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

Building Energy Simulation ◆ *User News*

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

Highlights

Regular Features

The 🐝 *Buzz*

EnergyPlus User Questionnaire

We invite all EnergyPlus users to participate in our survey. The questionnaire is on the Simulation Research Group's [website](#).

Here's the direct link: http://SimulationResearch.lbl.gov/surv07.html

We will be gathering data from June through September 2007.

In October we will draw the names/emails of five program users who completed the questionnaire; each one will receive a suitably "techie" prize!!

(We promise that the prize will NOT be a copy of the giant 6-ft long poster of 20th Century Buildings. ☺

Although . . . there are still a few copies available. Send email to (klellington@lbl.gov) to get a free poster!

PUB-439

Release of EnergyPlus 2.0

NEW FEATURES

DATA SETS

- New materials data set based on ASHRAE 2005 HOF (replaces legacy DOE-2 and BLAST data).
- Updated solar collector data set from the SRCC adds 55 more collectors for a total of 173.
- Added air change rate to ventilation loads report in StandardReports data set.

INPUT

- Objects and name lengths can now be 100 characters (previous limit was 60).
- New weather data for 86 locations added: 69 in Australia, 16 in Canada, and 1 in Iran.
- Three new unit ventilator input files created:
    - UnitVent5Zone.idf,
    - UnitVent5ZoneAuto.idf,
    - UnitVent5ZoneFixedOANoCoilOpt.idf.
- Three new thermal storage example input files created:
    - IceStorage-Parallel.idf,
    - IceStorage-Series-ChillerDownstream.idf,
    - IceStorage-Series-ChillerUpstream.idf.
- Example input files created for all new features (More than 225 example files now available)

GEOMETRY • WINDOW • WALLS • SHADING

- Shadowing Calculations object now allows user to specify maximum figures in shadowing overlaps.
- Phase change materials (PCM) with variable thermal conductivity and a temperature-enthalpy function incorporated in conduction finite difference solution algorithm.
- Basement program now outputs EnergyPlus IDF for wall and floor surface temperatures.
- Users can now enter interzone surfaces once and EnergyPlus will automatically create the mirror interzone surface.

DESIGN CALCULATIONS

- Zone Sizing modified to allow standards-type calculation of design outside air flow rates; allows minimum cooling and maximum heating limits on design supply air flow rates.

ON-SITE ENERGY SUPPLY

- Fuel cell model updated.
- Combustion micro cogeneration model added.

OUTPUT

- Report Variables and Meter Variables (rdd and mdd) separately reported and output as IDF.
- Meters can now report cumulative value in addition to resetting at reporting time interval.

Release of EnergyPlus 2.0

NATURAL AND MECHANICAL VENTILATION

- Zone forced air units added to reporting of mechanical ventilation rate and loads.
- Simple Ventilation object now reports air changes per hour.
- New options in UnitVentilator include no coil option and fixed amount for outside air control strategy.
- AirflowNetwork model can now use Zone Exhaust Fan, OnOff supply fan and the DX heating coil objects.

HVAC

- Water-to-air heat pumps now use RegulaFalsi solution technique to improve robustness and to speed up simulation.
- Applicability schedule added to System Availability Manager:Low Temperature Turn Off (to support thermal storage).
- Evaporative condenser option added to existing refrigerated case compressor racks including availability schedule and basin heater with controls.
- Draw-through fan configuration added for furnaces, unitary system and air-to-air heat pumps.
- Different supply air flow rates now allowed for cooling, heating and when no cooling or heating is required in unitary, furnace and air-to-air heat pumps.
- Common Pipe for Primary-Secondary systems provides an alternative to the Connection component object to model Primary-Secondary systems
- Balanced flow desiccant heat exchanger option added for the existing heat exchanger-assisted DX cooling coil object.
- Stratified water heater model added.
- Uniform load distribution option added to plant load range based operation scheme.
- Height-dependent air temperature and wind speed now available for most HVAC systems.

UTILITIES

- New EP-Launch utility tab added where users can launch Basement, CalcSoilSurfTemp, CoeffCheck, CoeffConv, Slab and Weather utilities.
- CSVproc now supported in EP-Launch.
- IDF Editor now preserves the order of user IDFs and includes a large number of other new features.

WATER MANAGER

- Green roof simulation added.

DOCUMENTATION AND GUIDES

- Input/Output Reference and Engineering Reference updated and extended for all new features and updates. Total documentation now exceeds 3300 pages.

EnergyPlus Now Available for Apple's Intel-based Macintosh Platform

The newest version of EnergyPlus (2.0), released on April 12, 2007, is also available today for Apple's Intel-based Macintosh platform (in addition to Windows and Linux versions). Key new features in V 2.0 include green roofs, phase-change materials, and enhanced building controls. Download at no cost from the EnergyPlus web site: http://www.energyplus.gov.

Our thanks to Greg Stark of Building Synergies, LLC for his help in porting EnergyPlus to the Apple Macintosh platform.

Status of EnergyPlus Plug-In for SketchUp

DOE plans to release an EnergyPlus plug-in for Google's SketchUp later in 2007. This free EnergyPlus plug-in will integrate building simulation functionality into the SketchUp drawing environment. The plug-in stores EnergyPlus input data on SketchUp surfaces as they are drawn by the user. An EnergyPlus toolbar provides a way to create zones and surfaces with only a few mouse clicks. Construction assignments are 'painted' onto surfaces using a palette of EnergyPlus wall, roof, and window constructions. Users will be able to execute an annual simulation from within SketchUp. Watch the EnergyPlus web site http://www.energyplus.gov and email for more information.

EnergyPlus_Support Group at YahooGroups

Are you a commercial or academic user of EnergyPlus? Join more than 1200 EnergyPlus users in an email group on YahooGroups. It's a place to ask your questions and share information with other users. The YahooGroup provides a searchable archive of all 6 years of discussion. You can also upload files to share with other users. This group supplements but does not replace the primary support email address of EnergyPlus-Support@gard.com.

The main web page for the group is: http://groups.yahoo.com/group/EnergyPlus_Support

To subscribe, send an email message to: EnergyPlus_Support-subscribe@yahoogroups.com

---

* * * ENERGYPLUS SURVEY/USER QUESTIONNAIRE * * *
The EnergyPlus Development Team would like your input. We need to know who you are and how you use EnergyPlus. This is your chance to help guide the future development of EnergyPlus.
User Questionnaire.

Ask an EnergyPlus Expert . . .

SENSIBLE HEATING AND COOLING RATE FOR ONE ZONE.

From the results of one of my simulations, I found that during some time steps for one zone the sensible heating and sensible cooling rate were both greater than zero. Can you help me understand this?

Answer

It is most unlikely that this would happen during "detailed" reporting; however, it is quite likely during time step (i.e. Zone Time Step) or hourly reporting. The HVAC time step automatically reduces itself below the zone time step to get to convergence. Read about the Time Step in Hour and System Convergence limits as well as searching the documentation for "time step (timestep)."

GROUND TEMPERATURES AND THE SLAB PROGRAM

My question is about calculating ground temperatures. After I reviewed the Auxiliary Programs documentation, I tried to calculate ground temperatures, but when I ran the slab program, I got error messages.

Answer

The Slab program needs its own IDF file, written to the specifications shown in the Auxiliary Programs document. From the example you submitted, it would appear that you pointed the IDF file at an EnergyPlus IDF file instead. SlabExample.idf in the Ground Temp Folder should give you a good starting point.

INCREASING HEAT TRANSFER WITH INDUCED TURBULENCE

I added ribs to the surface of a wall in order to induce turbulence. Do you have any ideas about how to model the changes to heat transfer to walls, etc.?

Answer

It all comes down to convection coefficients. In EnergyPlus, you can report convection coefficients (Surface Int Convection Coeff and Surface Ext Convection Coeff) and you can control them with the ConvectionCoefficients object or by simply changing the Roughness field in the outside material layer. So, even without knowing the real relationship between ribs and heat transfer, you could get an idea of the potential impact of, say, a 10-fold increase in convection coefficients.

INSIDE CONVECTION COEFFICIENT

I would like to define my own values of inside convection coefficients in the Energyplus idf file. How?

Answer

Look at example file 5ZoneAirCooledConvCoef.idf and the "ConvectionCoefficients" object. Also, look in the Input/Output Reference for the same object and the ConvectionCoefficients:MultipleSurface object descriptions. These will allow you to change convection coefficients for one or many surfaces in your file.

Ask an EnergyPlus Expert . . .

THERMAL COMFORT AND THERMOSTATIC

I need to control Thermal Comfort during office hours and then switch over to Thermostatic control during non-office hours (page 847 / pdf 855) of the Input/Output Reference Manual.
This is the error I'm getting:

```
** Severe ** GetZoneAirSetpoints:
** Could not find Dual Thermal Comfort Setpoint with Deadband
** Schedule:Fanger=TEST
```

TEST is the name I gave to Thermal Comfort Control Type Name #1 in the Zone Control:Thermal Comfort object. Do I enter TEST in the Setpoint Manager? I already have a Schedule type (PMV, range -4:4, Continuous Numeric) DaySchedule (Thermal Comfort Day, PMV, with hourly values of 4 and 0) WeekSchedule (Thermal Comfort Week, Thermal Comfort Day for all fields Schedule (Thermal Comfort, PMV, Thermal Comfort Week, 1/1 to 12/31)?

Answer
The reason you got the error is that you don't have an object of Dual Thermal Comfort Setpoint with Deadband:Fanger with object name = Test. After defining the object, you may need two setpoint PMV schedules. The schedule you mentioned looks like thermal comfort type schedule, which allows you to change comfort type every time step. Please look at an example file of FurnaceWithDXSystemComfortControl.idf, which may give you a good starting point.

```
!- ========== ALL OBJECTS IN CLASS: DUAL THERMAL COMFORT SETPOINT WITH
DEADBAND:FANGER ==========
DUAL THERMAL COMFORT SETPOINT WITH DEADBAND:FANGER,
Test, !- Name
Heating PMV Setpoints, !- Fanger Thermal Comfort Heating Setpoint PMV
SCHEDULE Name
Cooling PMV Setpoints; !- Fanger Thermal Comfort Cooling Setpoint PMV
SCHEDULE Name
```

SUPPLY FAN VARIABLES

I am doing a building simulation in which compact HVAC is used. In the field for supply fan operation mode I have chosen cycling (not continuous). How do I find the power consumed by the supply fan separately (cooling and/or heating)?

Answer
Use the Fan Electric Power and Fan Electric Consumption report variables. These variables are described in the Input/Output Reference document for the Fan:Simple:OnOff object. If you want to know how much fan energy is consumed in cooling mode and how much fan energy is consumed in heating mode, then you will have to use a spreadsheet to perform the calculations. Report the fan cooling and heating energy. Then in the spreadsheet, sum the fan energy when cooling energy is greater than 0. Do the same for the fan when heating energy is greater than 0.

FSEC Researcher Writes Book on Solar Photovoltaic Systems

Jim Dunlop, a researcher at the Florida Solar Energy Center (FSEC), has written "Photovoltaic Systems," a comprehensive guide to the fundamentals, design and installation of photovoltaic (PV) systems. The book covers all system components and configurations in detail, with chapters on principles of solar energy, batteries, utility interconnection, economic analysis and related topics. Included with the book is a CD-ROM containing video clips, solar radiation data, and worksheets and checklists for class use.
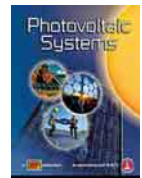
Ask an EnergyPlus Expert . . .

ZONE CONTROLS AND THERMOSTATS

I want to calculate "zone sensible load predicted," "zone sensible load to heating setpoint predicted," and "zone sensible load to cooling setpoint predicted" against the setpoint. I entered a value in the "zone controls and thermostats" object but the resulting value was different from the "input/output reference" statement. The "Zone sensible load predicted" results are all 0, "zone sensible load to heating setpoint predicted" results are all negative values, and "zone sensible load to cooling setpoint predicted" results are all positive values.

Answer
Zone sensible load predicted gives you the thermostat load. If it is zero, there is no load. The zone temperature is below the cooling setpoint and/or above the heating setpoint. This is the theromostat dead band region. The zone sensible load to heating setpoint predicted is negative because the zone temperature is above the heating setpoint. The zone sensible load to cooling setpoint predicted is positive because the zone temperature is below the cooling setpoint.

Change your thermostat setpoints and you will see that when there is a cooling load, the zone sensible load to cooling setpoint predicted will go negative when the zone temperature is above the cooling setpoint. And when there is a heating load, the zone sensible load to heating setpoint will go positive when the zone temperature is below the heating setpoint. The zone sensible load predicted should also show these same results.

If your thermostat setpoints are correct, you will have to change the zone loads. More outside air will likely cause a load in the zone for both winter and summer. Or adding equipment/lighting loads will cause a cooling load in summer (and possibly winter).

EVAPCOOLER RDD SPECIAL COOLER

I am using the RDDSpecial object to simulate an indirect evaporative cooler where the secondary air is building exhaust air. I want the object to behave like a wet coil indirect evaporative cooler. However, I can't figure out what the inputs for the object should be to make it behave like a wet coil, as opposed to a regular indirect pad cooler. I know there is an example file, but I don't know what type of cooler is in the example file. What should I input for the "Cooler Maximum Effectiveness"? What about the "Dewpoint Effectiveness Factor"?

Answer
The RDDspecial model is fairly generic and can represent any type of indirect cooler with a constant wetbulb effectiveness. The words "*effectiveness*" and "*efficiency*" are somewhat interchangeable here. The value for "cooler maximum effectiveness" would be the same as what you use for "coil maximum efficiency" in the input for EvapCooler:InDirect:WetCoil. The Dewpoint effectiveness factor can be set to 1.0 -- it only comes into play for wetbulb effectiveness values well over 1.0 (as for M-cycle coolers).

FLOOR GEOMETRY

I have an L-shaped floor that shows up as a "polyline" with some thickness in DXF if I enter the 6 coordinates in one surface object. However, if I enter it as 2 rectangular surfaces they show up as 2 "surfaces" in the DXF file. Does the DXF rendering give any indication of how the surface is treated by EnergyPlus for load calculations?

Answer
Polyline/thick line is the default for a greater-than-4 sided surface representation in the DXF file. You can also choose to have the program "triangulate" that greater-than-4 sided surface for better pictures. But the inside representation/calculation has nothing to do with the DXF view.

Ask an EnergyPlus Expert . . .

HEAT PUMP DATA

I am simulating a room with a unitary heat pump, wherein I am trying to define the cooling and heating powers -- but don´t know where to define them!

For example:

    Cooling power=3500W
    Heating power=3700W
    Absorbed power during the maximum performance=1090W.

Answer

Look in the Input/ Output Reference document (pdf) and search for "UnitarySystem:HeatPump:AirToAir". For this system, you need to define an associated direct expansion (DX) cooling coil [Coil:DX:CoolingBypassFactorEmpirical or Coil:DX:CoolingHeatExchanger Assisted] and a DX heating coil [Coil:DX:HeatingEmpirical]. The performance of the cooling and heating coils is defined in these coil objects.
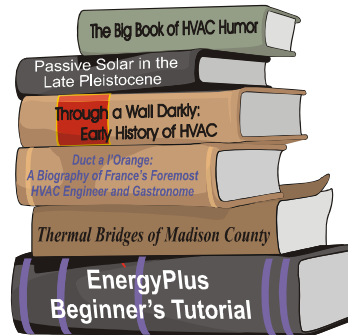

A Getting Started Tutorial for EnergyPlus

by Vishal Garg
Center for IT in Building Science
IIIT Hyderabad India

Dr. Vishal Garg has created an EnergyPlus tutorial aimed at architects and engineers who are familiar with the basic concepts of energy simulation and HVAC systems.

The tutorial outlines the procedures for modeling a small room using EnergyPlus, how to run the simulation and how to read the output files.

The output presents both heating and cooling energy consumption; th euser may then experiment with size, orientation, material properties, location, etc., and compare heating and cooling energy consumption.

The Big Book of HVAC Humor

Passive Solar in the Late Pleistocene

Through a Wall Darkly: Early History of HVAC

Duct a l'Orange: A Biography of France's Foremost HVAC Engineer and Gastronome

Thermal Bridges of Madison County

EnergyPlus Beginner's Tutorial

The tutorial uses a simple building example to explain the basics of how to use EnergyPlus, provides input examples and shows a new user how to read the output. The emphasis is on a very simple model without HVAC or plant. The user will learn how to enter the material, construction and geometry of a simple building.

The tutorial is a work-in-progress and is often updated to reflect changes in the software. Please contact Dr. Garg for further information.

http://energyplustutorial.googlepages.com/

Meetings - Conferences - Symposia

2007		
Sept 03-06	Building Simulation 2007 Beijing, China	http://www.bs2007.org.cn
Oct 28-31	Int'l Conference on IAQ, Ventilation and Energy Conservation in Buildings	yoshino@sabine.pln.archi.tohoku.ac.jp.
Nov 16	IBPSA-England Symposium	http://www.ibpsa-england.org/
Dec 11	FEDcon (Washington, D.C.)	http://www.nibs.org/fedcon.html

Ask an EnergyPlus Expert . . .

RESIDENTIAL HEATER SIZING AND CYCLING TIME STEP

I need to model a standard constant volume residential forced-air heater in EnergyPlus and see the impact of Sizing on efficiency and heater cycling. However, I haven't been able to figure out how to model the heater appropriately to make sure that it has a sufficiently small time step resolution so it can cycle and the difference in efficiency can be noted. My understanding is that the HVAC system time step is decoupled from the 15 minute building time step, allowing it to free-run with an adaptive time step (down to seconds if need be). Is this true? And, if not, is there anything that needs to be done to enable this behavior? Is there any way to see the high-res HVAC transients in the output?

Also, what is the best way to get a constant volume, constant BTU heater to model residential forced air systems?

Answer
You might want to have a look at the example file: FurnacePLRHeatingCoil.idf; it uses a Furnace:BlowThrough:HeatOnly system, which uses a gas heating coil (Coil:Gas:Heating).

By default, the HVAC time step is automatically reduced below the building (zone) time step as needed, down to a minimum of 1 minute if needed (not seconds).

See the 'Time Step In Hour' and 'System Convergence Limits' objects in the Input/Output Reference to understand the details.

COOLING COIL ERROR

I am getting the following error on a coil:water:cooling

```
** Warning ** SizeWaterCoil: Coil="EXTERIOR ZONES COOLING COIL",
** Cooling Coil has leaving humidity ratio > entering humidity ratio.
**.will be sized for 50% of entering humidity ratio.
** Warning ** SizeWaterCoil: Coil="EXTERIOR ZONES COOLING COIL",
** Cooling Coil has part wet, part dry conditions.
** will be sized for 50% of design entering humidity ratio.
** Warning ** SizeWaterCoil: Coil="OPERATING ZONE COOLING COIL",
** Cooling Coil has leaving humidity ratio > entering humidity ratio.
** will be sized for 50% of entering humidity ratio.
** Warning ** SizeWaterCoil: Coil="OPERATING ZONE COOLING COIL",
** Cooling Coil has part wet, part dry conditions.
** will be sized for 50% of design entering humidity ratio.
```

I don't understand what the error means. In terms of the leaving humidity ratio, are we talking about the system design humidity ratio? This error is destroying the performance of the cooling coil.

Answer
This is coming from the coil autosizing calculation. The coil entering conditions are the mixed air conditions: recirculated air (if any) mixed with outside air. The outlet conditions are what you told the program in your System Sizing input as your desired design cooling supply air conditions. So the message is saying that the entering moisture content is less than the leaving moisture content. Since a coil can't add moisture, the choice is made to try to remove half of the entering moisture.

---

* * * ENERGYPLUS SURVEY/USER QUESTIONNAIRE * * *
The EnergyPlus Development Team would like your input. We need to know who you are and how you use EnergyPlus. This is your chance to help guide the future development of EnergyPlus. User Questionnaire.

Ask an EnergyPlus Expert . . .

HEATER ELEMENT EXPONENT

I need to model a simple heating system, including boiler, pump and radiator (baseboard). However, I didn't find an option to enter the heater element exponent (emission index) in the Baseboard Heater:Water:Convective object. How do I represent the non-linear properties of a radiator?

Answer
The baseboard heater in EnergyPlus, BASEBOARD HEATER:WATER:CONVECTIVE, is 100% convective. The equation in the Input/Output Reference, which defines the heat output as a function of UA, is incorrect. And, unfortunately, there is no section in the Engineering Reference for this model. The revised description for the UA field follows:

Field: UA
The overall heat transfer coefficient for the baseboard heater in watts per degree
Celsius at design conditions. The UA is used in an NTU -- effectiveness calculation.
An estimate of the UA can be obtained from:

$$q = UA \times (Twater,avg - Tair,avg)$$

where q is the heat transferred from water to the air in watts; Twater,avg is the average water temperature in °C; and Tair,avg is the average air temperature in °C. Or the LMTD temperature difference can be used.

So, for convective heat transfer, the non-linear output of the heater as a function of water and air temperature should be accounted for by the model. But there is no radiant component, so that effect is lost. For the Fall 2007 release, there will be a new radiator model, which will be a combined convection-radiation model.

Currently, a true radiator can be approximated by using LOW TEMP RADIANT SYSTEM:HYDRONIC on a small surface.

ZERO AIR LOOP MASS FLOW RATE

I'm simulating a one-zone model to get familiar with Energy Plus. I constructed a simple Air Loop. The primary air system side contains Fan and coil:water:simple:heating elements, the zone equipment side contains a single duct:vav:noreheat element. I compared my file several times with example files, but I have still no mass flow rate in the Air Loop. I don't get any warnings, thus it seems to be a set point or controller fault.

Answer
In the BRANCH object "Branch_Air_supply_in" the maximum flow rate is set to zero (Version 2.0 generates a warning message for this condition, so you should upgrade). When specifying hard values for sizes (instead of autosize), the maximum (or design) flow rate in the AIR PRIMARY LOOP, BRANCH, FAN, and other components on the air loop main branch must all have the same value. And the sum of the terminal unit design flow rates must equal the main air loop flow rate.

TO THE MAN HOLDING A HAMMER, EVERYTHING LOOKS LIKE A NAIL

Ask an EnergyPlus Expert . . .

WET BULB TEMPERATURE INCONSISTENCY

I noticed a difference in the wet bulb temperature in the eso file output, when compared to the wet bulb temperature found in the .epw file.

Answer
First, note that the epw file does not have a wet bulb temperature, it has a dew point temperature.

There is also the issue of interpolation. Perhaps if you ran Time Step in Hour = 1, you would see the temperatures exactly as they are on the epw file (hourly). At other time step frequencies, they are interpolated between the time steps to make a continuous progression.

CFM/TON LIMITS

I am having a problem getting PTAC cooling coils to size correctly. The coil cooling capacities are sizing smaller than they should (considerably smaller, by a factor of almost 6). The eio file reports that the coils are sizing right up at the limit of 450 cfm/ton (6.04E-05 m^3/W). I am interpreting this to mean that the low tonnage is correspondingly limiting the air flow. However, I need more tonnage to supply zone temperatures. Why is the sizing routing limiting my tonnage? And how do I move them from this limit? The PTAC air flows are all autosized. My zone sizing design cooling temperature is 14C, which I believe to be fairly reasonable.

Answer
The air flow is calculated first and is fundamental; it is not altered. The cooling capacity is then calculated and is limited by 450 cfm/ton. The cooling flow rate is basically established by the zone design sensible cooling load, which is set by your design day weather, internal loads, outside air requirements, window-and-wall heat gains, etc. So, if you are seeing an error by a factor of 6, the questions would be these:

1. Are your design calculation inputs correct (does the design flow rate seem reasonable)?
2. Do you have a huge latent load (from internal sources or outside air)?

Building Energy Events from the Pacific Energy Center, San Francisco

Incentive Programs
Sep 08	Solar Power Basics for Residential Customers
Oct 13	Solar Power Basics for Residential Customers

Marketing + Finance
Sep 17	BOMA BEEP Seminar 5: Valuing Energy Enhancement Projects and Financial Returns
Sep 17	BOMA BEEP Seminar 5: Valuing Energy Enhancement Projects and Financial Returns - An Online Course
Oct 15	BOMA BEEP Seminar 6: Building an Energy Awareness Program - An Online Course

Renewables
Aug 11	Solar Power Basics for Residential Customers
Sep 08	Solar Power Basics for Residential Customers
Oct 13	Solar Power Basics for Residential Customers

Ask an EnergyPlus Expert . . .

DAY-OF-THE-WEEK START DAY

For the RUNPERIOD, what determines the "Day-of-the-Week start day"? Is this day determined from the weather file, or can the day be chosen as I desire?

Answer
In general, the weather files used for energy analysis do not represent actual "years." If you look at some of the EPW files, you will see the actual years that were used to make up the data listed. Usually a month will have the same year but the next month may not.

The EPW file designates a start day of week for the weather file (ref: Data Period line). For flexibility, the RunPeriod field allows you to change that. And you can choose a week day for any subset run period you might select out of the weather file. Day of Week is primarily used for scheduled values, set points, etc.

As noted in the Input Output Reference:

> *Field: Day Of Week For Start Day*
> *For flexibility, the day of week indicated on the weather file can be overridden by this field's value. Valid days of the week (Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday) must be entered in this field.*

WARNINGS

During my simulation, I got this warning:

```
** Warning ** COIL:DX:COOLINGBYPASSFACTOREMPIRICAL "SOUTH_2_SYSTEM COOLING
COIL" - Air-cooled condenser inlet dry-bulb temperature below 0 C. Outdoor
dry-bulb temperature = -0.35
```

But there was no severe error. My two questions are:
1. Can I believe the results with this kind of warning?
2. What causes the program to issue such a warning and what does the warning mean?

Answer
Question 1:
You can verify if the warning is correct by looking at the Environment:Outdoor Dry Bulb and DX Coil Total Cooling Rate report variables. For the time that you see the warning, check that the DX coil is operating and verify that the outdoor dry-bulb temperature is above 0C. When the outdoor dry-bulb temperature is below 0C and the DX coil is operating, you will see this warning. If this warning is false, try downloading the new version of EnergyPlus 2.0, there was some work performed to make warnings more readable and reliable with 2.0.

Question 2:
EnergyPlus gives warnings to help the user perform simulations. Whether to help with setting up the input file with equipment node connections, or to warn the user that performance issues exist with the equipment selected for the simulation. This particular warning tells you that DX cooling equipment should not be operated at very cold outdoor dry-bulb temperatures. This type of operation can damage the equipment due to poor oil circulation. Although you cannot damage a DX compressor in a simulation, you can damage it in real life and this warning is meant to help you select the appropriate type of equipment for your application. Cooling is not typically required when the outdoor temperatures are very cold. If cooling is required when outdoor temperatures are very low, maybe a hydronic system would be better served in your climate.

The Solar Shoe Box, a Simple-to-Use Interface for EnergyPlus

The Solar Shoe Box creates a rectangular model (shoe box) of a direct gain passive solar building.

The precursor to The Solar Shoe Box was a program called FreeRunner, which was written to show how different variables affect the indoor temperature of a building. The user interface is similar to an equalizer, wherein the user "fine tunes" the indoor temperature level and temperature swings by using sliders to increase or decrease the variable.

ArchiPhysics *

SolarShoeBox (basically a graphical text editor) has a OpenGL modeler and interfaces with EnergyPlus.

SolarShoeBox runs on both Windows and Macintosh (Universal). If you do not yet have the Mac version of EnergyPlus, SolarShoe Box will create an IDF that you can transfer to Windows to run in EnergyPlus.

If you download and use the program, please send your comments to troy@archiphysics.com

It's not Rocket Science . . . It's Building Science

* *Troy N. Peters (AIA, LEED AP) is an architect living near Chicago, IL. He has created ArchiPhysics, a site that enables people to share research and teaching aids he has developed. The software on ArchiPhysics is free for the download. The EnergyPlus Development Team would like to thank Troy for allowing us to include his SolarShoe Box with other EnergyPlus-related software.*

New Software From NRC-CNRC – The Institute For Research In Construction

Daylight 1-2-3

Daylight 1-2-3 (formerly known as the Lightswitch Wizard) is a non-expert design analysis tool that supports daylighting-related design decisions in commercial buildings during the initial design and design development stages. It predicts the daylighting and energy performance of side- and top-lit offices and classrooms.

The software was developed to help design professionals develop climate-responsive daylighting design concepts, optimize façade and roof layout and orientation with respect to daylight and energy use, and to quantify energy savings from occupancy sensors or photocell controlled dimming.

You can download the (WINDOWS only) software free-of-charge from www.daylight1-2-3.com.

WikiPedia for Building Simulation

What do you get when you combine *Building Simulation* with a *WikiPedia*?? You get *Simupedia* -- a user-driven encyclopedia aimed at building simulation practitioners!! The idea originated with IBPSA-Germany and it is hoped that Simupedia will become a world-wide effort. Add to it at http://129.187.44.165/index.php/Simupedia/en .

IBPSA-Germany

Simupedia
Simulationsratgeber Bauwesen

SEPTEMBER 2007 TECHNICAL SEMINARS

Presented by Southern California Gas Company
Located at the Energy Resource Center in Downey, California
http://www.socalgas.com/business/resource_center/erc_home.shtml

September 11	EnergyPro Training: Indoor & Outdoor Lighting
September 11	EnergyPro Training: Envelope and Windows
September 12	EnergyPro Training: Advanced
September 12	EnergyPro Training: Mechanical
September 13	Saving Energy with Combined Heat and Power
September 13	2008 Non-Residential Title 24 Standards: Compliance, TDV & Beyond
September 27	Boiler Basics-Energy Resource Center

Southern California Gas Company

I • B • P • S • A

Free Membership:
Did you know that membership in many of the IBPSA affiliates is now free of charge? Australasia, Canada, China, the Czech Republic, Germany, Switzerland and the U.S. all offer free membership. Links to the affiliates are listed on the Simulation Research Group's *Big List of Free* (http://SimulationResearch.lbl.gov/dirsoft/free.html) or you can go directly to the Affiliates page at IBPSA (http://www.ibpsa.org/m_affiliates.asp).

BS2007

The 10th International Building Performance Simulation Association Conference and Exhibition will be held in Beijing in September 2007. Architects, designers, researchers, environmental engineers, city planners, simulation software producers, and all academics, professionals and practitioners involved with building performance simulation from all over the world will attend this conference to exchange the latest knowledge and experience.

EnergyPlus Workshop
Will be held on August 31-September 1, 2007 before BS2007 Conference. The objective of this workshop is to introduce EnergyPlus to modelers who are familiar with the basic concepts of HVAC systems and energy simulation.

Fall & Winter Classes and Workshops from the

Sacramento Municipal Utility District

Oct 11	Evaporative Technologies
Oct 30	Introduction to Photovoltaics for Contractors
Nov 02	Lighting for Historic Places
Dec 12	Top 10 Commissioning Issues

SMUD Energy & Technology Center   http://www.smud.org/education/index.html
6301 "S" Street
Sacramento, California

Please visit our website at http://SimulationResearch.lbl.gov

EnergyPlus Version 2.0

Support Tools

Support software is listed on the main EnergyPlus website.

Weather Data

Main weather data site is at
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

Ask an EnergyPlus Expert

Questions from program users are answered promptly via the EnergyPlus User Group at
Yahoo. To join, go to http://groups.yahoo.com/group/EnergyPlus_Support/
Selected questions and answers have been compiled into PDF documents:
for 2002, for 2003, for 2004, for 2005, for 2006

Are you an EnergyPlus consultant?

If you are an EnergyPlus consultant and would like to be listed in this newsletter and on our
website, please send details to klellington@lbl.gov

Testing and Validation

Go to http://www.eere.energy.gov/buildings/energyplus/testing.html   for info.

*EnergyPlus is being developed by University of Illinois and Lawrence Berkeley National Laboratory, 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).*

DOE-2.1E, Version 124

Are you a DOE-2 Consultant?

If you would like to be listed as a DOE-2 consultant on our website and in the monthly *User
News* Newsletter, please contact klellington@lbl.gov

Get Free DOE-2 Documentation. Download from http://SimulationResearch.lbl.gov/

DOE-2 Basics Manual (2.1E) http://gundog.lbl.gov/dirpubs/BASIC/basiclist.html

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 2006 2005 2004 2003 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)
http://simulationresearch.lbl.gov/dirpubs/VERSIONS.txt
All changes and bug fixes in a plain-text document.