

Price:

Free

Online Rating:



Audience:

Building Designers/Operators/Owners

Energy/LEED Consultants

Universities/Researchers

Building Type:

Commercial

Residential

Country:

United States

Platforms:

Windows

Expertise Required:

Wizard-based - no expertise required

Detailed interface - building technology knowledge required

Inputs:

There are 3 levels provided:

Schematic Design Wizard

→ user friendly - all inputs have defaults

Design Development Wizard

→ User friendly - all inputs have defaults

Detailed Interface

→ Complicated and needs previous expertise - not all inputs have defaults

Outputs:

→ Graphical summary reports for single-run results

→ Parametric tabular reports (compare annual results by enduses, incremental or cumulative results).

→ Non-hourly simulation results (tabular/text DOE-2 SIM file reports)

→ California Title 24 compliance analysis reports.

Capabilities and Special Features:

- Whole-building energy simulation throughout the entire design process
- Comprehensive enough to be used by all design members of a team in the wizard phase

Limitations:

- All inputs have defaults that are based on the California Title 24 building energy code

Pricing:

Free

Online Rating:



Audience:

Mechanical Energy/Control Engineers

Architectural Engineers

Building Product Designers

Portfolio Managers

Energy-efficiency Policy Analysts

Researchers

Building Type:

Commercial

Residential

Country:

United States

Platforms:

Windows

Linux

Mac OS X

Expertise Required:

Building physics or mechanical background is helpful

Inputs:

→ Building description and weather in structured ASCII text files

→ EnergyPlus comes with IDF-Editor, a grid-based wizard that facilitates the creation of simple models and performs input-consistency checks

Outputs:

→ Summary and detailed output in unstructured text (CSV, HTML, and SQLite formats)

→ Comes with a simple output visualization utility (EP-Compare)

Capabilities and Special Features:

- Whole-building energy simulation throughout the entire design process
- HVAC system selection and sizing
- Code compliance
- EnergyPlus building descriptions use a custom object-oriented format
- implements detailed building physics algorithms for heat transfer, air and moisture transfer, light distribution, and water flows
- Functional Mockup Interface import and export for co-simulation with other engines
- Combined heat and mass transfer model that accounts for air movement between zones
- Open-source license



Pricing:

Free

Online Rating:



Audience:

Policy- makers

Researchers

Engineers

Architects

Building Type:

Residential

Commercial

Country:

United States

Platforms:

Windows

Expertise Required:

Basic understanding of the construction and operation → very user-friendly

Inputs:

→ Building geometry and construction characteristics

→ Easy selection of measures for envelope constructions, equipment, appliances, occupancy

→ User-specified location, utility rates, and economic properties

→ Fuel costs and economic data

Outputs:

→ Financial calculations

→ End use breakouts

→ Efficiency measure descriptions

→ Design costs

→ Various graph types are available

Capabilities and Special Features:

- Whole-building energy simulation throughout the entire design process
- Performs analysis in less than a minute
- Measures are tailored for new construction and retrofit applications. Interface allows analyzing specified building designs or optimizing across a range of possible measures
- BEopt performs full life-cycle costing
- Navigation by the user is easy

Limitations

- User limited to only the efficiency measures set in software by default

Pricing:

Free

Online Rating:



Audience:

Builders

Design Evaluators

Engineers

Architects

Energy Code Writers

Building Type:

Residential

Country:

Canada

Platforms:

Windows

Expertise Required:

Basic understanding of the construction and operation of residential buildings

Inputs:

- Building geometry and construction characteristics
- HVAC and domestic hot water specifications
- Geographical location of the house
- Fuel costs and economic data

Outputs:

- Reports on the house analysis
- Weather file
- Economic and financial conditions
- Fuel costs
- Annual heat loss and HVAC load results
- Comparison report allows for the display of results of up to 4 house files at once

Capabilities and Special Features:

- Whole-building energy simulation throughout the entire design process
- Performs analysis in less than a minute
- Load calculations
- Energy conservation measures
- Takes into account thermal bridging through studs in assemblies
- Has a detailed air infiltration model and foundation heat loss model
- The program can be run in English or in French and in metric, Imperial or U.S. units

Limitations

- User support limited since it is not used in industry too much



Pricing:

Free for trial only

Online Rating:



Audience:

Architects

Engineers

Sustainability Consultants

Building Type:

Commercial

Residential

Country:

Globally

Platforms:

Windows

Linux

Mac OS X

Expertise Required:

No specific expertise is required

Inputs:

- Users open their existing models in SketchUp or Revit
- Building location & building type
- Weather data is automatically set based on building location
- Default building specification values are offered for typical building uses. These values can be adjusted and updated as the project develops

Outputs:

- Building energy and water use
- Carbon emissions
- Utility costs
- Renewable energy potential
- Heating and cooling capacity
- Daylight visualizations

Capabilities and Special Features:

- Whole-building energy simulation throughout the entire design process
- Lighting simulation
- Results can be exported directly to CSV and PDF formats creating clear presentation-ready reports.
- Quick comparison of multiple design options and iterations
- Sefaira provides training for new users as part of the subscription as well as access to its published content
- Collaboration with entire project teams anywhere in the world with browser-based software

Pricing:

Reduced for Academic Use
Free to try only

Online Rating:



Audience:

RESNET® HERS® Providers

Home Energy Raters

Utility Programs

Green Building Practices

Building Type:

Residential

Country:

United States

Platforms:

Windows

Expertise Required:

RESNET® HERS® Providers and Home Energy Raters

Inputs:

- Simplified input procedure
- Extensive component libraries
- Automated energy efficient improvement analysis
- Duct condition and leakage analysis
- Latent and sensible cooling analysis
- Lighting and appliance audit
- Active and passive solar analysis

Outputs:

- Complies with RESNET® National Home Energy Rating Standards as promulgated by the Residential Energy Services Network (RESNET®)
- Calculates energy loads
- Consumption and costs
- Sizes mechanical equipment and performs automatic International Energy Conservation Code compliance analysis

Capabilities and Special Features:

- Whole-building simulation
- Code compliance
- Ratings and certificates
- Single family and multifamily residential energy modeling

Limitations:

- Only applicable for residential energy modeling

Pricing:

Reduced for Academic Use
Free to try only

Online Rating:



Audience:

Architects

Engineers

Building Designers/Scientists

Academic Research/Teaching

Building Type:

Commercial

Residential

Country:

United

Platforms:

Windows

Expertise Required:

No expertise required- beginners and students can learn DesignBuilder faster than with comparable tools

Inputs:

→ Building models are assembled simply by positioning, stretching and cutting 'blocks' in 3-D space

→ Building geometry can be imported from 3D BIM models, drawn freehand or from imported 2D floor plans

→ Data management system enables you to input the most common data at the site, building, block, zone or surface levels so that it is then automatically set for all attributes in the levels sitting below that

Outputs:

→ Internal air, mean radiant and operative temperatures and humidity

→ Site weather data

→ Heat transmission through building fabric

→ Heating and cooling loads

→ Emissions of CO2 and other pollutants

→ Data can be displayed graphically or in tabular form and can be exported in a range of formats to spreadsheet and custom

Capabilities and Special Features:

- Whole-building Energy Simulation
- Load Calculations
- Parametrics and optimization
- Ratings and certificates
- Air flow simulation
- Enables you to develop one core model and use it to run a variety of analysis types using different engines (EnergyPlus, Radiance, or CFD)

Pricing:

Free to try only

Online Rating:



Audience:

Engineers

Architects

Sustainability and Energy Consultants

Building Owners

Facilities Managers and Contractors

Academics/Research

Building Type:

Commercial

Residential

Country:

United Kingdom

Platforms:

Windows

Mac OS X

Expertise Required:

IES Training offers a range of training options

Inputs:

→ Imported from drawing tool you are using into the IESVE for analysis or create the geometry from scratch in Modellt

→ Ability to copy/paste input data to/from Excel directly

→ Materials, occupancy, internal gains, climate, weather files, air movement and systems are managed entirely through graphical interfaces and supported by extensive databases

→ Various weather data is available

Outputs:

→ IES charts can be edited within IES

→ The Hone tool lets the User investigate the trade-offs between different design parameters

→ Extensive range of standard reports relating to HVAC reports for buildings, system, zone, and room loads, sizing, and ventilation

→ Movies generated in various applications can be recorded as .avi files

→ Ventilation analysis can be aided by overlaying a wind-rose on the model

Capabilities and Special Features:

- Whole-body energy simulation
- HVAC system selection and sizing
- Code Compliance
- Unrivalled interoperability with other CAD/BIM platforms
- IES enables the User to easily switch between ISO, ASHRAE and CIBSE formats
- allows you to create your own scripts

Sources Cited:

BEST Directory. (2018). *EQUEST*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/equest>

BEST Directory. (2018). *EnergyPlus*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/energyplus>

GBM Research. (2014). *Optimizing Multifamily Buildings*.. Retrieved from GBM Research: <https://www.greenbuildermedia.com/buildingscience/blog/optimizing-multifamily-buildings>

BEopt. (2018). *Features*. Retrieved from BEopt and Building Energy Optimizations Tool: <https://beopt.nrel.gov/features>

CEEE. (2018). *Building Energy Optimization (BEopt™)*. Retrieved from Copenhagen Centre on Energy Efficiency: <http://kms.energyefficiencycentre.org/tool-instrument/building-energy-optimization-beopt%E2%84%A2>

BEST Directory. (2018). *HOT2000*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/hot2000>

BEST Directory. (2018). *Sefaira Architecture*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/sefaira-architecture>

BEST Directory. (2018). *REM/Rate*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/remrate-0>

BEST Directory. (2018). *DesignBuilder*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/designbuilder>

BEST Directory. (2018). *IES Virtual Environment*. Retrieved from Building Energy Software Tools, Formerly hosted by US Dept. of Energy: <https://www.buildingenergysoftwaretools.com/software/ies-virtual-environment>