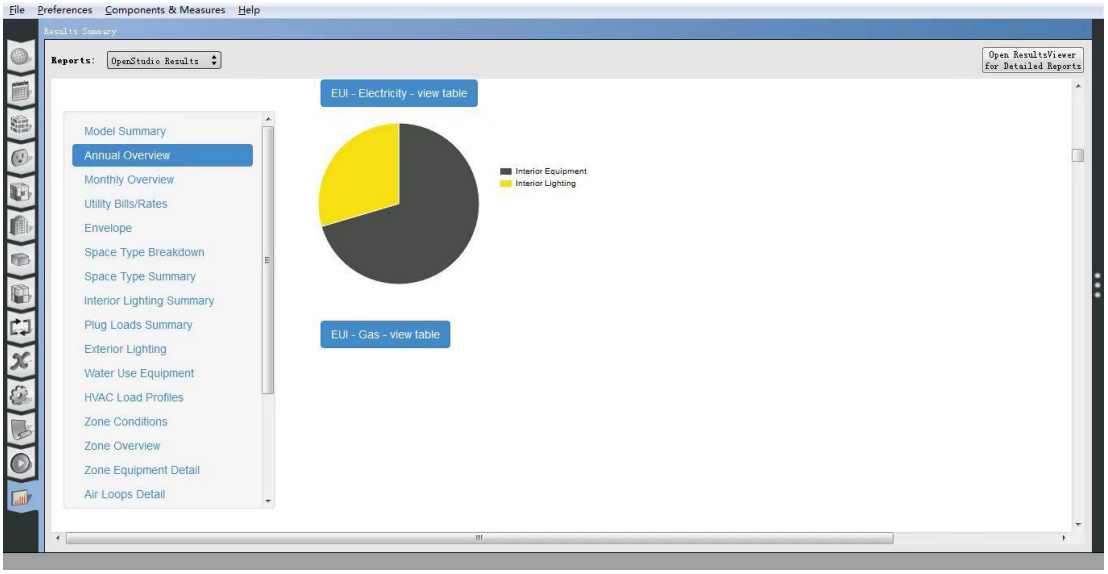


	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	3546.16	788.04	788.04
Net Site Energy	3546.16	788.04	788.04
Total Source Energy	10399.07	2310.90	2310.90
Net Source Energy	10399.07	2310.90	2310.90

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
Coal	1.050
Fuel Oil #1	1.050

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OpenStudio Results
Open ResultsViewer for Detailed Reports
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Annual Overview
Monthly Overview
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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
EUI - Electricity - view table
Interior Equipment
Interior Lighting
EUI - Gas - view table