Tax Deduction Qualified Software

IES <Virtual Environment> version 6.3

On this page you'll find information about the IES <Virtual Environment> version 6.3 qualified computer software (www.buildings.energy.gov/qualified_software.html), which calculates energy and power cost savings that meet federal tax incentive requirements for commercial buildings.

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Statements in quotes are from the software developer.

Internal Revenue Code §179D (c)(1) and (d) Regulations Notice 2006-52, Section 6 requirements as amplified by Notice 2008-40, Section 4 requirements.	
(1) The name, address, and (if applicable) web site of the software developer;	Integrated Environmental Solutions Limited Helix Building, West Of Scotland Science Park, Glasgow G20 0SP United Kingdom http://www.iesve.com
(2) The name, email address, and telephone number of the person to contact for further information regarding the software;	Liam Buckley Integrated Environmental Solutions +1 (617) 426-1890 support@iesVE.com
(3) The name, version, or other identifier of the software as it will appear on the list;	IES <Virtual Environment>6.3
(4) All test results, input files, output files, weather data, modeler reports, and the executable version of the software with which the tests were conducted; and	Provided to DOE
(5) A declaration by the developer of the software, made under penalties of perjury, that—	"On behalf of the IES <Virtual Environment> development team, I certify the following: "
(a) The software has been tested according to ANSI/ASHRAE Standard 140-2007 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs;	"The software has been tested according to ANSI/ASHRAE Standard 140-2007 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs."
(b) The software can model explicitly—	"The IES <Virtual Environment> software is fully compliant with ASHRAE 90.1-2001 and meets all of the below requirements."
(i) 8,760 hours per year;	"The <VE>6.3 software complies."
(ii) Calculation methodologies for the building components being modeled;	"The <VE>6.3 software complies."
(iii) Hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints, and HVAC system operation, defined separately for each day of the week and holidays;	"The <VE>6.3 software complies. This includes both schedules and the use of formula profiles to control gains based upon sensed variables."
(iv) Thermal mass effects;	"The <VE>6.3 software complies. This includes thermally

	massive constructions receiving direct and diffuse solar gain after it has passed through envelope apertures, heating and cooling of thermal mass via encapsulated hydronic circuits or air flow paths, and direct radiant exchange between interior surfaces." "
(v) Ten or more thermal zones;	"The <VE>6.3 software complies."
(vi) Part-load performance curves for mechanical equipment;	"The <VE>6.3 software complies."
(vii) Capacity and efficiency correction curves for mechanical heating and cooling equipment; and	"The <VE>6.3 software complies."
(viii) Air-side and water-side economizers with integrated control.	" The <VE> 6.3 software complies with the air-side economizer requirements, including control to dry-bulb high limits, dew-point temperature high limits, differential enthalpy, etc. It provides for modeling water-side economizers (WSE) with non-integrated controls for chilled water loops served by an electric water-cooled chiller and cooling tower; parallel (strainer cycle) WSE applications can be modeled using dedicated coils and cooling tower models; fully integrated WSE operation will be provided in a subsequent release."
(c) The software can explicitly model each of the following HVAC systems listed in Appendix G of Standard 90.1-2004:	
(i) Packaged Terminal Air Conditioner (PTAC) (air source), single-zone package (through the wall), multi-zone hydronic loop, air-to-air DX coil cooling, central boiler, hot water coil.	"The <VE>6.3 software models this system."
(ii) Packaged Terminal Heat Pump (PTHP) (air source), single-zone package (through the wall), air-to-air DX coil heat/cool.	"The <VE>6.3 software models this system."
(iii) Packaged Single Zone Air Conditioner (PSZ-AC), single-zone air, air-to-air DX coil cool, gas coil, constant-speed fan.	"The <VE>6.3 software models this system."
(iv) Packaged Single Zone Heat Pump (PSZ-HP), single-zone air, air-to-air DX coil cool/heat, constant-speed fan.	"The <VE>6.3 software models this system."
(v) Packaged Variable-Air-Volume (PVAV) with reheat, multi-zone hydronic loop, air-to-air DX coil, VAV fan, boiler, hot water VAV terminal boxes.	"The <VE>6.3 software models this system."
(vi) Packaged Variable-Air-Volume with parallel fan powered boxes (PVAV with PFP boxes), multi-zone air, DX coil, VAV fan, fan-powered induction boxes, electric reheat.	"The <VE> 6.3 software models this system; this includes "dual-max" VAV airflow controls, and series, parallel, and other configurations for fan-powered boxes and induction units."
(vii) Variable-Air-Volume (VAV) with	"The <VE> 6.3 software models this system, including detailed

reheat, multi-zone air; multi-zone hydronic loop, air-handling unit, chilled water coil, hot water coil, VAV fan, chiller, boiler, hot water VAV boxes.	models for coils, waterside loops, heating and cooling equipment sequencing, air and water supply temperature resets, air-handling units, "dual-max" VAV airflow controls, and other controls."
(viii) Variable-Air-Volume with parallel fan powered boxes (VAV with PFP boxes), multi-zone air, air-handling unit, chilled water coil, hot water coil, VAV fan, chiller, fan-powered induction boxes, electric reheat.	"The <VE> 6.3 software models this system, including all waterside loops and equipment and all airside components and controls."
(d) The software can—	
(i) Either directly determine energy and power costs or produce hourly reports of energy use by energy source suitable for determining energy and power costs separately; and	"The <VE> 6.3 software complies. This includes detailed energy end-use results as well as user inputs for calculating energy cost based upon complex utility rate structures."
(ii) Design load calculations to determine required HVAC equipment capacities and air and water flow rates.	"The <VE> 6.3 software complies and does so using the ASHRAE Heat Balance Method and design day data for determination of design space loads, including oversizing factors when specified, plus actual simulation of the model and systems to determine sizing for boilers, chillers, other heating and cooling sources, fans, and coils."
(e) The software can explicitly model:	
(i) Natural ventilation.	"The <VE> 6.3 software models multi-zone natural ventilation, including single-sided, cross-ventilation, and thermal stack effect. The <VE> 6.3 software uses a fully integrated bulk-airflow model. All openings are controllable and can be individually user-defined or selected from pre-defined openings with associated aerodynamic properties. Each is assigned wind-pressure coefficients reflecting its height, degree of exposure/sheltering, and relationship to the wind angle of attack at each time step. The integrated bulk-airflow model runs for each time step of the thermal model, thus accounting for pressure differentials associated with wind, mechanical system airflow and thermal inputs, including solar gains, internal gains, and both surface and air temperatures.."
(ii) Mixed mode (natural and mechanical) ventilation.	"The <VE> 6.3 software models mixed-mode ventilation, as described above for natural ventilation, plus controls for seasonal change-over, zone-by-zone operation, coincident operation, and demand control integration with zone-level or system-level CO_2 sensors."
(iii) Earth tempering of outdoor air.	"The <VE> 6.3 software models earth tempering of outside air through earth tubes and thermal labyrinths with airflow driven by mechanical system fans, thermal stack effects, or both."
(iv) Displacement ventilation.	"The <VE> 6.3 software models both thermal displacement ventilation and underfloor air distribution systems, either separately or in combination with other systems, accounting for thermal gain in the underfloor plenum (for UFAD systems), separate occupied and stratified zones, separate return plenum where applicable, and a wide range of configurations for

	underfloor fan-powered boxes and associated controls."
(v) Evaporative cooling.	"The <VE> 6.3 software models both indirect and direct evaporative cooling, including bypass dampers and accounting for the added static pressure that must be overcome when air is passing through cooling components or any similar coil, heat exchanger, or heat/enthalpy recovery element."
(vi) Water use by occupants for cooking, cleaning or other domestic uses.	"The <VE> 6.3 software models water use by occupants. This includes tools for estimating fixture water consumption, rainwater collection, graywater recycling, etc."
(vii) Water use by heating, cooling, or other equipment, or for on-site landscaping.	"The <VE> 6.3 software does not model water use by heating, cooling, and other equipment or for on-site landscaping."
(viii) Automatic interior or exterior lighting controls (such as occupancy, photocells, or time-clocks).	"The <VE> 6.3 software models automatic interior and exterior lighting controls, such as occupancy sensors, time-clocks, and daylight-sensitive photocells for stepped or continuous dimming of electric lighting and the associated reduction of energy use and thermal gains."
(ix) Daylighting (sidelighting, skylights, or tubular daylight devices).	"The <VE> 6.3 software provides detailed modeling of daylighting through all orientations of glazed fenestration, including side-lighting and skylights, inter-zonal borrowed light, custompositioned and oriented daylight sensors, contrast ratios, and glare. While one or more tubular daylight devices can be modeled in RadianceIES, the level of detail required would impractical for most energy models; such devices can be otherwise approximated."
(x) Improved fan system efficiency through static pressure reset.	"The <VE> 6.3 software can model improved fan system efficiency through static pressure reset via controlled mixing of alternate flow paths, each with an associated static pressure curve; however, this is not a pre-defined system configuration. The maintenance of a static pressure setpoint to control a variable speed fan, on the other hand, is readily modeled and is standard on all pre-defined multi-zone VAV systems."
(xi) Radiant heating or cooling (low or high temperature).	"The <VE> 6.3 software models low temperature radiant systems, including radiators, chilled ceiling panels, and hydronic radiant heating and cooling slab systems; this includes slab surface temperature sensors and fully integrated control for coincident operation of hydronic cooling and airside systems."
(xii) Multiple or variable-speed control for fans, cooling equipment, or cooling towers.	"The <VE> 6.3 software models multiple or variable-speed control for fans, cooling equipment, and cooling towers."
(xiii) On-site energy systems (such as combined heat and power systems, fuel cells, solar photovoltaic, solar thermal, or wind).	"The <VE> 6.3 software models on-site energy systems, including solar thermal DHW systems, wind power generators, photovoltaic arrays, and combined heat & power systems."

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