

# EnergyPlus Exercise Legacy OpenStudio 1

*Building Model in Legacy OpenStudio and HVAC Systems in IDF Editor*

*Last revised November 2012 for EnergyPlus v7.2.0.006*


## General Description

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This exercise provides a list of basic steps to create an EnergyPlus building model using the Legacy OpenStudio plugin in SketchUp.



## Key Reminders when Working in Legacy OpenStudio


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1. The most reliable way to save and open files is to use the Legacy OpenStudio plugin open/save/save as commands (plugin menu or toolbar). This will save and open EnergyPlus idf files. SketchUp will also prompt to save .skp files, but the link between the two files is not robust. The recommended approach at this time is to never save the .skp file, only the EnergyPlus .idf file.
2. As zones and surfaces are created, rename them using the Object Info Window . Renaming zones using the SketchUp group outline window may corrupt the EnergyPlus data.
3. The SketchUp group outline window provides a convenient way to locate and edit a zone. Double-click the zone in the list and the zone edit box should appear.
4. Do not use "undo", it may corrupt the EnergyPlus data. Delete unwanted surfaces using the delete or eraser tools.
5. Save intermediate versions of the idf file to provide a recovery point if the model gets corrupted.

## General Process for Creating an EnergyPlus Model in Legacy OpenStudio

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1. Plugins → Legacy OpenStudio → New 
2. New Zone , point and click to place in model, then double-click to open zone for editing
3. Draw footprint of first zone
  - a. Select a drawing tool such as the Line or Rectangle tool
  - b. Click and release to place starting point
  - c. Move mouse to establish direction (with no buttons pressed)
  - d. Click to place end point, or type dimensions and press <return>

4. Extrude footprint to create walls and roof/ceiling
  - a. Select Push/Pull tool
  - b. Click on floor surface and release button
  - c. Move mouse to establish direction (with no buttons pressed)
  - d. Click to establish height, or type dimension and press <return>
5. Assign names and constructions
  - a. Select SketchUp Selection tool
  - b. Show Object Info Window 
  - c. Enter zone name
  - d. Use selection tool to click on each surface and edit name, select construction, and set other attributes

*Note how the ZoneName will already reflect the new name entered in step 5c – this type of live link does not happen in IDF Editor.*
  - e. Use Orbit tool to rotate model to gain access to every surface of the zone
  - f. Add windows and doors, name them using Object Info Window 
6. Create additional zones by repeating above steps – be sure to assign meaningful names to the new zones and surfaces.
  - a. To access surfaces adjacent to another zone, show Outliner Window. This will list each zone by name (double-click name to edit zone, right-click name to hide/unhide zone).
  - b. Use Move/Copy tool to duplicate a zone – be sure to check outside boundary conditions in the copied zone. (all zones should be “closed” for editing before attempting to copy a zone)
7. Link interzone surfaces
  - a. Use the surface matching tool  to link boundary conditions for adjacent interzone surfaces.
8. Add Internal Loads and Simple HVAC
  - a. Use the Zone Loads tool  to add internal loads like people, lights, equipment.
  - b. Add HVACTemplate:Thermostat and HVACTemplate:Zone:IdealLoadsAirSystem to conditions the zones and compute zone heating and cooling loads
9. Add shading surfaces
  - a. Select New EnergyPlus Shading Group 
  - b. Click to place, then double-click to open for editing
  - c. Draw surfaces as desired
  - d. Use Object Info Window  to name them
10. Run simulations to evaluate envelope options and refine model.
11. Save idf file

12. Open idf file in IDF Editor to objects not supported by Legacy OpenStudio.
  - a. To add real HVAC systems, be sure to delete the HVACTemplate:Zone:IdealLoadsAirSystem objects first.
  - b. Then add other types of HVACTemplate zone, system and plant objects.
  - c. Add additional reporting.
13. Run simulations using EP-Launch or save idf and reopen in Legacy OpenStudio to run simulations.