

OpenStudio Version 0.9.0 Build 10000

Release Notes – 9/28/2012

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
- Overview
- New Features
- Known Issues

Where to Find OpenStudio Documentation

OpenStudio release documentation, including these release notes, tutorials, and other user documentation is available at <http://openstudio.nrel.gov/documentation>. Documentation of the OpenStudio C++ and Ruby APIs is available at <http://openstudio.nrel.gov/sdk-documentation>.

Installation Notes

OpenStudio is supported on Windows, OS X, and Linux platforms.

Installation Notes for Windows

Supported platforms are Windows XP/Vista/7.

- Download and install [EnergyPlus 7.1](#).
- OpenStudio SketchUp Plug-in requires [SketchUp](#) 8.0 or later (Free or Pro versions).
- Optionally install the following.
 - Optionally download [ruby.zip](#) and install if you plan to use the scripts tab of the OpenStudio application or the integrated Radiance workflow. To install, unzip the download to C:\Ruby (or other desired location), and add C:\Ruby\bin to the PATH environment variable.
 - Optionally download and install the 32-bit [OpenSSL libraries](#) if you will be running simulations remotely through a SSH connection.
 - For Radiance integration see “Radiance_Installation_Instructions_0_9_0.pdf”
- Download the [OpenStudio installer](#).
- Run the installer.

Installation Notes for OS X

Supported platforms are Mac OS X 10.6/10.7:

- Download [EnergyPlus 7.1](#).
- OpenStudio SketchUp Plug-in requires [SketchUp](#) 8.0 or later (Free or Pro versions).
- Optionally install the following.
 - Ruby bindings require Ruby 1.8.6 or 1.8.7, which comes installed on Mac OS X machines. No need to install.
 - For Radiance integration see “Radiance_Installation_Instructions_0_9_0.pdf”
- Download the [OpenStudio installer](#).
- Run the installer.

Installation Notes for Linux

Supported platform is Ubuntu 12.04:

- Download [EnergyPlus 7.1](#).
- OpenStudio SketchUp Plug-in is not supported on Linux platform, as SketchUp is not available.
- Optionally install the following.
 - Ruby bindings require Ruby 1.8.6 or 1.8.7: **sudo apt-get install ruby-full**. You will need to install ruby if you want to use the scripts tab of the OpenStudio.
 - For Radiance integration see “Radiance_Installation_Instructions_0_9_0.pdf”
 - Optionally install the DAKOTA algorithm library as described on the [developer pages](#) if you plan to run large-scale analyses with the Ruby bindings.
- Download the [OpenStudio installer](#).
- Run the installer.

Overview

The OpenStudio version 0.9.0 release focuses on service hot water systems, construction and material editors, performance improvements, Radiance integration, and codebase development to support parametric analysis.

With the addition of service hot water modeling you can now simulate hot and cold water use throughout the building. Support for water-cooled chillers and cooling towers has also been added. The Building Component Library (BCL) integration in OpenStudio has been extended to include materials, in addition to constructions which it already supported. The constructions tab now has a drag and drop interface to add and remove material layers to a construction. Additionally the materials tab lets you inspect and change material properties. A Radiance checkbox has been added to the *Run* tab, and a supporting glare sensor added to the SketchUp plug-in. This checkbox allows you to integrate Radiance into your simulation without having to leave the application. You do need to install Radiance dependencies to enable this feature. API and codebase support has been added for more advanced parametric analysis and uncertainty quantification.

The focus in the SketchUp plugin has been performance and stability, and the inspector was also updated to be render-mode aware, allowing the user to select constructions, space types, thermal zones, and story objects by switching to the appropriate render mode and then selecting a space or

surface. Space naming for the diagram tool has been improved and a number of new sample user scripts added.

OpenStudio 0.9.0 supports EnergyPlus 7.1.

New Features

OpenStudio Platform 0.9.0

- Added support for Condenser systems, including water cooled chillers and cooling towers.
- Added support for service water systems including hot water served by a plant or hot water heater.
- Added cooling tower class, hot water heater class, and water use equipment class.
- New objects and methods were created to access EnergyPlus Construction objects, Material objects, and Window Material objects.
- A number of new objects are included in the OpenStudio Model API. For documentation on all objects and API methods please refer to the [developer section of the OpenStudio website](#).
- OSQuantityVector class provides for fast mathematical operations and unit conversion on vectors of values all sharing the same units.
- OpenStudio Model now ensures that all Schedules used by other objects have the appropriate ScheduleTypeLimits set. This enables the retrieval and setting of some schedule data (ScheduleRulesets in particular) in SI or IP units using the Quantity and OSQuantityVector classes (with unit conversion handled automatically). ScheduleTypeRegistry is provided to make it easier to find appropriate ScheduleTypeLimits given the intended use of the schedule (class name and schedule display name).
- Interfaces for a number of DAKOTA algorithms for multivariate sampling, sensitivity analysis, and uncertainty quantification have been added. In particular, FSU Dace, PSUADE, Parameter Study, and Sampling are now available. Uncertainty descriptions, which may be applied to both continuous and discrete variables, have also been added to support DAKOTA's Sampling methods.

OpenStudio SketchUp Plug-in 0.9.0

- General performance and stability improvements.
- Improved logic for maintaining matched “surface” boundary condition for pairs of surfaces.
- Improved naming to spaces made with the “Space Diagram” tool. Numbering logic now starts at Space 101, Space 102, etc. and then repeats on higher floors with Space 201 above Space 101
- A number of new sample user scripts have been added, including a script to merge/import spaces from an external model, and another to move selected geometry to a new space. This second script can be used to merge spaces by selecting multiple spaces, or to split a space into two, by selecting a subset of surfaces from within a single space.
- New Glare Sensor object in support of Radiance simulations.

- Simulations should be run from the OpenStudio application. The ability to directly run from the plugin has been removed. You can directly launch your model in the OpenStudio application by clicking the OpenStudio icon in the plugin toolbar.

OpenStudio Application 0.9.0

- The BCL Download dialog now includes the ability to download Material components, complementing the initial ability to download Construction components.
- The Constructions and Materials sub-tabs (located under the main tab “Constructions”) now offer *inspectors*, allowing the user visualize these objects, as well as make changes to existing construction and material objects, and construct entirely new ones. In total, 19 new EnergyPlus objects are now covered in these two new OpenStudio sub-tabs.
- Added new user interface features to support plant loop interactions, such as a water cooled chiller connected with a condenser system and cooling tower.
- Added new service water interface for both cold and hot water systems.
- Added support for water cooled chillers.
- Added cooling tower, hot water heater, water use connection, and water use equipment components.
- Added checkbox for “Using Radiance for Daylighting Calculations”. Checking this box will run a Radiance simulation from your model, and feed the daylighting results into EnergyPlus as a lighting schedule. Radiance daylighting data is also saved to a MySQL database for easier visualization in ResultsViewer. There are a number of additional dependencies to install to use this, see installation instructions for details.
- DaylightSim.rb now includes a daylight metrics report that writes an annual daylight metrics profile for each space, reporting Daylight Autonomy (DA), Continuous Daylight Autonomy (cDA), and Useful Daylight Illuminance (UDI) in a comma delimited file (.CSV). See the “Radiance_Installation_Instructions_0_9_0.pdf” document for details.
- Added “Space Infiltration Effective Leakage Area” to Spaces and Space Types.
- General performance and stability improvements, including faster tab switching and sorted object lists.
- SpaceInfiltrationEffectiveLeakageArea

OpenStudio RunManager 0.9.0

- Improved support for OpenStudio-created OSM files. Various bug fixes.

OpenStudio ResultsViewer 0.9.0

- We now generate Radiance SQL files that ResultsViewer can open.

OpenStudio PolicyAnalysisTool 0.9.0

- No changes since version 0.8.0.

OpenStudio Ruby Bindings 0.9.0

- Resolved problems with loading of incorrect Qt libraries on Windows.

- New objects and methods are available in the Ruby bindings. Please refer to the developer documentation for details.

OpenStudio C# Bindings 0.9.0

- New objects and methods are available in the C# bindings. Please refer to the developer documentation for details.

Known Issues

The following are issues known at the time of publication of these release notes. Please contact openstudio@nrel.gov if you require further assistance.

Known Issues Common to All Platforms

OpenStudio SketchUp Plug-in

- 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 perform a copy multiple procedure on groups or spaces, 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. [bug 36]
- Using SketchUp's undo operation on OpenStudio model elements may produce unexpected results. [bug 438 & 797]
- If you have a SQL file open in ResultsViewer from an earlier simulation, re-running that simulation without closing the SQL file will result in a simulation failure. You will have to close and unlock the SQL file to resolve this. Please contact openstudio@nrel.gov for assistance. [bug 271]
- SKP and OSM link is not maintained when files are relocated. You can manually re-establish that link. [bug 61]
- It is possible for the OpenStudio Plug-in to conflict with other SketchUp plug-ins. If you suspect this is a problem, try testing with other plug-ins disabled, or contact openstudio@nrel.gov for assistance. [bug 25]
- When in render by data mode with a SQL file loaded, the model will be slow to respond when you change the time of day or time of year. [bug 381]
- If third-party applications using Qt binaries are in the system's environment path before OpenStudio, the OpenStudio SketchUp plug-in will attempt to load incompatible Qt libraries. This can be resolved by reordering the environment path or by copying OpenStudio's Qt dlls to your SketchUp directory. [bug 307]
- Some models may not intersect or match correctly. Email openstudio@nrel.gov for assistance if this happens. [bug 856 and 768]
- Importing some IDF files may crash OpenStudio and the SketchUp Plug-in [bug 866]

- Import Constructions and Import Schedules from the OpenStudio SketchUp Plug-in are broken, but you can load an OSM file as a library in the OpenStudio application and then drag specific objects into your model. [930]

OpenStudio Application

- Several tabs in the workflow are marked as “coming soon” and will be completed in upcoming releases of OpenStudio. In some cases (e.g. utility rates), alternate workflows are described within the application.
- SystemOutliner’s Ruby console functionality has not been included in this release of the OpenStudio Application, but is planned for a future release.
- Using the mouse scroll wheels while hovering over graphics in the results summary tab will inadvertently zoom them in and out. [bug 574]
- To enable setpoint schedule drop zones on Thermal Zones tab you need to first turn on the thermostat.
- After adding constructions from the BCL window you need to change tabs on the left of the interface to refresh the library objects. [bug 773]
- When re-loading a model with scripts, you need to switch away from and back to a script to load arguments [bug 770]
- Similar thermostats assigned in the SketchUp plugin are shared across thermal zones in the OpenStudio application. Changing or turning off one will do the same to others. [bug 722]
- Changes to start and end dates of Daylight Savings don’t stick [bug 695]
- Importing some IDF files may crash OpenStudio and the SketchUp Plug-in [bug 866]
- The view doesn’t always refresh correctly when you delete a material from a construction. If you still see a material after clicking the “x” switch away from and back to the object to refresh the view. [bug 925]

OpenStudio ResultsViewer

- Alias changes do not update in table view until the data are read in again. [bug 7]
- 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. [bug 78]
- Table view column rearrangements are not preserved. [bug 34]

OpenStudio RunManager

- EnergyPlus ForwardTranslator errors do not appear in the RunManager GUI elements (Bug 897)

OpenStudio Platform, Including SWIG Bindings

- `IdfObject::getQuantity` and `IdfObject::setQuantity` functionality is almost, but not completely comprehensive. The getters and setters for fields whose units are “BasedOnField AX” are not expected to work at the `IdfObject` level, but are to be handled only for OS: prefixed objects by the specific interfaces of classes derived from `ModelObject`.
- The default naming scheme of `WorkspaceObject` (base class for `ModelObject`, etc.) sometimes results in undesired name clashes when transferring objects between models, including in the EnergyPlus translators. Therefore, some objects may be unexpectedly renamed or copied.

- EnergyPlusPreProcessJob issues an Error for not being able to remove a file, causing the Job to "fail" (Bug 934)

Known Issues Specific to Mac

- At this time, we are unable to provide simple installation instructions for DAKOTA on OS X. We plan to work with the DAKOTA team to be able to provide this in future releases. [bug 437]

OpenStudio SketchUp Plug-in

- Toolbar tooltips may not work correctly on a Mac if you have made your toolbars horizontal. The tooltips never show on a Mac in the status bar. The button state may also be incorrect. This is a bug in SketchUp vs. the plug-in. [bug 375]
- The Color scale in the Render Settings dialog appears in grayscale vs. color. Render by data is slow to update when time or date is changed. [bug 379]
- Closing a model and then opening another or starting a new one may crash SketchUp. This can be avoided by restarting SketchUp before opening a new model. [bug 674]