VOLUME 27, NO. 3 -- MARCH 2006

*EnergyPlus*SPARK*DOE-2*BLAST*EnergyPlus*VisualSPARK*DOE-2*BLAST*GenOpt*EnergyPlus*
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BUILDING ENERGY SIMULATION ★ USER NEWS

*EnergyPlus*SPARK*DOE-2*BLAST*EnergyPlus*VisualSPARK*DOE-2*BLAST*GenOpt*EnergyPlus*
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Highlights

Software

Departments

The Buzz

The newsletter features of Ask an EnergyPlus Expert and DOE-2 Modeling Tips have been compiled for 2005. Click on the active links above or go to our publications page at http://SimulationResearch.lbl.gov

***EnergyPlus Training**: Workshops for both beginning and advanced users are being held in selected cities. The tentative schedule is as follows: either Portland or Seattle in May, and in Cambridge, Mass, on August 1. For details, go to www.gard.com/training.htm*

If you want to be listed as an EnergyPlus or DOE-2 consultant in this newsletter and on the Building Simulation web site, email klellington@lbl.gov.

PUB-439

EnergyPlus – New Features in Release 1.2.3

Datasets

- Updated all design conditions to match new 2005 ASHRAE Fundamentals data in the weather files and associated design day data
- Extensive set of new example summary report templates for:
  - Space Gains/Envelope/Daylight/Comfort
  - Peak Demand and Consumption
  - Unglazed Transpired Solar Collector
  - HVAC/Electrical Systems/Loops/Components
  - Outdoor Conditions

Input

- Example input files for all new features (more than 200 example files available)
- All example input files have been updated and new documentation of features added
- New weather data for 100 international weather locations including India, Portugal, Brazil, China, Ethiopia, Ghana, Kenya, and Nepal in the EnergyPlus/ESP-r weather format (975 locations available worldwide)
- Revised design days to accommodate "enthalpy" and "humidity ratio" as potential humidity indicating types based on 2005 ASHRAE Fundamentals

Geometry/Windows/Walls/Shading

- User-definable radiation view factors

Zone Model

- User-definable room air temperature distribution model (at this time, for research only)

Electrical Power

- Demand limiting controls

HVAC

- Simple Water to Water GSHP
- Packaged Terminal Heat Pump
- Return air bypass
- Heat Pump Water Heater
- Desuperheater Water Heating Coil
- Steam loop, steam coil, steam boiler
- Restructured plant loop modeling to support branch pumps and future headered pumps and extensions of controls simulation
- Branch supply pumps for supply side equipment such as chillers, boilers, heat pumps, and water heaters
- Simple ice storage tank

On-Site Energy Supply

- Solid Oxide Fuel Cells (research only--for more information on this model contact EnergyPlus-Support@gard.com)

To EnergyPlus Documentation

http://www.eere.energy.gov/buildings/energyplus/documentation.html

EnergyPlus – New Features in Release 1.2.3

Continued

Output

- DXF:Wireframe
- New report variables including power and breakout of separate object-level variables for all internal gains objects.
- New report variables to monitor zone temperature when heating and cooling setpoints are not met and when they are not met during occupancy, when zone temperatures oscillate due to poor simulation, and when zone conditions are outside the ASHRAE Standard 55-2004 comfort region.
- Output reporting enhancements including optional unit conversion for J into kWh, MJ or GJ in tabular output; new schedule support for TimeBins report; and table of contents for HTML tabular output files.

Utilities

- New features in EP-Launch including new quick open panel for opening output files, composite error file for group simulations, and integration with the Transition utility to automatically update files to the latest version.
- Many IDF Editor improvements including resizable window regions, opening DDY files, and pull-down list of report variable names from RDD output file.
- New unit conversion utility produces output in user-definable units
- Many new HVAC Diagram capabilities including draws "dangling" pieces that fit together that were not drawn as part of loop, draws lines to represent the loop coming back to the start, long names now wrap to two lines within boxes, and faintly drawn lines connect items that appear in multiple loops such as coils.

Documentation and Guides

- Input/Output Reference and Engineering Reference have been updated and extended for all new features and updates, bringing total documentation to more than 2500 pages.

EnergyPlus Version 1.2.3 ✦ Interim Build (#31) ✦ Released December 14, 2005

A new version of EnergyPlus (1.2.3 build 31) was released for both the Windows and Linux operating systems. Download v 1.2.3 from http://www.energyplus.gov. Why a new version just two months after the last one? There are a few cool new features that we wanted to get out to you and some bug fixes that we didn't want to leave till Version 1.3 (scheduled for release in April 2006).

What's New in EnergyPlus Version 1.2.3 Build 31 ???

- UFAD (Underfloor Air Distribution) for interior zones is now available as an alternative RoomAir option. (Exterior zones UFAD are planned for April 2006.)
- Detailed coil models can now be auto-sized.
- Ventilation improved with the addition of maximum indoor temperature, minimum/maximum outdoor temperatures, and maximum wind speed to help control natural ventilation.

Ask an EnergyPlus Expert

SCRIPTS, BATCH FILES

I'm trying to find a way to automatically do lots of runs in EnergyPlus. I need to do a single parametric sensitivity analysis and, therefore, need to vary one parameter at a time, save the file, run it and check the results. I had a look at the macros but I'm not sure if they are appropriate as it seems to me that each file needs to be specified anyway and saves should be done manually. I thought I could use the ##def to define all my variables in some files and then use the ##if and/or ##include to substitute each one in the "basic" .idf file but I couldn't find a way to save the file each time before running. So now I have a collection of input files - each of them with only one different variable! I opened a macro example and saw that a macro command should be included inside the .idf file so that it calls the corresponding .imf file. However, I need to use the same .idf file many times, changing one of the variables each time. By doing this I would need to save the files manually if I decide to use a macro command. So, the only way to do a parametric sensitivity analysis is to write a script in order to manipulate the .idf text files – right?

Answer
It is not necessary to save the files manually. The imf macro system is designed to do exactly what you want. You can run thousands of parametric runs all from a single imf input file. Remember that the epmidf output file is saved for future reference, and it shows the final resulting input for EnergyPlus after all macro processing is completed. The key is to use an output file naming scheme that prevents the outputs from overwriting each other.

One option for doing this is to use the Group capability in EP-Launch (see the Getting Started document). Make your master input file a *.imf file (which can then have ##includes of other idf or imf files). With the EP-Launch group simulations, there is an optional counter for running the same file multiple times. A file called "COUNTER.INC" is written prior to each simulation which sets a macro variable called "Counter." The imf input file can then have ##IF blocks that set other variables based on the current value of counter[].

Another option is to write your own batch files which call runeplus.bat. Again, the approach to use is to have the batch file write a short file such as "parameters.inc" (can be any extension you like) with ##set1 statements in it to set the desired parameters for a single run. Then in the master imf file ##include parameters.inc at the top of the file. Then the rest of the file can have ##IF block that are controlled by the variables which were set in parameters.inc.

We know this is rather confusing at first, but it turns out to be quite simple and powerful once you get past the initial learning curve.

From the March-to-August 2003 User News …

Question
I have to run quite a lot of (large and time consuming) simulations. Is it possible to use a batch file to queue the IDF files?

Answer
Yes, you can run EnergyPlus with batch files. There is a batch file included, called "RunEplus.bat" in the main EnergyPlus folder. Just write another batch file which calls RunEPlus.bat multiple times. (Note, use the "call" command to execute RunEPlus so that the main batch file will wait until it is complete). For more information about RunEplus.bat, see the Getting Started document, pp. 14-18.

Find EnergyPlus Documentation At

http://www.eere.energy.gov/buildings/energyplus/documentation.html

Ask an EnergyPlus Expert

COMIS AND NODES

I have a one zone model and use COMIS for natural ventilation. I need to determine mass flow through two openings on opposite sides of the zone and I need to define two external nodes at each of the two windows through which the air flows. But can I define a node in the middle of the zone for use only in COMIS? I can't find it in the manual? Only thing I can find is the defining of nodes for all types of mechanical ventilation. Or do i use 'Air mass flow from fromzone to tozone' for this?

Answer

The nodes used in the HVAC system inputs are not the same nodes used in the COMIS simulation. "Air Flow from FromZone to ToZone through COMIS Link" (and the reverse "Air Flow from ToZone to FromZone through COMIS Link") are what you want to report. Note that large openings can have bidirectional flow (for example, air can flow out the top of a large open window and flow in at the bottom) so you need to report both directions.

The Air Mass Flow FromZone to ToZone report variable describes the air flow across a surface (from an external node to a zone node).

The external node you describe is required (or not) based on the input for the COMIS Simulation object.

From the IO Reference manual:

COMIS Simulation object

Field: Wind Pressure Coefficients

Determines whether the wind pressure coefficients are input or calculated. The choices are INPUT or SURFACE-AVERAGE CALCULATION.

- If INPUT, you must enter a COMIS CP Array object, one or more COMIS External Node objects and one or more COMIS CP Values objects.
- The second choice, SURFACE-AVERAGE CALCULATION, should only be used for rectangular buildings. In this case surface-average wind pressure coefficients vs. wind direction are calculated by the program for the four vertical facades and the roof based on your entries for "Building Type," "Azimuth Angle of Long Axis of Building," and "Ratio of Building Width Along Short Axis to Width Along Long Axis" (see description of the following three fields). With this choice you do not have to enter any of the following objects: COMIS CP Array, COMIS External Node and COMIS CP Values. The calculated wind pressure coefficients are shown in the eplusout.cif file (see the example COMIS input file, next page).

Continued on the next page

Ask an EnergyPlus Expert

COMIS AND NODES (CONTINUED)

Use this method when the wind pressure coefficients field is set to INPUT:

```
COMIS EXTERNAL NODE,
  SFacade,          !- Name
  1.0;              !- Outside Pollutant Concentration Factor
{dimensionless}

COMIS SURFACE DATA,
  Surface_1,        !- Name of Associated EnergyPlus Surface
  CR-1,             !- Name of Air Flow Crack or Opening Type
  SFacade,          !- External Node Name
  1;                !- Crack Actual Value or Window Open Factor for
Ventilation {dimensionless}
```

Use this method when the wind pressure coefficients field is set to SURFACE-AVERAGE CALCULATION:

```
COMIS SURFACE DATA,
  Surface_1,         !- Name of Associated EnergyPlus Surface
  CR-1,              !- Name of Air Flow Crack or Opening Type
  ,                  !- External Node Name
  1;                 !- Crack Actual Value or Window Open Factor for
Ventilation {dimensionless}
```

For COMIS inputs you do not specify an internal node in a zone, use the zone name in the COMIS Zone Data objects and a surface name in the COMIS Surface Data object.

So try outputting the Air Mass Flow FromZone to ToZone and Air Mass Flow ToZone to FromZone report variables and see what happens.

BYPASS

I am modeling a huge building and am only simulating only the building side (and not the plant). I understand that I need to use only purchased chilled water supply and purchased hot water supply instead of chiller and boiler, respectively. Now coming to my question. Do I really need to use bypass pipes for each purchased chilled water and purchased hot water.

Answer
Bypass pipes should not be necessary if the pump is intermittent, but it never hurts to have one even if it is never used.

I am puzzled that you say for "each purchased chilled water and purchased hot water". You only need one purchased chilled water and one purchased hot water to supply the entire building. One hot water loop supplying all hot water coils with a single purchased hot water supply object. Likewise for the chilled water side. For an example, see the hot water loop in TermReheat.idf

Ask an EnergyPlus Expert

ATTACHED SHADING SURFACE

I have an attached shading surface with some openings. However, I don't know how to describe these openings geometrically. I've considered using the field " Fraction of Shading Surface That Is Glazed" in shading the surface reflectance object without geometrically describing the openings. Then, to model the openings, I would use a window glass with very high transmittance and very low reflectance. Would this be correct?

Answer
"Fraction of Shading Surface That Is Glazed" in shading surface reflectance only affects the way the shading surface ***reflects*** sunlight, it does not alter the transmittance of the shading surface.

Shading surfaces are opaque, unless the the transmittance schedule (field "TransSchedShadowSurf") has values greater than 0.0. The easiest option is to set the shading surface transmittance schedule to AreaOfHoles divided by TotalAreaOfShade.

INTERNAL GAIN FROM LIGHTS

I need to set the design level of lights in order to calculate internal gain. According to daylighting illuminance, some fraction of the lights are switched on or not. Does EnergyPlus consider that situation while calculating the internal gains of lighting? I know there is a relation between the lighting consumption and daylighting illuminance, but is there also any relation between internal gain of lighting and daylighting?

Answer
Yes. When the power consumption of LIGHTS is reduced by daylighting controls, the internal heat gain is also reduced. The following report variables can be used to verify this: Ltg Power Multiplier from Daylighting, Lights Total Heat Gain, Lights Electric Consumption, Zone Total Internal Total Heat Gain.

OUTSIDE AIR NODES

I am using room AC packaged units with outside air mixers, fans, DX heaingt and cooling coils and electric heaters. If I use a common outside air node (NOUTSIDE) for all the room AC units and the outside air mixers, I get lots of Warning and Severe messages. If I use a different outside air node for each room unit (e.g., NOUTSIDE1, NOUTSIDE2, etc.), then I get no errors.
Why can't I use a common outside air node?

Answer
Each outside air inlet node must be unique. Why? Because the outside controller, or in this case the window AC unit, sets the mass flow rate on the outside air inlet node. Then the mixer component, which is passive, takes the mass flow present on the outside air inlet node and mixes it with the flow from the return air node. HVAC nodes in EnergyPlus are single point inlets or outlets to a piece of equipment.

Ask an EnergyPlus Expert

REPORT -- MAXIMUM HEATING RATE VALUES

I have noticed that maximum heating rate values obtained with Report:Table:Monthly are very different(much larger)than the ones that can be obtained from the report of heating rates in Report Variable. This happens when using Purchased Heating as well as with a Heat Pump System. Am I overlooking something or doing something wrong ?

Answer
Max values in table reports are computed for each timestep. Our guess is that the report variables are being reported hourly, so you are only getting the maximum rate averaged over one hour in that view. Set the REPORT VARIABLE reporting frequency to TIMESTEP (for Zone timestep variables) or DETAILED (for HVAC timestep variables), and the max values should match what is reported in the table report.

CONTROL NODE SETUP

I have a fixed flow system feeding two zones. On the air loop there's a cooling coil and a supply fan followed by a steam humidifier. Then I have two separate reheat coils serving the two zones. In these zones I want to control both the temperature and the humidity.

I have a CONTROLLER:SIMPLE for each of the coils (one cooling, two reheats) and SET POINT MANAGER:SINGLE ZONE REHEAT for the reheats and SET POINT MANAGER:SINGLE ZONE COOLING for the cooling coil.

I'm able to get control of the RH or the temperature in the zones but not both at the same time.

Could my control nodes be the source of the problem?

Answer
Since you have two reheat coils, I assume that they are part of a terminal unit such as SINGLE DUCT:CONST VOLUME:REHEAT or SINGLE DUCT:VAV:REHEAT. These components have the reheat controls built into the terminal unit and do not require a set point manager or a CONTROLLER:SIMPLE object. SET POINT MANAGER:SINGLE ZONE REHEAT is used to control coils in the main branch of an air loop, not in terminal units.

To control dehumidification, the cooling coil requires both a temperature set point manager and a Set Point Manager:Single Zone Max Hum to override when humidity control is required.

If this system is serving two zones, SET POINT MANAGER:SINGLE ZONE COOLING will not work, because it will control the cooling coil for only the single zone to which it is attached. SET POINT MANAGER:WARMEST may be better for this application.

Find EnergyPlus Documentation At

http://www.eere.energy.gov/buildings/energyplus/documentation.html

EnergyPlus NEW WEATHER FILES

We have just published new weather data in EnergyPlus format on our web site:

Egyptian Typical Meteorological Year (ETMY)
A set of 10 typical year weather files for locations throughout Eqypt, developed by Joe Huang, Joe Huang and Associates.

Chinese Standard Weather Data (CSWD)
A set of 270 typical year weather files for locations throughout China, developed by Tsinghua University and China Meteorological Bureau.

Kuwait Weather Data from Kuwait Institute for Scientific Research (KISR)
Two weather files for Kuwait based on measured meteorological data for Kuwait International Airport and KISR's coastal weather station.

This brings the total number of weather data locations available on the web site to more than 1100 (some locations have multiple sources of data). More information about data sources is available here: http://www.eere.energy.gov/buildings/energyplus/weatherdata_sources.html

The EnergyPlus Team

All weather data are available at
http://www.eere.energy.gov/buildings/energyplus/cfm/weather_data.cfm .
If you know of other typical weather data that could be shared with EnergyPlus users, please contact Dru Crawley or Linda Lawrie directly.

2006 EnergyPlus Training

? **May ???**	**Seattle, Washington or Portland, Oregon** We are currently seeking hosts for a Portland/Seattle workshop in May 2006, or for additional sites if there is sufficient interest. If your organization would like to host an EnergyPlus workshop, please contact EnergyPlus-Training@gard.com Hosting may cover a range of services, and can be as simple as providing a meeting room for up to 20 participants with laptops. Free registrations may be made available to the host organization.
August 01	**Cambridge, Massachusetts (at MIT)** Immediately before the IBPSA-USA SimBuild Conference at MIT Early registration deadline is June 28, 2006; Registration closes after July 24

http://www.gard.com/training.htm

EnergyPlus Version 1.2.3

Download a free copy of the program

http://www.energyplus.gov/

Support Tools

Support software is listed on our website (http://SimulationResearch.lbl.gov/EP/ep_tools.html) and in Section 2 of this newsletter.

Weather Data from http://www.eere.energy.gov/buildings/energyplus/cfm/weather_data.cfm

Weather data for more than 800 locations are now available in EnergyPlus weather format. See the write-up on how to create Meteonorm files for EnergyPlus.

Ask an EnergyPlus Expert

Questions from EnergyPlus users are answered promptly via email by program developers. To submit questions, join the EnergyPlus User Group at http://groups.yahoo.com/group/EnergyPlus_Support/.
A selection of questions/answers are compiled (yearly) into a downloadable PDF document: Q and A for 2002, Q and A for 2003, Q and A for 2004. Q and A for 2005

Are you an EnergyPlus Consultant ?

If you are engaged in EnergyPlus consulting, and would like to be listed in the *Building Energy Simulation User News* and on our website (http://SimulationResearch.lbl.gov), please send details to klellington@lbl.gov.

Join the EnergyPlus User Group

The developers of EnergyPlus have formed a support group to foster discussion and maintain an archive of information for program Users. We invite questions about program usage and suggestions for improvement to the code. Go to http://groups.yahoo.com/group/EnergyPlus_Support/

Testing and Validation http://www.eere.energy.gov/buildings/energyplus/testing.html.

EnergyPlus is being developed by University of Illinois and Lawrence Berkeley National Laboratory, with the assistance of DHL Consulting, C. O. Pedersen Associates, Florida Solar Energy Center, GARD Analytics, the National Renewable Energy Laboratory, Oklahoma State University and others. Development of EnergyPlus is supported by the U. S. Department of Energy, Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technologies Program (Program Manager, Dru Crawley).

The Forecast Looks Favorable for …

(Free!) Weather Data on Demand

Access archived weather data from around the world through this U.S. DOE web interface:

www.eere.energy.gov/buildings/energyplus/cfm/weatherdata/weather_request.cfm

Hourly weather data is continuously collected and stored into a local database, available through this web interface. Most stations have information for dry bulb temperature, wet bulb temperature, wind speed/direction, atmospheric pressure, visibility, cloud conditions, and precipitation type.

Spotlight on SPARK – Part 2 of 5

Frequently Asked Questions about the Simulation Problem Analysis and Research Kernel Software

Download VisualSPARK 2.01 (Free!) from http://gundog.lbl.gov/VS/vs201_eula.html

This is a list of frequently asked questions (FAQ) for VisualSPARK users. If you need help for something that is not covered by the SPARK Reference Manual, the SPARK Atomic Class API, the SPARK Problem Driver API, or this FAQ, please email us.

This FAQ is intended to supplement, not replace, the SPARK documentation. Before emailing us a question, you should first check to see if the topic is covered in the various manuals.

SPARK Runtime Controls

- **How to perform a simulation with adaptive time stepping?**
- **How to specify an "infinite" final time?**
- **How to generate reports for all computed steps?**

Runtime control parameters for the simulation run are specified in an ASCII file with extension *.run using the so-called preference syntax. The preference syntax relies on set of parenthesis "( )" to identify the various tokens in a tree-like structure. In this section we discuss issues pertaining to the runtime control parameters only, independent of the file format.

How to perform a simulation with adaptive time stepping?

In order to perform a simulation with adaptive time stepping you should set the key VariableTimeStep to 1 in the *.run file. By default, it is set to 0, which will perform a simulation with constant time step.

```
( ...
  VariableTimeStep   ( 1  ())
  MinTimeStep       ( 1.0e-6 ())
  MaxTimeStep       ( 10.0 ())
  ...
)
```

When performing a simulation with variable time stepping it is recommended to also set the minimum allowed time step and the maximum allowed time step using the keys MinTimeStep and MaxTimeStep.

Setting the key VariableTimeStep to 1 in the *.run file tells the solver that it should adapt the time step to respond to various time-related requests. For example, the solver will try to synchronize the global time with the user-requested meeting points or the various report and input events. However, the most important application of the adaptive time stepping operation is in conjunction with the new integrator classes that provide automatic integration error control. These new integrator atomic classes adapt the simulation time step so that the estimated integration error in the dynamic variables satisfies the prescribed relative tolerance specified in the global settings section of the preference settings file.

The new integrator atomic classes can be found in the globalclass directory of your VisualSPARK installation. They are named after the template filename integrator_*method*.cc . Since they define the same port interface as the other integrator classes they can be readily used simply by changing the name of the integrator class in the DECLARE statements.

How to specify an "infinite" final time?

When using the '*' meta-character for the FinalTime entry, you essentially tell the SPARK solver to run the simulation until "infinity". However, because of the fixed-length representation of numbers on computers, infinity really means some large number. Therefore, the simulation will run until the value for the global time variable reaches the biggest possible floating point number in double precision. On a 64-bit architecture with an 8-byte representation of a double type this corresponds approximately to 1.7E+308.

```
( ...
  FinalTime    ( *   ())
  ...
)
```

How to generate reports for all computed steps?

Specifying a ReportCycle of zero essentially forces the simulator to report the solution values at each computed step. However, a negative report cycle value does not make sense.

```
( ...
  FirstReport    ( 0.0   ())
  ReportCycle    ( 0.0   ())
  ...
)
```

More Frequently Asked Questions in the next Newsletter !!

DOE-2

DOE-2.1E (version 121) 1,000-Zone version for Windows from ESTSC; other vendors of DOE-2 based programs are listed on our website: http://SimulationResearch.lbl.gov/.

Cost is as follows:
$ 300 U.S. Government/Non-Profits/Education
$ 575 U.S. Public, Mexico, Canada
$1129 to $1268 Other Foreign

DOE-2 Documentation on a CD from ESTSC - Cost US$100

What is included on the CD?

DOE-2 Reference Manual (Part 1) and (Part 2)
DOE-2 Engineers Manual (2.1A)
DOE-2 BDL Summary (2.1E)
DOE-2 Supplement to the Reference Manual (2.1E)

Order Software and ESTSC Documentation

Ed Kidd or Kim Buckner
NCI Information Systems, Inc.
Energy Science and Technology Software Center (ESTSC)
P.O. Box 1020
Oak Ridge, TN 37831

Phone: 865/576-1037
Fax: 865/576-6436
Email: estsc@adonis.osti.gov

Purchase DOE-2 Documentation

DOE-2 Sample Run Book (2.1E) -- The Sample Run book is the only DOE-2 manual not available electronically. It must be purchased separately from NTIS; ordering information may be found at http://SimulationResearch.lbl.gov > DOE-2 > Documentation

Free DOE-2 Documentation (http://simulationresearch.lbl.gov/> DOE-2 > Documentation)

DOE-2 Basics Manual (2.1E)

Update Packages: Update Packages are not cumulative; each one contains different information. Download all four packages then print and insert the pages into your existing DOE-2 manuals.

Update Package #1: DOE-2.1E Basics, the Supplement and BDL Summary
Update Package #2: BDL Summary and Supplement.
Update Package #3: Appendix A of the Supplement.
Update Package #4: (1000-zone DOE-2.1E) BDL Summary.

DOE-2 Modeling Tips (pdf files) for 2005 for 2004 for 2003 for 2002
A compilation of all the "how to" and "DOE-2 Puzzler" articles from the newsletter.

Changes and Bug Fixes to DOE-2.1E (txt file)
Description of all changes and bug fixes in a text document.

DOE-2 QuickQuestion

Q: In DOE-2, can external shading devices be modeled with a shading coefficient or a transmittance value, or are they always assumed to be opaque?

A: Yes, you may put a SHADING-SCHEDULE on an exterior shade to change its transmissivity as desired.

California Climate Zones on Google Earth™

Outlines of California's 16 Climate Zones have been overlaid on the aerial images of Google Earth. This is useful if you want to examine the boundary areas between two climate zones. The outlines are based on the GIS (Arcview) shapes. Google Earth is a free broadband, 3D application. Go to http://earth.google.com/ Once you download, install and launch the application, download and open the Climate Zones CA-CZ.kmz 120 kb file.

The free version does not allow labeling on the map, climate zones can be selectively viewed by using the check box along side each layer. We suggest that you uncheck all the climate zones and then select only the one of interest at the time to view.

Free Building Energy Software from Lawrence Berkeley National Laboratory

BDA 3.1 *(Building Design Advisor)* gaia.lbl.gov/BDA
(building decision-making from design through completion)

COMIS www-epb.lbl.gov/comis (multi-zone air flow and contaminant transport model)

EnergyPlus 1.2.3 www.energyplus.gov/
(next-generation whole-building energy analysis program, based on BLAST and DOE-2)

GenOpt® 2.0 SimulationResearch.lbl.gov (generic optimization program)

Optics 5.2 windows.lbl.gov/materials/optics5/
(for analyzing optical properties of glazing systems)

RADIANCE 3.5 radsite.lbl.gov/radiance/ (analysis and visualization of lighting in design)

- ***Desktop Radiance 2.0β*** radsite.lbl.gov/deskrad/
  (integrates the Radiance Synthetic Imaging System with AutoCAD Release 14)
- ***Radiance Control Panel*** www.squ1.com/site.html
  (automates some Radiance tasks once the model has been created)

THERM 5.2 windows.lbl.gov/software/therm/therm.html (models two-dimensional heat-transfer effects in building components where thermal bridges are of concern)

VisualSPARK 2.0 SimulationResearch.lbl.gov
(Simulation Problem Analysis and Research Kernel) (connect component models to simulate innovative building envelope and HVAC systems)

WINDOW 5.2 windows.lbl.gov/software/window/window.html
(thermal analysis of window products)

Free Software / Request by Fax from 510.486.4089

RESFEN 3.1 windows.lbl.gov/software/resfen/resfen.html
(choose energy-efficient, cost-effective windows for a given residential application)

Web Based

Home Energy Saver hes.lbl.gov (quickly computes home energy use)

IBPSA-USA -- SimBuild 2006 -- August 2-4, 2006

To be held at the Massachussets Institute of Technology in Cambridge, MA, USA
For details, access the website: http://ceae.colorado.edu/ibpsa/SimBuild06/index.html

IBPSA-USA will hold its second national conference, August 2-4, 2006 on the campus of the Massachusetts Institute of Technology. Technical sessions over two days will feature presentations on a wide range of topics related to the simulation of HVAC equipment, airflow in buildings, energy usage, and the visual and acoustic environment in buildings, as well as demonstrations of simulation software and of hardware and software needed to emulate or measure the performance of buildings. Friday will be a practitioner day, offering case studies, hands-on software demonstrations and other presentations aimed at giving practicing architects and engineers the information they need to be more informed collaborators with simulation experts. The practitioner day will be coordinated with local US Green Building Council chapters and affiliates.

Free Membership for 2006 -- IBPSA-USA

The IBPSA-USA Board of Directors has voted unanimously to extend our policy of free membership. Those interested in renewing their membership or becoming new members may do so by expressing their desire to be IBPSA-USA members and providing updated contact information
(Affiliation, Mailing address, Phone number, Email address)

Establishing membership may be done on-site at any IBPSA-USA meeting or by sending an email to the IBPSA-USA Secretary, Peter Ellis, at peter_ellis@nrel.gov.
[P] 303.384.7443, [F] 303.384.7540

Meetings, Conferences, Symposia and Workshops

2006		
April 19-21	National Conference on Building Commissioning	http://www.peci.org/.
April 23-27	Light+Building	www.light-building.messefrankfurt.com.
May 17–19	International Conference on Air Conditioning & Ventilation	www.acv2006.cz
May 21–24	5th International Conference HVAC+R Technologies	www.ttmd.org.tr
May 31– June 2	International Conference on Thermal Energy Storage	www.stockton.edu/ecostock

Building Energy Software Tools Directory

This directory provides information on over 300 building software tools for evaluating energy efficiency, renewable energy, and sustainability in buildings. The energy tools listed in this directory include databases, spreadsheets, component and systems analyses, and whole-building energy performance simulation programs. Know of a tool (yours?) that isn't in the directory? Send email to Dru Crawley at Drury.Crawley@ee.doe.gov.

Visit **http://www.eere.energy.gov/buildings/tools_directory/about.cfm**

April 2006 Educational Programs

Pacific Gas and Electric Company
WE DELIVER ENERGY.

For a complete listing of classes go to www.pge.com/pec

ARCHITECTURE

Apr 4	Cool Roofing - Materials, Benefits, and Title 24 Requirements
Apr 18	2005 Title 24 Nonresidential Building Envelope Requirements
Apr 26	What Factors Shape A Successful Daylighting System?

H V A C

Apr 6	Energy-Efficient HVAC Design and Control for High Density Data Centers

LIGHTING

Apr 20	A Light Affair IV (Evening Lecture)
Apr 26	What Factors Shape A Successful Daylighting System?

RENEWABLES

Apr 5	Understanding Financial Analysis Methods for Photovoltaic (PV) Systems
Apr 25	Combined Heat and Power Applications for Commercial Buildings

TITLE 24 (CALIFORNIA ENERGY CODE)

Apr 4	Cool Roofing - Materials, Benefits, and Title 24 Requirements
Apr 18	2005 Title 24 Nonresidential Building Envelope Requirements

From the Florida Solar Energy Center (FSEC)

Buildings Research Post Newsletter (Winter 2006)

Newsletter: http://www.fsec.ucf.edu/bldg/resources/newsletter/winter2006/index.htm

Evaluating Green Roof Energy Performance

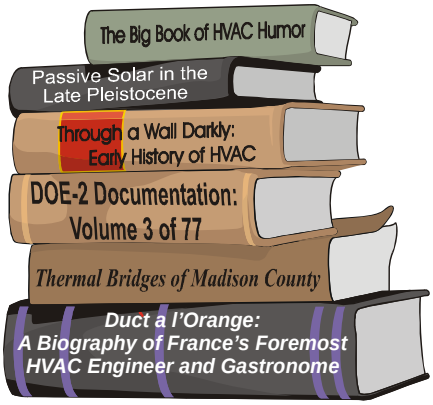
by

Jeff Sonne, Senior Research Engineer
Buildings Research Division
Florida Solar Energy Center
Cocoa FL

Abstract

Summertime data indicate significantly lower peak roof surface temperatures and higher nighttime surface temperatures for the green roof. The maximum average day temperature seen for the conventional roof surface was 130°F (54°C) while the maximum average day green roof surface temperature was 91°F (33°C), or 39°F (22°C) lower than the conventional roof.

Link to Report:
http://www.fsec.ucf.edu/bldg/resources/newsletter/winter2006/ASHRAE JeffSonne.pdf



* ***Free!*** The 2005 Buildings Energy Data Book includes statistics on residential and commercial building energy consumption. Data tables contain statistics related to construction, building technologies, energy consumption, and building characteristics.
Download book from:
http://buildingsdatabook.eere.energy.gov/

* ***Not Free!*** ASHRAE's "HVAC Simplified"
Explains fundamental HVAC concepts and simple design tools used to create building systems.
Cost is $79 ($59, ASHRAE members).
To order, go to http:// www.ashrae.org/

BLAST*news*

www.bso.uiuc.edu

Building Systems Laboratory
University of Illinois, 30 Mechanical Engineering Building,
1206 West Green Street, Urbana, IL 61801
Tel: (217) 333-3977 - Fax: (217) 244-6534
support@blast.bso.uiuc.edu

The Building Loads Analysis and System Thermodynamics (BLAST) program predicts energy consumption, energy system performance and cost for new or existing buildings.

BLAST contains three major sub-programs:

Space Load Prediction computes hourly space loads based on weather data and user inputs detailing the building construction and operation.

Air Distribution System Simulation uses the computed space loads, weather data, and user inputs.

Central Plant Simulation computes monthly and annual fuel and electrical power consumption.

Heat Balance Loads Calculator (HBLC) -- Graphical interface for producing BLAST input files.

WINLCCID 98 -- LCCID (Life Cycle Cost in Design) performs Life Cycle Cost Analyses.

Program Name and Description	Order Number	Price
PC BLAST Includes: BLAST, HBLC, BTEXT, WIFE, CHILLER, Report Writer, Report Writer File Generator, Comfort Report program, Weather File Reporting Program, Control Profile Macros for Lotus or Symphony, and the Design Week Program. The single CD-ROM includes s the BLAST Manual, technical articles and theses, nearly 400 processed weather files, browsing engine, source code.	3B486E3-0898	$1500
PC BLAST Package Upgrade from level 295+	4B486E3-0898	$450
WINLCCID 98: executable version for 386/486/Pentium	3LCC3-0898	$295
WINLCCID 98: update from WINLCCID 97	4LCC3-0898	$195

The last four digits of the catalog number indicate the month and year the item was released or published.

VisualDOE and LEED Training for 2006 Architectural Energy Corporation is pleased to announce three VisualDOE training sessions. In San Francisco on May 18-19, in Boulder, CO, on November 13-14 and sometime in July or August in New York. Each 2-day session focuses on DOE-2, the VisualDOE interface, VisualDOE 4 new features, general energy simulation skills, and LEED-NC 2.1 and 2.2 energy savings calculations for green buildings. To register or get more training information, please go to VisualDOE training page at http://www.archenergy.com/products/visualdoe/training/