Week 7

Wednesday, November 20, 2019
4:00 pm

Task 1:

Provide a summary of the main concepts that went through about solar radiation.

Solar radiation:

often called the solar resource, is a general term for the electromagnetic radiation emitted by the sun. Solar radiation can be captured and turned into useful forms of energy, such as heat and electricity, using a variety of technologies. However, the technical feasibility and economical operation of these technologies at a specific location depends on the available solar resource.

-Every location on Earth receives sunlight at least part of the year. The amount of solar radiation that reaches any one spot on the Earth's surface varies according to:

- Geographic location
- Time of day
- Season •
- Local landscape
- Local weather.

DIFFUSE AND DIRECT SOLAR RADIATION

As sunlight passes through the atmosphere, some of it is absorbed, scattered, and reflected by:

- Air molecules
- Water vapor
- Clouds
- Dust
- Pollutants
- Forest fires
- Volcanoes.

This is called ***diffuse solar radiation.*** ***direct beam solar radiation****:* The solar radiation that reaches the Earth's surface without being diffused.

The sum of the diffuse and direct solar radiation is **called *global solar radiation***. Atmospheric conditions can reduce direct beam radiation by 10% on clear, dry days and by 100% during thick, cloudy days.

MEASUREMENT:

Scientists measure the amount of sunlight falling on specific locations at different times of the year. They then estimate the amount of sunlight falling on regions at the same latitude with similar climates. Measurements of solar energy are typically expressed as total radiation on a horizontal surface, or as total radiation on a surface tracking the sun.

Radiation data for solar electric system(photovoltaic)are often represented as kilowatt-hours per square meter (kWh/m^2). Direct estimates of solar energy may also be expressed as watts per square meter (W/m^2).

Radiation data for solar water heating and space heating systems are usually represented in British thermal units per square foot (Btu/ft^2).

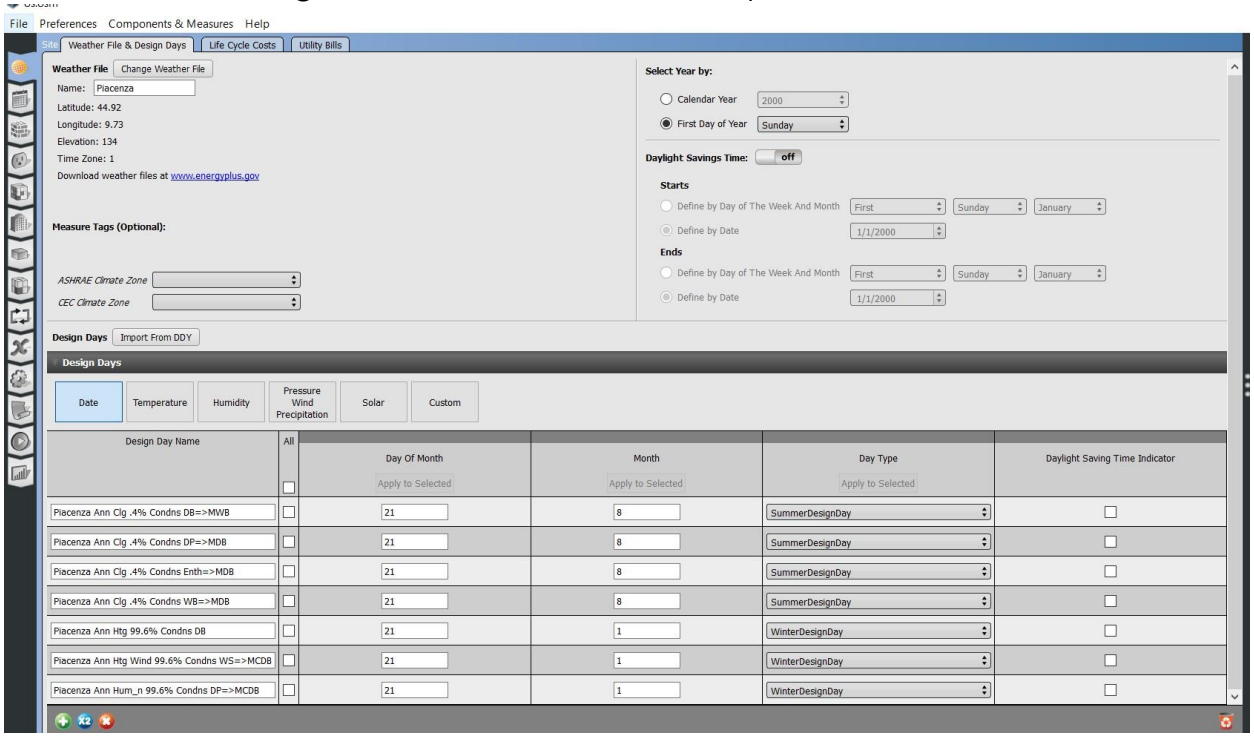
DISTRIBUTION:

The solar resource across the United States is ample for photovoltaic (PV) systems because they use both direct and scattered sunlight. Other technologies may be more limited. However, the amount of power generated by any solar technology at a particular site depends on how much of the sun's energy reaches it. Thus, solar technologies function most efficiently in the southwestern United States, which receives the greatest amount of solar energy.

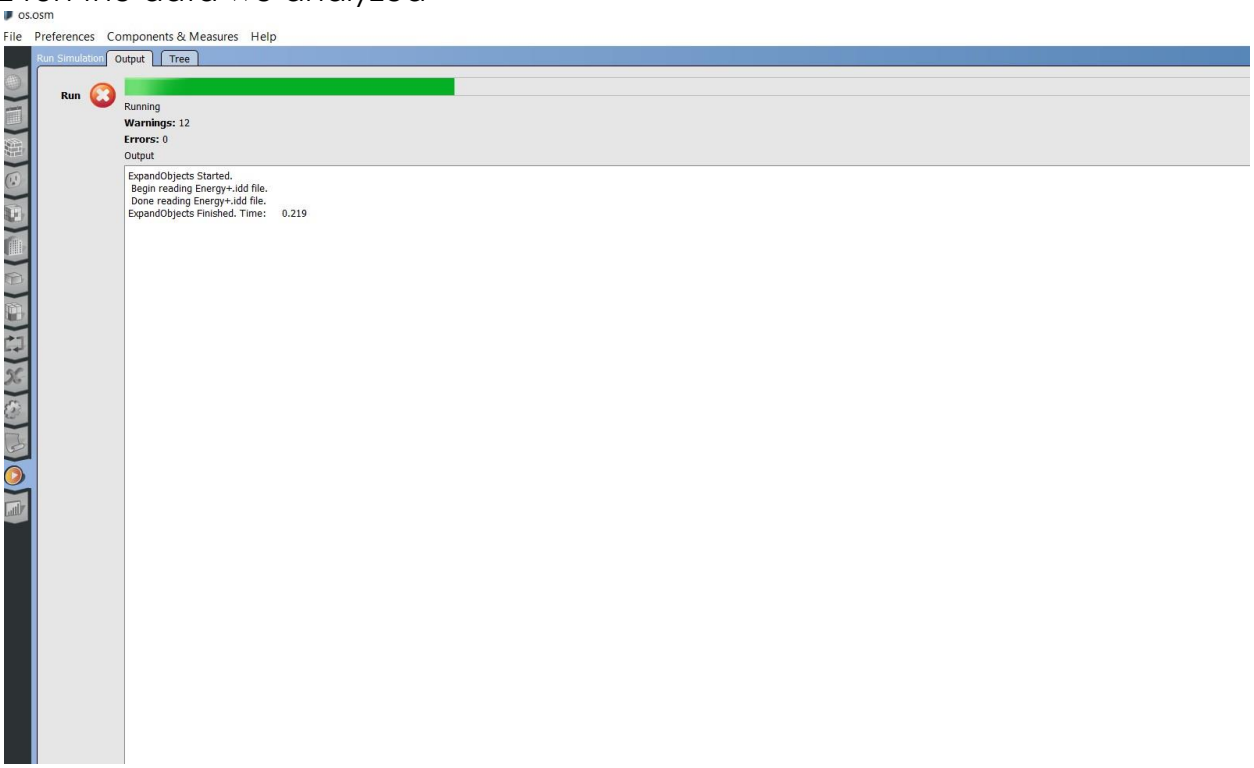
Task 2:

Create a pdf file with screenshots of all of the steps we went through in the second lesson on openStudio and explain briefly the reason behind the use of each step.

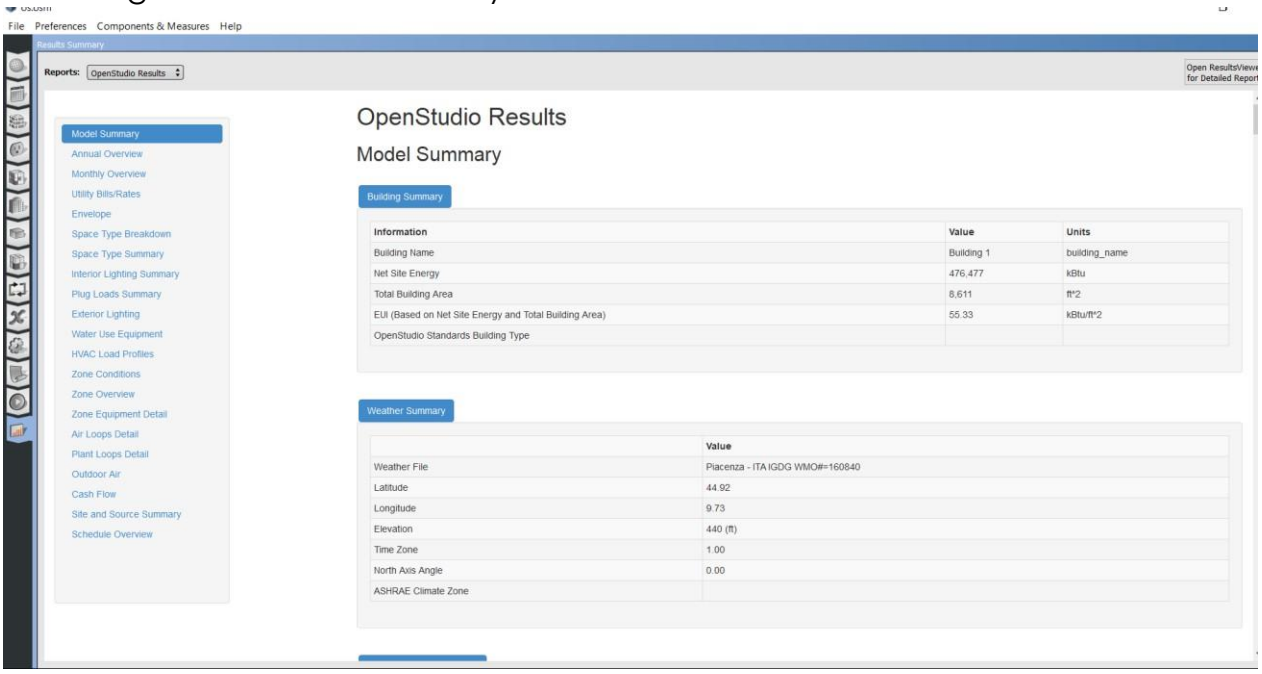
1-First of all is adding the data of the weather of piacenza



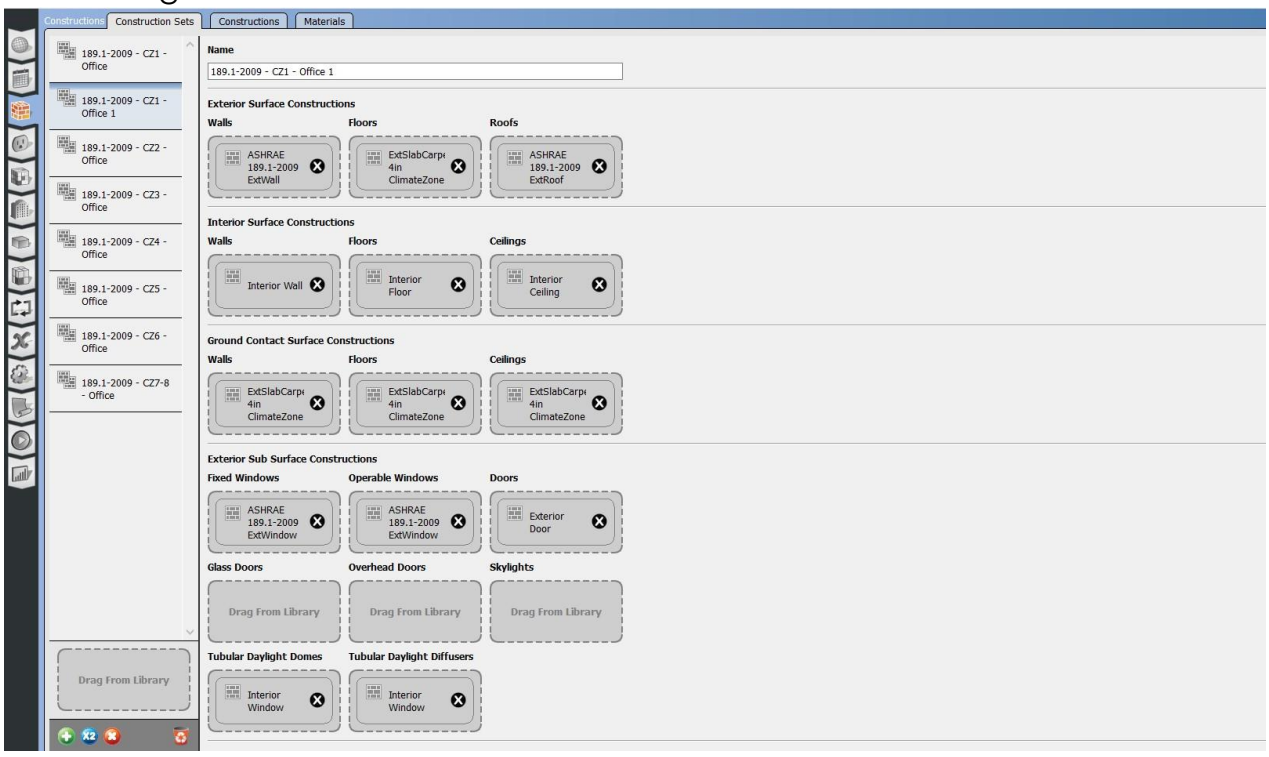
2-run the data we analyzed



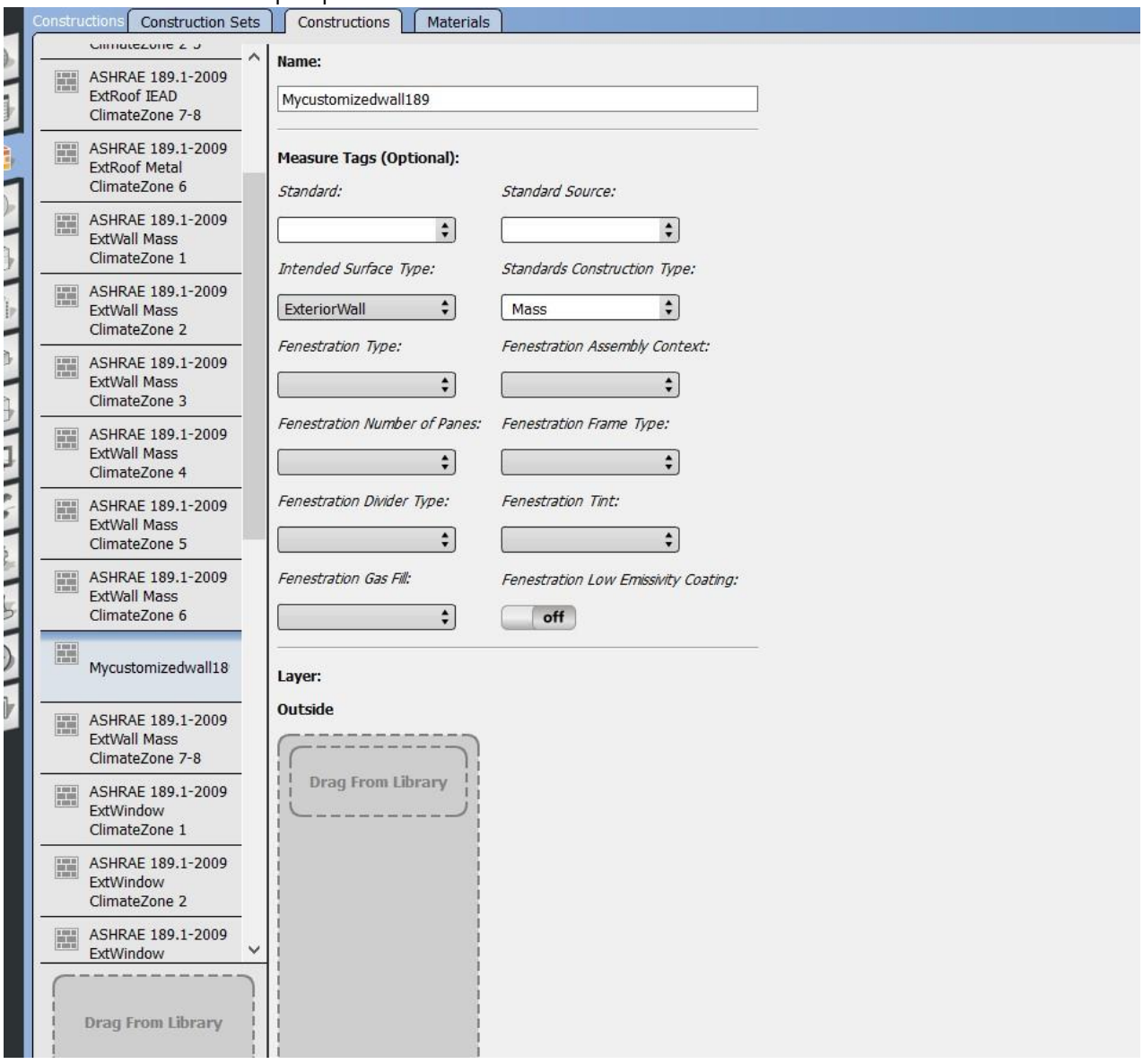
3-showing the results of the analysis



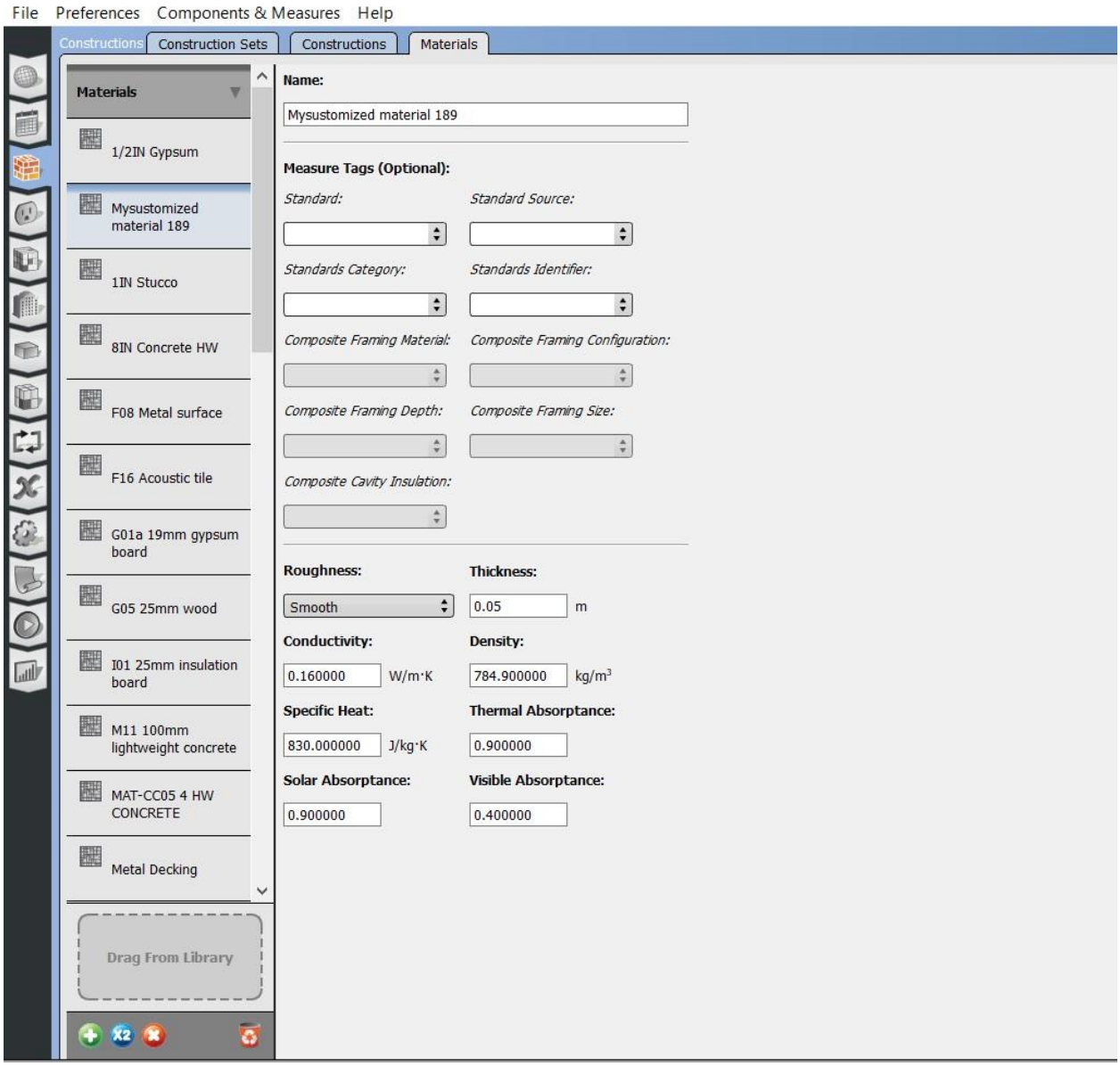
4-opening the construction sets to choose the customized walls and materials and then change the name



5-cutomize the wall properties



6-and also customize the materials by adding the wanted properties



7-we here can add the new materials that we chose for the customized wall we made