# OpenStudio Version 0.4.0 Build 5730

*Release Notes – 06/17/2011*

This document contains information specific to the OpenStudio suite developed by the National Renewable Energy Laboratory – Electricity, Resources and Building Systems Integration Center (ERBSIC), Commercial Building Research group, Tools Development.  The document contains the following sections:

- Where To find OpenStudio Documentation
- Installation Notes
- New Features
- Known Issues

## Where to Find OpenStudio Documentation

OpenStudio release documentation, including these release notes, is available at
http://openstudio.nrel.gov/documentation

## Installation Notes

OpenStudio is supported on Windows, Mac, and Linux platforms.

### Installation Notes for Windows

Supported platforms are Windows XP/2000/Vista/7.

- Download EnergyPlus 6.0
- OpenStudio SketchUp Plug-in requires Google SketchUp 7.0 or later (Free or Pro versions).
- Download ruby.zip.  Unzip to C:\Ruby (or other desired location), add C:\Ruby\bin folder to Path, and create environment variable RUBYOPT (leave its value blank).
- Optionally download and install the 32-bit OpenSSL libraries if you will be running simulations on a system that requires it.
- Download the OpenStudio installer
- Run the installer.

### Installation Notes for Mac

Supported platforms are Mac OS X 10.5/10.6:

- Download EnergyPlus 6.0
- OpenStudio SketchUp Plug-in requires Google SketchUp 7.0 or later (Free or Pro versions).
- Ruby Bindings require Ruby 1.8.6 or 1.8.7, which comes installed on Mac OS X machines.  No need to install.
- Download the OpenStudio installer
- Run the installer.

## Installation Notes for Linux

- Supported platform is Ubuntu 10.04:
- Download EnergyPlus 6.0
- OpenStudio SketchUp Plug-in is not supported on Linux platform, as Google SketchUp is not available.
- Ruby Bindings require Ruby 1.8.6 or 1.8.7: **sudo apt-get install ruby-full**.
- Download the OpenStudio installer
- Run the installer.

## New Features

### OpenStudio Platform 0.4.0

New platform functionality was added to enable an additional OpenStudio application created for policy analysis.  New functionality includes:

- Added attributes and relationships to ModelObject to provide generic, name based interface for perturbations and codes and standards.
- Added components (partial models equipped with meta-data) to model to enable data sharing across models, projects, and users.
- Added base class ResourceObject to represent the shared data relationship that objects like schedules, constructions, and materials have with the objects that use them.
- New OpenStudio.idd data types
    - OS:ComponentData
    - OS:ComponentData:Attributes
    - OS:ComponentData:Tags
    - OS:CurrencyType
    - OS:ComponentCost:Adjustments
    - OS:ComponentCost:Reference
    - OS:ComponentCost:LineItem
    - OS:UtilityCost:Tariff
    - OS:UtilityCost:Qualify
    - OS:UtilityCost:Charge:Simple
    - OS:UtilityCost:Charge:Block
    - OS:UtilityCost:Ratchet
    - OS:UtilityCost:Variable
    - OS:LifeCycleCost:Parameters
    - OS:LifeCycleCost:RecurringCosts
    - OS:LifeCycleCost:NonrecurringCost
    - OS:LifeCycleCost:UseAdjustment
    - OS:ClimateZones
    - OS:TimeDependentValuation
    - OS:StandardsInformation:Building

- o OS:StandardsInformation:Construction
- Removed OpenStudio.idd data types
  - o OS:SimulationControl
  - o OS:StandardsTag:BuildingEnumValues
  - o OS:StandardsTag:ZoneEnumValues
- New Model derived type.
  - o Component
- New ModelObjects.
  - o AirGap
  - o AirWallMaterial
  - o Blind
  - o BuildingStandardsInformation
  - o CFactorUndergroundWallConstruction
  - o ClimateZones
  - o ComponentCost_Adjustments
  - o ComponentCost_LineItem
  - o ComponentCost_Reference
  - o ComponentData
  - o ComponentDataAttributes
  - o ComponentDataTags
  - o Construction
  - o ConstructionBaseStandardsInformation
  - o ConstructionWithInternalSource
  - o ConvergenceLimits
  - o CurrencyType
  - o DaylightSavingsTime
  - o DesignDay
  - o FFactorGroundFloorConstruction
  - o Gas
  - o GasMixture
  - o HeatBalanceAlgorithm
  - o InfraredTransparentMaterial
  - o InsideSurfaceConvectionAlgorithm
  - o LifeCycleCost_NonrecurringCost
  - o LifeCycleCost_Parameters
  - o LifeCycleCost_RecurringCosts
  - o LifeCycleCost_UseAdjustment
  - o LifeCycleCost_UsePriceEscalation
  - o Luminaire
  - o MasslessOpaqueMaterial
  - o OutsideSurfaceConvectionAlgorithm
  - o PhotometricDataIESFile

- o RefractionExtinctionGlazing
- o RoofVegetation
- o RunPeriod
- o Screen
- o Shade
- o ShadowCalculation
- o SimpleGlazing
- o SizingPeriod
- o SkyTemperature
- o SpecialDays
- o StandardGlazing
- o StandardOpaqueMaterial
- o ThermochromicGlazing
- o ThermostatSetpointDualSetpoint
- o TimeDependentValuation
- o Timestep
- o UtilityCost_Charge_Block
- o UtilityCost_Charge_Simple
- o UtilityCost_Computation
- o UtilityCost_Qualify
- o UtilityCost_Ratchet
- o UtilityCost_Tariff
- o UtilityCost_Variable
- o WeatherFileConditionType
- o WeatherFileDays
- o WindowDataFile
- o ZoneAirContaminantBalance
- o ZoneAirHeatBalanceAlgorithm
- o ZoneCapacitanceMultiplierResearchSpecial
- o ZoneControlThermostat
- Removed ModelObjects
  - o CmpntCostAdjustments (duplicate)
  - o LineItemCost (duplicate)
  - o Simulation (duplicate)
- Added ruleset sub-project to define rules for codes and standards as well as rule based ModelObject perturbation through attributes and relationships.
- Added rulesengine sub-project to harness third-party expert systems library for applying standards rulesets to building energy models.
- Synchronized the standards interface data dictionary with the California Energy Commission's draft controlled vocabulary for Title 24. Improved functionality of ProjectDatabase for performing mesh analyses and storing high level building attributes and simulation results for comparing multiple simulations.

## OpenStudio PerturbationAnalysisTool 0.4.0

- This is a new application released as part of the OpenStudio suite for simple perturbation analysis and visualization.
- The application perturbs a prescribed reference building model, and launches simulations using the OpenStudio RunManager. Results are stored in a local project database, which is accessed by OpenStudio post and rules processing methods. Simulation results may be presented in a variety of ways.
- It consists of a multi-paned user interface that allows a user to:
  - specify a climate zone,
  - specify a building type,
  - select building envelope options to be studied in a perturbation analysis,
  - select rules for compliance testing with some capability to visually edit rules,
  - and plot and compare simulation results.
- See online documentation for the PerturbationAnalysisTool for a complete list of the application's features and instructions for usage.

## OpenStudio SketchUp Plug-in 0.4.0

- Added 16 building type specific OSM templates. These are pre-populated with constructions, schedules, and zone loads from four different vintages.
- User Interface enhancements and user preferences added to support new templates.
- Added tool to surface matching dialog that automatically creates geometry required for surface matching. This can be automated across the entire model.
- Added tool to surface matching dialog to change boundary condition of selected surfaces to Adiabatic.
- User Interface enhancements to default constructions dialog, and added ability to copy construction sets.
- Modifications to Air Wall construction.
- User Interface enhancements to zone loads dialog, and added ability to copy construction sets.
- Added NonConvex and high vertex count test to surface Surface Searching dialog.
- Added Link to ModelMaker in place of Example File Generator.
- Output Request variables and BLDGHeating and BLDGCooling meters pre-loaded into templates.
- Simplified object naming.
- Mac speed enhancements in file importing/opening, surface matching, and surface searching.
- Better file extension handling on saving and exporting.

## OpenStudio RunManager 0.4.0

- Support for Radiance jobs.
- OpenSSL is no longer required to use RunManager unless you are distributing jobs to a system that requires it. This is also true for the SketchUp Plug-in, since it requires RunManager to launch properly.
- RunManager now starts in a paused state. It previously started in a run state.

- Better support for error handling of SSH error conditions when using SLURM clusters for job execution.
- Support for the XMLPreprocessor tool.
- Command line interface for executing jobs.
- Extensive user interface refinements and usability changes.
- Added ability to restore application defaults.
- Added options for choosing how job output paths are created.
- Added automated tool finder to aid the user with first time startup of RunManager.
- Provide more detail for executing jobs to allow the user to more closely inspect the job and its output.

## OpenStudio ResultsViewer 0.4.0
- Faster data import.
- Faster plotting.
- Minor user interface adjustments.

## OpenStudio SystemOutliner 0.4.0
- Support for multiple air loops and zones added.

## OpenStudio ModelEditor 0.4.0
- Minor user interface adjustments.

## OpenStudio Ruby Bindings 0.4.0
- Updated example files.

# Known Issues

The following are issues known at the time of the release.

## Known Issues Common to All Platforms

### OpenStudio SketchUp Plug-in
- The new OpenStudio Plug-in is much more stringent when opening files with unknown or flawed objects.  If your file does not open automatically, you should see the error and warnings dialog pop up.  You can manually open it from the OpenStudio toolbar.  A text editor may be used to alter or remove the objects listed before OpenStudio applications can open the file.
- Unclassified surfaces are created when a long operation is canceled.  When you draw in a zone and extrude your plan up, OpenStudio classifies all the newly created base surfaces.  Normally this is very quick, but may take longer if you have a complex shape or if you have the Object Information or Outliner window open.  If you interrupt the process by exiting the zone before it is done, the surfaces will not be classified.  If this happens, you should delete and redraw the incorrect surfaces.

- If you use copy multiple on group-level OpenStudio objects, you will get one extra copy. The extra group is created by the first copy-and-paste operation and is not removed when the copy multiple occurs. To address this after you do a copy multiple procedure on groups or zones, press delete. The objects you need to delete should already be selected. If you are copying loose surfaces such as windows, there are no problems, as SketchUp will merge equivalent surfaces.
- Making copies of multiple zones, or multiple copies of a single zone, may be very slow. You should save a file before initiating a large copy operation.
- The environment period drop-down menu is not updated correctly in the rendering settings dialog. When changing variables, updating normalization, etc., make sure to reselect the correct environment period in the drop-down menu.
- When running a simulation from an .osm file that contains weather information, the full path to the weather file may not appear properly in the weather file text field. This is a display issue only, and does not affect functionality.
- Loose comments are removed from files opened or imported into the SketchUp Plug-in. This does not affect comments following valid objects, just comments on their own line.

## OpenStudio ModelEditor and SystemOutliner
- If a field is set to "Auto-size," the units will not display. Once a valid number is input and the window redraws itself, the units will show up. Redraw can be triggered by changing the style of the floating point display (from unformatted to scientific or back) or by picking a new model object to inspect then return to the previous object.
- If floating point display is set to unformatted (the default), you cannot enter any non-digits except for ".". This means you cannot input a number in scientific notation. Switch to scientific format to allow the input of numbers in the style: 1.943e+5.

## OpenStudio ModelEditor
- No undo capability. Workaround: None.
- Add multiple selects in tree view. Workaround: None.
- Double-click should add class object to model. Workaround: Drag/drop.
- Right-click should add class object to model. Workaround: Drag/drop.
- Add "all" to object and class lists. Workaround: Use string search.
- Copy and paste does not grab data fields for some object types.
- Newly created objects are not always visible on screen.
- Cannot add top level objects while in tree view.

## OpenStudio SystemOutliner
- It is possible to drop some items in places they do not belong (for example, a fan on the demand side of the loop). This would create an incorrectly formatted .osm file that will cause EnergyPlus to fail. User input that would create invalid output will be handled in a future release. Workaround: None.

- Set-point Managers can be dropped onto the nodes of an Outdoor Air Mixer.  They will render on the Air Loop display, but they will show up in the right-hand edit window.  Workaround: None.
- Recent developer builds of SystemOutliner have a limited ability to import existing idf files.  Currently the zones and air loops will be imported and connected, but many components will be left behind.  The import routine does not work on systems that use plenums.  The IDF input function does not presently work on systems that use plenums.
- OSM files can be opened and IDF files can be imported, but you cannot currently save them back out.  The same is true of new files you make.  This functionality will be added back in the next major release.

## OpenStudio ResultsViewer
- Alias changes do not update in table view until the data are read in again.
- Data sets are expected to start on January 1 or later, and end on December 12 or earlier.  Run periods cannot wrap around the end or beginning of the year.
- Table view column rearrangements are not preserved.

## OpenStudio RunManager
- Not all SSH error conditions are properly handled during remote SLURM job execution.

## OpenStudio PerturbationAnalysisTool
- If the application is quit without running any simulations climate zone and building type will be reset when the file is re-opened
- When simulations are being run, detailed results cannot be viewed until the second simulation is done.
- No more than 16 perturbations can be run at one time.  This is by design, but may change in future releases.

## OpenStudio Platform, Including SWIG Bindings
- IdfObject::getQuantity and IdfObject::setQuantity functionality is not comprehensive.
- Workspace and Model functionality that follows pointers using the function WorkspaceObject::getSourceIndex may not work as expected if the given object points to the same target object multiple times.  For instance, Workspace::insert(const Workspace& ws) may not work as expected if ws contains a Construction object that uses the same material layer multiple times.
- Workspace and Model can introduce new name conflicts.  For instance, if ws in Workspace::insert(const Workspace& ws) contains an object that is not in the current Workspace, but has the same name, the object will be added and its name will not be changed.
- Using objects of type FluidProperties:Names or FluidProperties:GlycolConcentrations may result in a crash related to their first fields being both extensible and tagged as \reference.
- Text IDF objects whose type names are misspelled are imported under the type name Catchall, but the original misspelled name is not retained.

## Known Issues Specific to Microsoft Windows

### OpenStudio RunManager

- If you launch the RunManager application from the icon in the Start Menu, there may be problems when trying to run a simulation on an .osm file with the workflow: modeltoidf -> energyplus, this case occurs when trying to run this specific workflow on the included example .osm file.  Workaround: The simplest workaround is to launch the application from the <Install Location>\OpenStudio 0.4.0\bin folder.

## Known Issues Specific to Mac

### OpenStudio SketchUp Plug-in

- Toolbar tool-tips may not work correctly on a Mac if you have made your toolbars horizontal. The tool-tips never show on a Mac in the status bar.

## Known Issues Specific to Linux

### Qt libpng version

- Depending on what version of libpng.so is installed, there might be many warnings from programs compiled with Qt (SystemOutliner, ModelEditor, RunManager, ResultsViewer).  There is currently no fix for this problem.  Hopefully the next version of Qt will be compiled with a more up-to-date libpng.  This does not seem to affect the correctness of any OpenStudio software; it just causes a large number of warning messages on the terminal.