

# OpenStudio Version 1.14.0

*Release Notes – 12/16/2016*

These release notes describe version 1.14.0 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

## Where to Find OpenStudio Documentation

- OpenStudio release documentation, including these release notes, tutorials, and other user documentation, is available at <https://www.openstudio.net/>.
- C++ API documentation is available at <https://openstudio-sdk-documentation.s3.amazonaws.com/index.html>.
- Measure development documentation is available at [http://nrel.github.io/OpenStudio-user-documentation/reference/measure\\_writing\\_guide/](http://nrel.github.io/OpenStudio-user-documentation/reference/measure_writing_guide/).

## Installation Notes

OpenStudio is supported on Windows 7 – Windows 10, OS X 10.9 – 10.10, and 64-bit Ubuntu 14.04.

OpenStudio 1.14.0 supports EnergyPlus Release 8.6.0, which is bundled with the OpenStudio installer. It is no longer necessary to download and install EnergyPlus separately. Other builds of EnergyPlus are not supported by OpenStudio 1.14.0.

OpenStudio 1.14.0 supports Radiance 5.0.a.8, which is bundled with the OpenStudio installer. It is no longer necessary to download and install Radiance separately. However, an installer is available at <https://github.com/NREL/Radiance/releases/tag/5.0.a.8>. Other builds of Radiance are not supported by OpenStudio 1.14.0.

## Installation Steps

- The OpenStudio SketchUp Plug-in requires [SketchUp 2016](#) (not available for Linux). The OpenStudio SketchUp Plug-in does not support older versions of SketchUp. SketchUp 2016 is available in 32 and 64-bit versions; the 32-bit version of OpenStudio on Windows will only work with the 32-bit version of SketchUp 2016, and the 64-bit version of OpenStudio will only work with the 64-bit version of SketchUp 2016.
  - If the OpenStudio Plug-in does not automatically load in SketchUp, open the Window->Preferences->Extensions window in SketchUp and enable the OpenStudio plug-in if it is listed.
- 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](#).

## Overview

Within EnergyPlus, advanced building controls are typically implemented utilizing the *EnergyManagementSystem* (EMS) suite of objects. This involves defining *Sensors* and *Actuators* that interact with building parameters through *Programs* which are written in the EnergyPlus Runtime Language (ERL). With the creation and larger adoption of OpenStudio Measures, the desire to simulate advanced building and grid interaction related control strategies has only increased. To facilitate those efforts, the EMS objects have been wrapped in both the forward and reverse translators. The model objects are:

```
EnergyManagementSystemActuator
EnergyManagementSystemConstructionIndexVariable
EnergyManagementSystemCurveOrTableIndexVariable
EnergyManagementSystemGlobalVariable
EnergyManagementSystemInternalVariable
EnergyManagementSystemMeteredOutputVariable
EnergyManagementSystemOutputVariable
EnergyManagementSystemProgram
EnergyManagementSystemProgramCallingManager
EnergyManagementSystemSensor
EnergyManagementSystemSubroutine
EnergyManagementSystemTrendVariable
OutputEnergyManagementSystem
```

Currently the interface to include EMS into an OSM is strictly Measure based. Adding these Objects to the GUI in the OS Application is currently being scoped for the upcoming fiscal year, however it is funding dependent.

In the OSM file, most EMS objects will attach directly to Model objects thru their Handles or UIDs. Upon EnergyPlus translation, those UIDs are replaced with Object names. While most Objects have restricted parameters, *Programs* and *Subroutines* can either be defined line by line thru the Measure API or all at once by defining a large string block.

Also, all EMS objects reverse translate so if there are large legacy IDF models, the user can use this to at least get a start on what the new OSM would look like. One caveat is that when a referenced object exists that won't reverse translate, OpenStudio will still translate the EMS object, but leave the referenced field blank and a warning message is thrown. The name of the object that didn't translate is put in a comment above the EMS object so that the user can go find it in the IDF and manually figure out how to connect it up in the new OSM.

In addition to the aforementioned EMS functionality, the following OpenStudio capability was implemented:

- Added BuildingUnit class for grouping Spaces into logical units
- Updated template OpenStudio Measures to work with OpenStudio 1.x and 2.x
- Added fuel type to OtherEquipment and CoilHeatingGas
- Enforce lowercase names in runner.registerValue
- Allow display name to be set instead of value for choice arguments

OpenStudio 1.14.0 includes many bug fixes. For a full list of changes included in OpenStudio 1.14.0, please see the [complete changelog](#).

#### Issue Statistics Since Previous Release

- 22 new issues were filed since the 1.13.0 release of OpenStudio (not including opened pull requests).
- 27 issues were closed since the 1.13.0 release of OpenStudio (not including closed pull requests).