

OpenStudio Version 0.7.0 Build 8443

Release Notes – 03/23/2012

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, Mac, and Linux platforms.

Installation Notes for Windows

Supported platforms are Windows XP/Vista/7.

- Download [EnergyPlus 7.0](#)
- OpenStudio SketchUp Plug-in requires [Google SketchUp](#) 8.0 or later (Free or Pro versions).
- Optionally download [ruby.zip](#) and install if you plan to use the scripts tab of the OpenStudio Application or user scripting within the SketchUp Plug-in. To install, unzip the download to C:\Ruby (or other desired location), add C:\Ruby\bin to the PATH environment variable, and create the environment variable RUBYOPT (leave its value blank).
- Optionally download and install the 32-bit [OpenSSL libraries](#) if you will be running simulations remotely through a SSH connection.
- Optionally download and extract Radiance binaries from the “[Getting Started with Radiance Page](#)” if you plan to use the new Radiance integration features.
- Download the [OpenStudio installer](#)
- Run the installer.

Installation Notes for Mac

Supported platforms are Mac OS X 10.6/10.7:

- Download [EnergyPlus 7.0](#)
- OpenStudio SketchUp Plug-in requires [Google SketchUp](#) 8.0 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.
- Optionally download and extract Radiance binaries from the “[Getting Started with Radiance Page](#)” if you plan to use the new Radiance integration features.
- Download the [OpenStudio installer](#)
- Run the installer.

Installation Notes for Linux

Supported platform is Ubuntu 10.04:

- Download [EnergyPlus 7.0](#)
- 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**. You will need to install ruby if you want to use the scripts tab of the OpenStudio Application or user scripting in the SketchUp Plug-in.
- Optionally download and extract Radiance binaries from the “[Getting Started with Radiance Page](#)” if you plan to use the new Radiance integration features.
- 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 0.7.0 release focuses on extensions to the SDK to enable a comprehensive, workflow-centric application that complements the SketchUp Plug-in. The application integrates SystemOutliner’s functionality from release 0.6.0 and expands on its “drag and drop” paradigm for model resources. This capability will be integrated with the Building Component Library (<http://bcl.nrel.gov>) in the next major release (0.8.0) of OpenStudio. Other noteworthy features of the new application include visual editing of schedules; extensibility via the integration of user scripts into three points of the simulation workflow: at the beginning using the OpenStudio Model, after translation to EnergyPlus IDF format, and post-simulation; a simulation results summary; and support for IP units.

NOTE: As with OpenStudio 0.6.X, some EnergyPlus data has yet to be translated to the OpenStudio Model, and is therefore lost on import from EnergyPlus IDF files. In addition, this release is not backwards compatible with data files from previous OpenStudio releases, and no tools have been provided to upgrade data files from version 0.6.X and earlier.

New Features

OpenStudio Platform 0.7.0

- Support for IP and SI unit conversion is now provided by the OpenStudio API. The improved interface can be used alone to do basic engineering calculations, and can be accessed in context using Idf, Workspace, and ModelObjects. Related methods enable retrieval of values as quantities (value + units), rather than as bare double values. This capability is exposed through the new OpenStudio application.
- New objects and methods were created to support the construction of the OpenStudio Application
- The concept of a component library was explicitly exposed by the OpenStudio Application, as a precursor to integration with the Building Component Library.
- A formal structure for user scripts in the context of a modeling and analysis workflow has been created and exposed through the new OpenStudio Application. This extends the SketchUp Plug-in user script concept to the new application and to the large-scale analysis framework (currently only available through the C++ and Ruby APIs).
- A significant 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](#).
- Enabled DAKOTA Distributed Design and Analysis of Computer Experiments (DDACE) sampling algorithms with discrete variables in addition to continuous ones within the OpenStudio analysis framework.
- Added "three-phase" daylighting analysis capability to allow for facade-independent dynamic window simulations with Radiance and the daylight coefficient method. Three-phase presently supports only illuminance maps, not images. Support for image generation and a stochastic blind operation model is planned.
- HVAC Templates have been significantly upgraded to improve the resulting EnergyPlus models.

OpenStudio SketchUp Plug-in 0.7.0

- IP units are now used in the SketchUp Plug-in. A simple mechanism for changing between IP and SI will be included in an upcoming developer release.
- A button to launch the new OpenStudio Application with your current model has been added to the toolbar.
- General performance and stability improvements.

OpenStudio Application 0.7.0

- A new application has been added to the OpenStudio tool suite. The application combines functionality from the Plug-in inspector and SystemOutliner to present users with a comprehensive and logical workflow for building energy modeling.
- The application is organized into a number of tabs that include:
 - Resource Management Tabs – Define resources used by a building energy model

- Site – Used to specify weather files, design days. In the future it will also allow you to specify utility rates and ground and water temperatures.
- Schedules – Used to visually edit schedules and create schedule sets that are referenced by loads.
- Constructions – Used to specific construction resources that are referenced by spaces.
- Loads – Used to specific end use resources that are referenced by spaces.
- Spaces Types – Used to specify the collections of constructions, end uses, schedules, etc. that are associated with specific regions within a building.
- Stories – Used to modify constructions, end uses, schedules, etc. that are associated with collections of spaces or zones.
- Model Specification Tabs – Used to define the building.
 - Building – Used to manage space assignments within a building
 - Thermal Zones – Used to manage zone assignments for spaces along with thermostats and ideal loads
 - HVAC System – Used to visually edit air and plant loops and assign zones to loops
 - Building Summary – Not presently implemented, but will provide a summary of model input data
- Simulation Management – Used to define simulation parameters, manage execution, and visualize outputs.
 - Output Variables – Used to specify variables to be logged in the EnergyPlus SQL database.
 - Simulation Settings – Not presently implemented, but will provide access to simulation control variables.
 - Scripts – Used to specify Ruby scripts and arguments that may operate on the OpenStudio model, the translated IDF file, or simulation results.
 - Run Simulation – Used to run and monitor simulation progress.
 - Results Summary – A high level summary of building end uses following a simulation.
- Significant new functionality includes a graphical schedule editor, the ability to extend the application’s inherent capability through user scripting at various points in the simulation workflow, and a high level simulation results summary.
- This application expands on the “drag and drop” model resource mechanic introduced in SystemOutliner. Seamless integration of these resources with the Building Component Library (<http://bcl.nrel.gov>) is the primary focus of the next major release (0.8.0) of OpenStudio.

OpenStudio RunManager 0.7.0

- No changes since Version 0.6.0.

OpenStudio ResultsViewer 0.7.0

- ResultsViewer is easily launched from the OpenStudio Application at an appropriate location in the workflow

- No changes since Version 0.6.0.

OpenStudio SystemOutliner 0.7.0

- The functionality of SystemOutliner has been incorporated into the new OpenStudio Application. As a result, the standalone SystemOutliner application is no longer part of the OpenStudio installation.

OpenStudio PolicyAnalysisTool 0.7.0

- The PolicyAnalysisTool is included in the 0.7.0 release, but with limited functionality. It currently includes the small office building type. The full functionality will be restored in future releases.
- Minor user interface improvements.

OpenStudio Ruby Bindings 0.7.0

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

OpenStudio C# Bindings 0.7.0

- 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

- OpenStudio 0.7.0 may not open models made with previous versions of OpenStudio.
- The OpenStudio Plug-in has been equipped with additional validations and checks on files containing unknown or flawed objects. If your file does not open correctly, please examine the errors and warnings dialog popup.
- Unclassified surfaces may be created when a long operation is canceled. When you draw in a space and extrude your plan up, OpenStudio classifies all the newly created base surfaces. Normally this is a fast operation, but occasionally it may take longer if you have a complex shape or if you have SketchUp's Outliner window open. If you interrupt the process by exiting the space before it is complete, the surfaces will not be classified. If this happens, you should delete and redraw the incorrect surfaces. [bug 252]
- 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]

- Making copies of multiple spaces, or multiple copies of a single space, may be very slow. You should save your file before initiating a large copy operation. [bug 252]
- Models with a large number of spaces and surfaces may have poor performance. We are aware of this and plan to address it in future releases. [bug 252]
- Using SketchUp's undo operation on OpenStudio model elements may produce unexpected results. [bug 438]
- If you have been using OpenStudio with SketchUp 7.0 it is recommended that you upgrade to SketchUp 8. Closing the Inspector window in SketchUp 7 may result in a crash. [bug 299]
- 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]
- Surfaces do not always classify correctly. When this happens, you can manually re-classify the surface, or delete and redraw an edge to force OpenStudio to create a new surface. [bug 140]
- 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]
- Support for holidays has been removed from OpenStudio 0.7.0. It will be added back in a future version.

OpenStudio Application

- The initial release of the OpenStudio Application exposes only IP units. Selectable (IP or SI) units will be available shortly in a developer release.
- 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 the initial release of the OpenStudio Application, but is planned for a future release.
- If you repeatedly and quickly click the delete loop button in the HVAC tab, the application may crash. This behavior may exist with some other objects as well. [bug 416]
- Support for holidays has been removed from OpenStudio 0.7.0. It will be added back in a future version.

- 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.
- HVAC systems generated using HVAC Templates on the loops tab for some system types (PSZ-HP, Packaged VAV with Reheat, VAV with Reheat) may have significant “setpoint not met during occupied hours” in the EnergyPlus results.

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

- No known bugs.

OpenStudio Platform, Including SWIG Bindings

- `IdfObject::getQuantity` and `IdfObject::setQuantity` functionality is not comprehensive, although it is much more comprehensive in this release than it was in previous releases. The quantity 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.
- The BCL functionality is currently unavailable due to recent API updates. However, components can still be downloaded and incorporated from the web interface. This functionality will be restored in an upcoming developer release.

Known Issues Specific to Mac

- At this time, we are unable to provide simple install instructions for DAKOTA on Mac OS. 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]