OpenStudio Version 1.0.0 Build 12393

Release Notes – 06/28/2013

These release notes describe a particular version of the OpenStudio software suite developed by the National Renewable Energy Laboratory (NREL), Electricity, Resources, and Building Systems Integration Center (ERBSIC), Commercial Buildings Research Group, Tools Development Section, and associated collaborators. The notes are organized into 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.
- C++ API documentation is available at http://openstudio.nrel.gov/sdk-documentation.
- Measure writing documentation is available at http://openstudio.nrel.gov/openstudio-measure-writing-guide
- OpenStudio Life Cycle Costing Examples document is available at http://openstudio.nrel.gov/openstudio-life-cycle-examples

Installation Notes

OpenStudio is supported on Windows XP – 7, OS X 10.7 – 10.8, and Ubuntu 12.04.

Installation Steps

- Download and install EnergyPlus 7.2. The main EnergyPlus page takes you to EnergyPlus 8. Follow the steps below to download EnergyPlus 7.2
    - Create an EnergyPlus account if you don't have one and then login.
    - After you log in you can click the link to access the page to "Download Older Versions of Energy Plus".
    - Choose the appropriate version of EnergyPlus 7.2 for your computer. Download and follow the instructions. OpenStudio will work with 32 or 64bit EnergyPlus installers.
- The OpenStudio SketchUp Plug-in requires Sketchup 8.0 or SketchUp 2013 (not available for Linux).
- Create an OpenStudio account, then download and install OpenStudio.
- Setup a Building Component Library (BCL) account to access online building components and measures. View instructions on how to setup your account and configure the key in OpenStudio.

Optional Installation Steps

- For Radiance integration, download and install [Radiance](#).
- If you plan to use the OpenStudio SDK Ruby bindings via command prompt on Windows, download and extract [ruby.zip](#) to C:\Ruby (or other desired location), and add C:\Ruby\bin to the PATH environment variable.
- Install the DAKOTA algorithm library as described on the [developer pages](#) if you plan to run large-scale analyses with the Ruby bindings.
- Download and install the [32-bit OpenSSL libraries](#) if you will be running simulations remotely through an SSH connection on Windows.

Overview

OpenStudio 1.0.0 adds life cycle cost objects to OpenStudio models and to energy conservation measures used in the Parametric Analysis Tool (PAT). In addition to being able to evaluate design alternatives based on energy use, users can now look at total life cycle costs, first year capital costs, annual utility savings, and simple payback. A new HVAC control view lets users set the operation time, night cycle operation, supply air temperature, economizer, and demand controlled ventilation for air loops. A major new category of HVAC equipment has been added with the introduction of an air to air heat recovery model, which can be used to model a variety of sensible and latent heat recovery devices.

New Features

OpenStudio Platform 1.0.0

- Added new model object LifeCycleCost for capturing capital and operating costs associated with building components and measures.
- Improved EnergyPlus IDF import and export. EnergyPlus export is now more repeatable and import is more stable.
- Improved consistency in the handling of multipliers throughout the OpenStudio model API.
- Suppressed erroneous log messages.
- All applications now catch thrown exceptions and report the error to the user before exiting or relaunching.
- BCL measures can now be updated to the latest version through the BCL dialog.
- Added and improved filesystem integration on Windows, Linux, and OS X, including imporoved installers.

OpenStudio SketchUp Plug-in 1.0.0

- Improved general performance and stability.
- Added OpenStudio SketchUp plug-in support for SketchUp 2013 (Pro and Make).
- Simplified plug-in user interface.
- gbXML import now handles files with malformed surfaces.

- Added "Export RPX File" for integration with the ASHRAE Radiant Performance Explorer human comfort tool. This can be found under "OpenStudio User Scripts / Reports".
- Improved default profiles on Ruleset Schedules.

OpenStudio Application 1.0.0

- Improved general performance, stability, and usability.
- Added a new "Controls" subtab for air loops in the "HVAC Systems" tab. This allows the user to set the HVAC operation schedules, night cycle, supply air temperature, economizer, and demand controlled ventilation.
- A major new category of HVAC equipment has been added with the introduction of an air to air heat recovery model, which can be used to model a variety of sensible and latent heat recovery devices.
- New HVAC Components
  - Water-to-air heat pumps
  - Water and electric baseboard heaters
  - Demand controlled ventilation
  - Night cycling
  - Air-to-air energy recovery
  - Constant volume pumps
  - Outdoor air based reset control strategy for air and water loops
  - Unit heaters
- Replaced "Scripts" tab with "Measures" Tab that is consistent with the Parametric Analysis Tool.
  - Measures added to a model in this tab will be brought into the Parametric Analysis Tool if the model is chosen as a baseline.

OpenStudio ParametricAnalysisTool 1.0.0

- Measures are now downloaded from the Building Component Library instead of being included in the installer. Users can download new measures as they are posted, and get updates to existing measures without having to install an update to OpenStudio.
  - If a new measure makes use of features added in a later version of OpenStudio then you will have to update OpenStudio if you want to use that particular measure.
- Updated measures now include inputs to support new life cycle analysis object in OpenStudio. Measures can add life cycle objects or manipulate objects that already exist. The following are some common inputs introduced, although specific inputs will vary from measure to measure.
  - Material and Installation Cost
  - Years Until Costs Start (number of years left until due to be replaced)
  - Demolition Cost Occur During Initial Construction (true/false)
  - Expected Life
  - O&M Costs
  - O&M Frequency
- Added "Always Run Measures" that operate on the baseline model as well as each design alternative.

- These measures can run at various stages defined by where the user places them relative to the measure groups in the project.
- Some measures added to the Building Component Library that were designed to be used as "Always Run Measures" are under "Economics -> Life Cycle Cost Analysis". Many of these add life cycle costs to objects in the model.
- Added new columns to the "Reports" tab to show First Year Capital Cost, Annual Utility Cost, Simple Payback, and Total Life Cycle Cost.

OpenStudio RunManager 1.0.0
- No changes.

OpenStudio ResultsViewer 1.0.0
- No changes.

OpenStudio Ruby Bindings 1.0.0
- No changes.

OpenStudio C# Bindings 1.0.0
- No changes.

OpenStudio Python Bindings 1.0.0
- Added experimental bindings.

OpenStudio JavaScript V8 Bindings 1.0.0
- Added experimental bindings.

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. [bugs 438 and 797]

- SKP and OSM link is not maintained when files are relocated. You can manually re-establish that link. When opening a SketchUp file Launch SketchUp and then Open the SketchUp file. If that doesn't work you can also directly load the OSM file, bypassing the SKP file. [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 24]
- Importing Constructions and Import Schedules from the OpenStudio SketchUp Plug-in are broken, but you can load an OSM file as library in the OpenStudio application and then selectively drag specific objects into your model. [bug 930]
- Using "Intersect" in the surface matching dialog can result in a crash or unexpected result. This is more common with models that were imported from other CAD formats at some point in the workflow. It is a good idea to save prior to using this to avoid any loss of data. This is related to an underlying SketchUp bug. [bugs 856 and 1220]
- "Project Loose Geometry" can crash SketchUp. It is a good idea to save prior to using this to avoid any loss of data. [bug 1221]
- If your OpenStudio model crashes SketchUp or has unexpected behavior please forward it to OpenStudio@NREL.gov with a description of the problem. Please also include the directory that has the same name as the OSM file. You can attach it as a zip file. [bug 1231]

OpenStudio Application

- The Site / Utility Rates subtab the workflow are marked as "coming soon," and will be completed in an upcoming release of OpenStudio.
- To enable set point schedule drop zones on the Thermal Zones tab, you need to first turn on the thermostat.
- Using the mouse scroll wheel while hovering over graphics in the Results Summary tab will unintentially zoom them in and out. [bug 574]
- Similar thermostats assigned in the SketchUp Plug-in are shared across thermal zones in the OpenStudio application. Changing or turning off one will do the same to others. [bug 722]
- The view does not 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]
- Not all of the schedules required to make a valid People object can be assigned in the application. [bug 664]
- The 3-phase daylighting simulation method is currently inoperable due to a fundamental change in the way the lighting calculation points are passed to Radiance, and will be updated in an upcoming release of OpenStudio. [bug 943]

OpenStudio ParametricAnalysisTool

- PAT won't prevent you from loading OSM files that are from a newer version of OpenStudio than you have installed, but the analysis won't run. [bug 1240]
- Daylighting control object variables can't be requested in the output variables tab. [bug 1290]
- The results tab may not be legible on a 1024x768 screen. [bug 1295]

- Adding a design alternative using measure groups will remove any design alternatives made from external files. You can however add a design alternative made from external files without losing design alternatives made from measure groups. [bug 1236]
- Always Run measures are applied to externally constructed design alternatives. This may result in unexpected results or errors.
- Measures specified within externally constructed design alternative models are not applied.

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 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.
- OpenStudio::Model::ComponentVector objects may be inaccessible from the Ruby bindings. [bug 1005]

Known Issues Specific to OS X
- To Install OpenStudio 1.0 correctly on OS X you need to first uninstall earlier versions of OpenStudio. [bug 1303]
- At this time, we are unable to provide simple installation instructions for DAKOTA on OS X. We are working with the DAKOTA team to be able to provide this sometime in 2013. [bug 437]
- The SketchUp Plug-in toolbar tooltips do not work correctly on OS X if you have made your toolbars horizontal. The tooltips never show on OS X in the status bar. The button state may also be incorrect. This is a bug in SketchUp versus the plug-in. [bug 375]

Bug Analytics Since Previous Release
- 89 new bugs were filed since April 1st 2013.
- 51 bugs were closed since April 1st 2013.