OpenStudio Version 1.1.0

Release Notes – 10/18/2013

These release notes describe version 1.1.0 of the OpenStudio software suite developed by the National Renewable Energy Laboratory (NREL), Buildings and Thermal Systems, 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 are available at http://openstudio.nrel.gov/openstudio-life-cycle-examples

Installation Notes

OpenStudio is supported on Windows XP – 8.1, OS X 10.7 – 10.8, and Ubuntu 12.04.

Installation Steps

- Download and install EnergyPlus 8.0.
  - Download EnergyPlus 8.0. Create an account and login if you don't already have one.
  - 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.

Overview

OpenStudio 1.1.0 adds support for manual calibration of simulation results from monthly utility data. A new reporting measure type was introduced that has access to input data and simulation results that can be used to create custom reports and to perform automated quality control checks. Another major new feature is simulation using cloud computing resources through Amazon EC2. Users first set up an account with Amazon and link it to OpenStudio. The ParametricAnalysisTool (PAT) can then be used to run simulations locally or on Amazon EC2. This feature is still under active development to improve process connection and performance, and <u>users are strongly urged to carefully review all disclaimer text and provided EC2 monitor web links in the cloud configuration dialogs</u>. This version of OpenStudio also adds support for EnergyPlus 8.0 along with a number of new HVAC components.

New Features

OpenStudio Platform 1.1.0
- Added support for EnergyPlus 8.0.
- Added a new calibration feature that compares monthly utility data to simulation results. Users should use an actual meteorological year (AMY) weather file for best results.
- Added support for reporting measures that can process model inputs and simulation outputs as part of a workflow.
- Added back-end support for parallel simulation using Vagrant and Amazon EC2 instances. This feature is still under active development to improve performance and stability of distributed computing resources. Simulations in PAT may still be run locally as well.

OpenStudio SketchUp Plug-in 1.1.0
- Improved general performance, stability, and usability.
- Added shading controls for sub-surfaces.
- Added experimental user script to convert SketchUp groups to OpenStudio spaces.

OpenStudio Application 1.1.0
- Improved general performance, stability, and usability.
- Added Utility Bills Sub-tab in support of new calibration feature.
- New HVAC Components (Contributed by Oak Ridge National Laboratory)
  - GroundHeatExchangerVertical - Enables support for ground source heat pumps EvaporativeFluidCoolerSingleSpeed.
  - AirTerminalSingleDuctVAVNoReheat
  - AirTerminalSingleDuctConstantVolumeReheat
- New HVAC Components (Contributed by Group 14)

- o In-slab radiant heating/cooling, including water and electric resistance.
- o Chilled beams, both passive and active.
- Simplified measures library to show OpenStudio, EnergyPlus, and new Reporting measures side by side.
- Added calibration view to Results tab to view utility data side by side with simulation results.

OpenStudio ParametricAnalysisTool 1.1.0
- Simplified measures library to show OpenStudio, EnergyPlus, and new Reporting measures side by side.
- Added several additional Energy Conservation Measures to the Building Component Library, accessible through PAT and the OpenStudio application.
- Added Cloud Settings, Cloud Monitor, and a diagnostic dialog in support of simulations using the Amazon EC2 cloud computing service. Once the user creates an Amazon account and links to it from OpenStudio, OpenStudio can provision and distribute simulations across a user-selected number of EC2 instances.
- The Run tab was redesigned in support of simulations using cloud computing services. This includes a number of new interface elements and characteristics described below.
  - o A cloud status button to display and alter the cloud state.
  - o Design alternatives can now be selected and deselected for simulation. This can be accomplished by clicking on them individually, or by using the "Select All" and "Clear Selection" buttons. Previously there was no selection mechanism, and all design alternatives had to be run.
  - o When a cloud instance is running, there is a new column to choose which design alternatives' detailed simulation results should be downloaded upon completion. You can select these individually or select all, being mindful that simulation results can be quite large.
  - o There is similar functionality to individually or globally clear simulation results.
- A button to download the highlighted design alternatives' detailed simulation results was added to the Results tab.

OpenStudio RunManager 1.1.0
- No changes.

OpenStudio ResultsViewer 1.1.0
- No changes.

OpenStudio Ruby Bindings 1.1.0
- No changes.

OpenStudio C# Bindings 1.1.0
- No changes.

OpenStudio Python Bindings 1.1.0
- No Changes.
- Python bindings are not packaged with OpenStudio. To use them see our [developer page](#) for guidance on building OpenStudio.

OpenStudio JavaScript V8 Bindings 1.1.0
- No Changes.
- JavaScript bindings are not packaged with OpenStudio. To use them see our [developer page](#) for guidance on building OpenStudio.

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. [issue [#28](#)]
- Using SketchUp's undo operation on OpenStudio model elements may produce unexpected results. [issues [#54](#) and [#150](#)]
- 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. [issue [#409](#)]
- 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. [issue [#26](#)]
- 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. [issue [#201](#)]
- 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. [issue [#168](#)]
- "Project Loose Geometry" can crash SketchUp. It is a good idea to save prior to using this to avoid any loss of data. [issue [#484](#)]

- 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.

OpenStudio Application

- When going to the Site / Utility Bills subtab after setting up the prerequisite objects you will see an object that can't be edited. That isn't a real object. To add your first object switch away from the "Electric Utility Bill" category at the left, and then click the green "+" to create a new object. [issue #577]
- 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 unintentionally zoom them in and out. [issue #84]
- 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. [issue #123]
- 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. [issue #196]
- Not all of the schedules required to make a valid People object can be assigned in the application. [issue #107]

OpenStudio ParametricAnalysisTool

- If you plan to run an analysis using the cloud make sure to first run the baseline model locally. This will assure that at simulation results relative to the baseline show up on the results Tab. This is related to a bug in the order in which jobs are run on the cloud.
- As mentioned elsewhere, when using cloud service please make sure to stop the cloud using the cloud button in PAT when your simulation session is done, and after you have downloaded all of the detailed results you want. Then also go the AWS Management Console to confirm the instances are terminated. If they are not terminated, you can manually terminate them from the console.
- 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. [issue #330]
- Daylighting control object variables can't be requested in the output variables tab. [issue #355]
- The results tab may not be legible on a 1024x768 screen. [issue #359]
- 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. [issue #369]
- Always Run measures are applied to externally constructed design alternatives. This may result in unexpected results or errors. [issue #369]

- The run and cloud buttons may appear unresponsive after you click on them, particularly with very large projects. Please give them time, it may take a minute or two for the status to update.

OpenStudio ResultsViewer
- Alias changes do not update in table view until the data are read in again. [issue #25]
- Re-arranged column order doesn't stick next launch. [issue #30]

OpenStudio RunManager
- EnergyPlus ForwardTranslator errors do not appear in the RunManager GUI elements. [issue #181]

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 #239]
- 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. [issue #45]

Bug Analytics Since Previous Release
- 93 new issues were filed since the 1.0.0 release of OpenStudio.
- 127 issues were closed since the 1.0.0 release of OpenStudio.