EnergyPlus*SPARK*DOE-2* EnergyPlus*VisualSPARK*DOE-2*GenOpt*EnergyPlus*DOE-2*GenOpt*EnergyPlus*
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Building Energy Simulation ◆ *User News*

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Highlights

Technical Report

Regular Features

The 🐝 *Buzz*

EnergyPlus Survey
The EnergyPlus Development Team would like to thank everyone who participated in the Survey.

Also, as promised, we drew five names at random from responders' email addresses; each prize-winner received a memory card or flash drive. Congratulations!

Call for Abstracts
The SimBuild 2008 Conference will be held July 30 to August 01 (2008) in Berkeley, CA, on the campus of the University of California. Details are at http://gaia.lbl.gov/ocs/index.php/simbuild/2008

Ask an EnergyPlus Expert . . .

ECONOMICS AND DEMAND COST CALCULATIONS

I need to figure out what portion of the utility bill is due to lighting, HVAC, process, etc. The billing is simple: demand and consumption charges. Since demand charges are by far the largest part of the bill, I wanted an easy way to split these charges among the various services. I'm not sure EnergyPlus can do this.

Answer
These calculations are not yet supported inside EnergyPlus; you would have to do them with postprocessing. However, a formal methodology for splitting demand charges across end uses was prepared as part of the commercial building tax credits. See section 3.1 of the report at:

http://www.nrel.gov/docs/fy07osti/40228.pdf

**Energy Savings Modeling and Inspection Guidelines for
Commercial Building Federal Tax Deductions (NREL/TP-550-40228)**

M. Deru
National Renewable Energy Laboratory
1617 Cole Boulevard
Golden, CO 80401-3393

February 2007

Introduction
This document provides guidance for modeling and inspecting energy-efficient property in commercial buildings for certification of the energy and power cost savings related to § 179D of the Internal Revenue Code (IRC) enacted in § 1331 of the 2005 Energy Policy Act (EPAct 2005) and noted in Internal Revenue Service (IRS) Notice 2006-52. Specifically, § 179D provides federal tax deductions for energy-efficient property related to a commercial building's envelope; interior lighting; heating, ventilating, and air conditioning (HVAC); and service hot water (SHW) systems.

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Ask an EnergyPlus Expert . . .

LATENT LOADS AND PURCHASED AIR

Does the purchased air simulation calculate the latent cooling loads?

Answer
Purchased Air is always supplied to the zone at the user-specified temperature and humidity condition. All moisture balances in the zone are included in the simulation, including the impact of infiltration and internal latent gains. However, Purchased Air does not actively control the zone humidity to a specific level.

Purchased Air Total Cooling Energy (or Rate) reports the latent and sensible energy required to bring the return air (plus outside air if specified) to the specified supply air temperature and humidity ratio.

Purchased Air Sensible Cooling Energy and Purchased Air Heating Energy report sensible energy only.

For definitions of Purchased Air report variables, please see the Input/Output Reference, p. 716 (pdf p. 755). For the equations used in Purchased Air, please see the Engineering Reference, p. 631 (pdf p. 667).

PURCHASED AIR HEATING AND COOLING

I'm trying to understand purchased cooling and heating. I simulated the model in PurchAirTables.idf and got Zone/Sys Sensible Heating Rate and Purchased Air Sensible Cooling Rate; however, there were different values for the same zone. Why?

Answer
These two values should be identical, and they are for most hours. However, after reviewing your file, there appears to be a slight difference in the first hour in the morning during recovery from setback. We will check on this.

Please bear in mind that the concept of Purchased Air was supposed to provide a simple way to calculate loads without simulating a full HVAC system. Purchased Chilled Water or Hot Water is commonly available from urban district heating and cooling systems. Purchased Air is analagous to this but delivered directly to the zone with no air handling system in the model. Purchased Air would not ever exist in the real world, but it is a convenient simulation concept.

PURCHASED COOLING VS FAN COIL COOLING

I'm getting results of Purchased Cooling being lower than the sum of the fan coil cooling rates.

Answer
"Fan Coil Total Cooling Rate" is the net cooling provided to the zone, including free cooling from outside air delivered by the fan coil unit. It is not the chilled water demand from the fan coil unit. For that, you would need to report "Total Water Cooling Coil Rate" or "Water Cooling Coil Chilled Water Consumption". Most report variables are defined in the Input/Output Reference. Search for the report variable name.

Ask an EnergyPlus Expert . . .

HOW TO CHANGE THE DEFAULT OUTPUT UNITS

In the report meter file, the unit of value in plant, facility, Building, etc., is kJ. I want to know the value-kw of system component electricity consumption. How do I get the value (kw unit)

Answer
The default output units for EnergyPlus energy meters is [J] (not kJ). For REPORT METER output, you can use the convertESOMTR utility to convert values to different units. See "convertESOMTR" in the Auxliliary Programs document. The default convert.txt file contains many active conversions to convert from SI to IP units. You can create your own convert.txt file which only converts electric meters to kWh.

EQUIPMENT SCHEDULING

I am modeling a building with an HVAC system that turns off during hours of non-occupancy. I have noticed, according to the ESO, that on most mornings the zones need to be cooled before occupancy. The HVAC system turns on one hour before occupancy and is very good at bringing the space to temperature before occupants arrive; however, it has a difficult time maintaining temperature during occupancy. I don't know the cause, unless I don't have the equipment scheduled during my design day sizing routines and this is affecting my cooling coil sizing.

Answer
As you suggest, internal gains, plus outside air, must be at expected peak levels during the cooling design day(s) in order to adequately size the coils. One quick check is to change the day type on your cooling design day(s) to be a Monday and see if this helps the situation. Also check that the supply air temperature controls are consistent with the temperatures in the zone and system sizing objects. And remember that fan heat is neglected in the current sizing algorithm. This can be allowed for by setting the SYSTEM SIZING cooling supply temperature a few degrees (equal to the supply fan temperature rise) lower than the ZONE SIZING cooling supply temperature.

COOLING SIMULATION

I'm simulating an 18-story building served by Desiccant CV. I've checked (and re-checked) the objects, fields, input values, nodes, node connections, etc., and everything seems to be okay. However, cooling isn't operating. The indoor radiant temperature is 40~50C. In the Report meter, the value of Cooling:electricity is 0 so cooling isn't operating.

Answer
The cooling is operating. See PurchasedCooling:Facility. Because the chilled water loop is served by PURCHASED:CHILLED WATER, there will be no Cooling:Electricity consumption. Some cooling is occurring but it is not enough. Report the chilled water outlet temperature. If this is not meeting setpoint, then the amount of purchased chilled water is too small. If the chilled water setpoint is being met, report the air temperature at the air loop outlet. If this is not meeting the setpoint, then the chilled water coil may not be large enough. If the air temperature is OK, then the airflows to the zones may not be large enough.

Ask an EnergyPlus Expert . . .

WORLD COORDINATE SYSTEM

I received this warning message:

```
** Warning ** World Coordinate System selected.
** Any non-zero Building/Zone North Axes or non-zero Zone Origins
** are ignored. These will be used in Daylighting:Detailed
** calculations but not in normal geometry inputs."
```

In my simulation result, all daylighting reference points were outside the zone range to which they belonged. What does the word "ignored" mean in the context of the error message and how does it influence the simulation process?

Answer
Daylighting coordinates are always put in relative to zone origin coordinates. If you put in non-zero building/zone north axes or non-zero Zone Origins, then the Daylighting coordinates must be relative to them. If you put in your daylighting coordinates in world coordinates, they will likely be outside your zone boundaries and you will have problems.

If this is really the case, then you can set your north axis values (both Building and Zone) to 0 as well as the Zone Origin (X,Y,Z).

"Ignored" means that these won't be used when you input coordinates for your surfaces, windows, overhangs, etc. but WILL be used in calculating actual Daylighting reference points.

Question
So does your answer mean that I can get a correct daylightiing simulation using only a relative system? Does that mean I will get a wrong building energy consumption (with daylighting) using the world coordinate system?

Answer
It is not correct to say that "a correct daylighting simulation result can be obtained only with relative system." If the building geometry has been set up using world coordinates, you can still use daylighting. The coordinates on the heat transfer surfaces honor the SurfaceGeometry rules for World or Relative coordinates. So, first, you must make sure that the surface coordinates are consistent with the geometry rule.

Daylighting reference points do not honor the setting in the SurfaceGeometry object. They are always relative to the zone origin. If the zone origin is 0,0,0, and the zone north axis is zero, then there is no difference between relative and world coordinates for that zone.

Meetings - Conferences - Symposia

	2007	
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
	2008	
Jul 30 to Aug 01	SimBuild 2008 – Campus of the Univ-ersity of California, Berkeley, California	http://gaia.lbl.gov/ocs/index.php/simbuild/2008 Deadline for Abstracts is December 2007!!!

Ask an EnergyPlus Expert . . .

WARMEST FUNCTION MODELING

I am modeling the warmest function in a Hospital building. The model is equipped with a VAV system (pre-heat coil, cooling coil, a central heating coil, and reheat coils). I have the warmest setpoint node set at the supply fan outlet. The warmest function is set up to deliver supply air between 55F and 60F. Also, the chilled water is delivered to the cooling coils between 44F and 52F, depending on outside air temperature.

When I increase the upper limit of the warmest function from 60F to 65F and the chilled water upper limit from 52F to 54F, the natural gas consumption of the boiler increases by 7%. In addition, the supply fan energy usage increases by 6%. The energy saving benefit of the chiller and the cooling tower, 2% and 3%, respectively, is not enough to overcome the boiler and fan energy usage increases. The overall energy usage (total facility) increases by 2%.

I am confused to why this is happening. How can increasing the reset temperatures increase overall energy consumption instead of decreasing it? Why is the heating energy usage increasing in this manner?

Answer
The fan energy increase makes sense if you increase the supply air temperature (you cannot avoid this). And the chiller savings also make sense if you increase the chilled water temperature. A reduction in cooling tower energy would only make sense if the load on the tower was reduced. Since the chiller energy (and not the load in the space) is reduced, the load on the tower is reduced. For the natural gas consumption, check the minimum air flow fraction on the VAV reheat boxes. The natural gas consumption will only increase if the sensible cooling delivered to the space increases when the VAV boxes are at the minimum air flow rate. Check the zone sensible cooling rate for the zones that have increased VAV box reheat energy. Find a time when the zone VAV box is at the minimum air flow rate (you can also look at the VAV box damper position for this check) and compare this zone sensible cooling rate to what you get when you change the set points. You could also reduce the minimum air flow fraction on the VAV boxes and the natural gas consumption should decrease. This can also be accomplished by decreasing the maximum air flow rate on the VAV boxes that are using more reheat. You want this type of reheat to be at a minimum if at all possible.

The increase in gas use is not right. If there is a central heating coil in this VAV system, and it is picking up it's setpoint from the air loop outlet node, it may be warming the cool mixed air so that some VAV damper somewhere can stay fully open at low cooling loads. Be sure the heating coil setpoint is not linked in any way to what the warmest set point manager is doing for cooling. No two setpoint managers should be setting a temperature setpoint on the same node.

U-VALUE OF MATERIAL USED

How can I find out the U-value of all the materials used in a model ?

Answer
EnergyPlus documentation is searchable; if you enter U-Value, you will find numerous examples. The nominal U-value in each surface (pdf p. 30 in the OutputDetails and Examples document) using the "Report, Surface, Details;" command as well as the "Report, Constructions;" command gives the "nominal thermal conductance" for each construction along with other information about the construction. You can also add a "Report, Materials;" command for similar information about each material referenced (whether used or not).

Ask an EnergyPlus Expert . . .

SYSTEM AVAILABILITY MANAGER

Is it possible to turn off only the chiller equipment part of the time and use outside air to maintain the temperature? I want to turn off the chiller and use outside air, via the supply fan, whenever the outside air reaches the appropriate temperature (free-cooling/mechanical ventilation). I'm using an electric chiller with an air-cooled condenser. When I tried using the system availability manager the entire system is turned off, including the fans, causing all sorts of problems.

Answer
You can specify a system availability manager for the chilled water plant loop. See PLANT LOOP "Chilled Water Loop Secondary Water Loop" in the example file IceStorage-Parallel.idf. However, if free cooling (outside air economizer) is enough to meet the cooling load, this should not be necessary. The cooling coil will not turn on and the chilled water loop will shut down (if the pump control is INTERMITTENT).

NATURALLY VENTILATED GREENHOUSE

I'm starting a project on a greenhouse that is naturally ventilated through openings at the top and at the bottom. The zone is 8 meters high. Do you think EnergyPlus can handle the thermal stratification and the buoyancy effect properly?

Answer
If you use the Airflownetwork model (based on AIRNET), the buoyancy effect for bulk ventilation flow can be modeled rather well, but stratification is not part of this model.
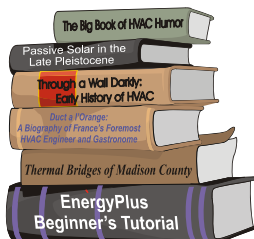
FREE-FLOATING SIMULATION

Can I simulate a free floating condition (no HVAC) with EnergyPlus?

Answer
The 1ZoneUncontrolled example file illustrates the free floating condition (no HVAC). Under purchased or other HVAC systems, you can use the control type "0" in your schedules during the times you want the system to float.

A Getting Started Tutorial for EnergyPlus

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

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

Dr. Vishal Garg of the International Institute of Information Technology in Hyderbad, India, 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 out-lines the procedures for modeling a small room using EnergyPlus, including instruction on how to run the simulation, and how to interpret the output files. The output presents both heating and cooling energy consumption so the user may experiment with size, orientation, material properties, location, etc., and compare heating/cooling energy usage.

http://energyplustutorial.googlepages.com/

Ask an EnergyPlus Expert . . .

DIRECT AIR MODEL

To model an AirLoop with Direct Air Terminal; is there an example file?

Answer
The Direct Air Terminal is a constant volume air distribution unit. This can be used with either constant or cycling fan air systems. Furnaces, Heat Pumps, and Unitary Systems would use this type of air distribution unit.

From the Engineering Reference on pg 392:

Direct Air
Central system air is usually supplied to a zone through a terminal unit such as a single duct VAV reheat box. Sometimes, however, it is desirable to supply central system air directly to a zone without any zone level control or tempering. An example would be Furnace or Central DX equipment. Direct air is the component used to pass supply air directly into a zone without any thermostatic control. The Direct Air unit allows the program to know what zone this branch of the air system is attached to and a place to input the maximum air flow rate.

The Direct Air object creates the capability of supplying central system air directly to a zone and only contains the zone inlet node. This node is both the zone inlet node and the outlet node of the Zone Splitter. It can be thought of as a balancing damper in the duct branch going to the zone. This inlet flow rate can be adjusted by a schedule. This can be thought of as a seasonal adjustment of the balancing damper.

For the Direct Air objects to work correctly, it is important in any systems including Direct Air objects for the sum of the maximum zone air flow rates to be equal to the maximum central system flow rate. The zone maximum flow rates are specified in the direct air inputs. The central air system flow rate is specified in the Air Primary Loop input and also in the air loop branch and central fan inputs.

OUTSIDE AIR AND DX COILS

I am having a hard time getting EnergyPlus DX coils to handle a 100% outdoor air flow. I am using a 100% outside air stream as the DOAS air stream, so I want the temperature to be neutral (18C), and I have a pre-defined volume airflow. I tried putting two multimode coils in series and two standard bypass factor coils in series. In both situations, I get a ton of warnings when I run the simulations, namely that the cfm/ton is out of range during the simulations. I must be setting something wrong. Is there a way to set up DX coils so that I can meet that 18C exit temperature without the warnings?

Answer
Assuming this is a constant volume system, two DX coils in series will work. The coils need to fall within the allowable flow/capacity range (0.00004027 to 0.00006041 m^3/s per watt of rated total cooling capacity, 300 to 450 cfm/ton). For example, for a flow rate of 4500 cfm, each coil could have a capacity of 10 to 15 tons. If this is not a constant volume system, then you will need to use Coil:DX:MultiSpeed:CoolingEmpirical with the same constraints at full flow.

Question
There are two BypassFactorEmpirical coils in series in a constant volume system. I've hand sized them to be within the cfm/ton limits (as near as I can tell) and I am still getting warnings about being over those limits (high air flow).

Answer
The problem is not the dual DX coils. Even with just one DX coil, the errors happen. For some reason some early iterations at certain time steps are throwing a flow rate >8 m^3/s at the ventilation system mixed air outlet. The reported flow rate for this node is always 3.781 as it's supposed to be. But when the DX coils see the higher flow rate, the warnings are tripped.

Ask an EnergyPlus Expert . . .

*.RVI AND *.CSV

My current problem is trying to force the contents of certain variables to a specific .csv column. This would allow me to process the values with the Excel file using very basic cell referencing. I have seen some discussions about using the .rvi file to force the column order of variables listed in .csv file.

Answer
You must use the .rvi file for this purpose. Whatever you put in report variables gets "shoved out" to the .eso file (or in case of meters also the .mtr file) as the information emerges in the simulation. The actual order for that would be shown in the first part of the .eso file (before the part that says "End of Data Dictionary").

In the .rvi file, you can either specify the generic form of the report variable, e.g.:
```
  Zone/Sys Air Temperature
  Zone/Sys Sensible Heating Energy
  Zone/Sys Sensible Cooling Energy
```

or be really specific:
```
  Zone 1:Zone/Sys Air Temperature
  Zone 1:Zone/Sys Sensible Heating Energy
  Zone 1:Zone/Sys Sensible Cooling Energy
```

The first instance will give you all the zones, Zone/Sys Air Temperature, followed by all the Zones, Zone/Sys Sensible Heating Energy, etc. The second instance will put the three variables by zone. There are also ways of extracting the hourly or monthly values in a .csv file even though the .eso file may contain multiple hourly and monthly mixed. You might want to explore using the utility XESOView (not part of the EnergyPlus install). Information on XESOView is on the Yahoo groups website and at www.energyplus.gov.

Building Energy Events from the Pacific Energy Center, San Francisco

Commissioning
Dec 04	**Commissioning and Design Resources for the Resourceful**

Daylighting
Nov 01	**Design Methods for Daylighting**

Incentive Programs
Oct 13	**Solar Power Basics for Residential Customers**
Nov 08	**Maximizing Lighting Energy Savings with Utility Rebates**

Lighting
Nov 08	**Maximizing Lighting Energy Savings with Utility Rebates**
Nov 27	**Introduction to Lighting Design**

Marketing + Finance
Oct 15	**BOMA BEEP Seminar 6: Building an Energy Awareness Program - An Online Course**

Renewables
Nov 06	**Photovoltaic (PV) Site Analysis and System Sizing**
Nov 07	**Field Verification and Diagnostic Testing of Photovoltaic Systems for Installers**
Nov 290	**Photovoltaic (PV) Site Analysis and System Sizing**

Ask an EnergyPlus Expert . . .

SIMULATING DOUBLE SKIN FAÇADE

I'm simulating an office with a double skin façade using the "exterior vented natural cavity."
The façade is naturally ventilated and has Venetian blinds in the gap. The blinds are exposed to solar radiation and, during the day, they can reach very high temperatures which may affect the temperature of the air in the gap and/or the performance of the glass façade. Does EnergyPlus take into account these two effects?

Answer
The exterior vented natural cavity model is for *opaque* surfaces only and does not apply to glazing systems. There is a model for blinds in the window gap that takes those two things into account, but I am not sure if it works together with the air flow window model.

Question
Thanks for your answer. I compared two simulations, one with the façade as exterior vented cavity and the other with the façade as a simple window, and it seemed that solar transmission through the glazing system is the same in both the cases. Even if the exterior vented cavity is only for opaque surfaces do you think it is possible to use the model for a glass façade, using as input the data of the glazing system (thermal emissivity and solar absorbtivity)? Which differences or errors would occur using that model?

Answer
If I understand you correctly, I think what you are actually getting in the model is a regular window surrounded by a wall with a double skin. See if the inside face wall surface temperatures are different. The window shouldn't be changing.

The exterior vented cavity model, which assumes that all the solar is blocked by a thin, solid layer on the outside, cannot be used for glazing. Opaque means no transmission. Inside EnergyPlus this becomes a special boundary condition for surface heat transfer modeling that is not available for window modeling. The window still gets exterior environment boundary conditions even though its parent surface has the exterior cavity boundary condition.

Double façade improvements are being planned for the future.

Possible Workaround
if you really wanted to use the exterior vented cavity model on your DF, it could apply to a case where the double façade has totally opaque shades that are closed tight. You would use regular materials in the construction for the surface that approximate the DF (no subsurface and no glazing materials). The baffle in the exterior cavity model can get quite hot and then re-radiate infrared (but no shortwave) and convect to the underlying surface. But note that air gap models are much better developed for windows than for regular constructions; you would have to come up with thermal properties for each layer. One advantage of this approach might be a better model of transient behavior because the window models are always steady state.

See also: EnergyPlus Technical Note – Opaque Ventilated Façades (July 2007 *User News*)
On May 28, 2007, Emanuele Naboni (PhD Candidate), a visiting researcher from the Politecnico di Milano (Italy) gave a lecture at Lawrence Berkeley National Laboratory on how he used EnergyPlus to model Ventilated Opaque Façades. A .pdf of his presentation is available at http://SimulationResearch.lbl.gov/reports.html under the heading "All EnergyPlus Reports."
To save time, here is the direct link: http://simulationresearch.lbl.gov/dirpubs/vent_facade.pdf

Ask an EnergyPlus Expert . . .

WINDOW5 DATA VS IDF

I use a Window5 data file for my windows properties, and I would like to know what the best strategy is to model the window (detail vs accuracy vs time).

In the IDF file, I modeled the windows as a long, continuous, horizontal strip in the external wall. However in Windows5 I modeled the windows in the correct dimensions (glass+frame).

I initially thought that the Window5 data would take precedence over the IDF dimension. But referring to the manual, I found that this is not true. When there is a discrepancy in the dimension between IDF and Window5, then IDF dimension will take precedence. The glass properties will be taken from Window5, but the dimension will be from IDF file. But what about the frame? The manual does not mention anything about the frame, will the properties be taken from the Window5 file or from IDF?

This brings the question back to the best way to model the window. If we want to justify, for example, that a certain window is so good that we do not need the perimeter heating, then we need to model the frame as detailed as possible. Do we really need to model every window exactly to its dimension? This will increase the simulation run time tremendously.

Answer
You are correct that the dimensions of your window, as input in the IDF, will take precedence over the dimensions of the window in the Window5 data file, *UNLESS* the window in the Window5 data file contains two sections that have different glazing systems, in which case the Window5 dimensions will be used. See details of this under "Importing Windows from Window 5" in the "Group - Thermal Zone Description/Geometry" section of the Input/Output Reference.

The frame that is part of the Window 5 data file will be used to create a WindowFrameAndDivider object that will be assigned to the window for EnergyPlus analysis. EnergyPlus will generate a warning if the dimensions of the window in your IDF differ from the Window5 dimensions by more than 10%. This warning indicates that some inaccuracy may result because of the different area and perimeter relationships between the glass area and the frame. Unless you are especially concerned with the frame effects, you should create a simple narrow frame in your Window5 file to reduce these differences. It is not possible to create a Window5 window system for export to EnergyPlus without including some type of frame.

The importance of modeling your windows precisely depends on what you are trying to analyze.
If you are interested in daylighting effects, then it is important to model the windows accurately.
If you are only looking for general thermal effects, then this is not as important.

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 websiste: http://www.ibpsa-germany.org/

Ask an EnergyPlus Expert . . .

AIRFLOW NETWORK FAN

I am starting to use the AirFlow Network with only the MultiZone:Surfaces, referring to the SIMPLE house example. From the .err file, a zone needs two surfaces and I have added a door to each zone. So, correct me if I am wrong, but my understanding is that the air in the AirFlow Network goes through ceiling crack/leakage and door leakage. I did not use Direct air or fan as in the Simple House example but I do have a Window AirConditioner in the second zone.

The error message included this statement:

```
 GetFanIndex: Fan not found=Zone2WindACFan
 GetAirflowNetworkINput: The fan type defined in
 AIRFLOWNETWORK:DISTRIBUTION:COMPONENT CONSTANT VOLUME FAN =
 ZONE2WINDACFAN is not allowed etc.
```

I assume that the 'Fan' in the error message refers to the fan in Window AC. But how do I enter the index of this fan or overcome the errors in the .err file?

Answer
After reviewing your input file, it doesn't look like you specified a fan as Zone2WindACFan; that is what generated the first error message (GetFanIndex: Fan not found=Zone2WindACFan). In other words, Zone2WindACFan is not listed in fan index. You may define the fan in the AIRFLOWNETWORK:DISTRIBUTION:COMPONENT CONSTANT VOLUME FAN object. Since the fan is not listed in the fan index, the program could not continue.

My suggestion is to disable the AirflowNetwork model first to see whether you can eliminate the first error. The model disablement is to use the choice of NO MULTIZONE OR DISTRIBUTION in the AirflowNetwork Control field in the AirflowNetwork Simulation object.

By the way, Window AC is not supported for the time being if you use the choice as MULTIZONE WITH DISTRIBUTION or MULTIZONE WITH DISTRIBUTION ONLY DURING FAN OPERATION in the AirflowNetwork Control field in the AirflowNetwork Simulation object

Question
Many thanks for the information on how to disable the AirFlow Network.

I will try Infiltration first. Do you have any advice on which variables to use for this object if the infiltration to the attic (space between the horizontal overhang ceilings and the sloping roof) is only through the corrugations in the roofing metal sheets as they are nailed to a horizontal wood?

Meanwhile, is Compact HVAC:System:Unitary supported if I use the choice as MULTIZONE WITH DISTRIBUTION or MULTIZONE WITH DISTRIBUTION ONLY DURING FAN OPERATION in the AirflowNetwork Control field in the AirflowNetwork Simulation object?

Answer
I don't have suggestions on attic infiltration. You may try to find values in other publications.

The AirflowNetwork model requires an air primary loop. Any coils and fan have to be a part of the loop. The allowed coil types are listed in the EnergyPlus .idd and Input/Output Reference.
An example input file of AirflowNetwork_Multizone_House.idf uses
UNITARYSYSTEM:HEATPUMP:AIRTOAIR. The unitary system uses allowed coil types. The answer to your question is that if a compact unitary system uses allowed coil types, it should work.

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).

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

+ YAHOO! TECH

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

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Cool Website of the Month:

NIST Virtual Museum -- http://museum.nist.gov/exhibits/index.html

Did you know that the venerable National Institute of Standards and Technology maintains a Virtual Museum for your armchair browsing pleasure? Their virtual exhibits range from "The Standardization of Women's Clothing" to "The BAT Missile" and on and on. And while the NIST Virtual Museum isn't as riveting as, say, the Rock and Roll Hall of Fame Museum (http://www.rockhall.com/), it is a fascinating look how we have organized and quantified our world.
While you're there, don't miss a stroll through the NIST Photo Gallery (http://museum.nist.gov/panels/gallery/photogallery.html), where you'll find photos of World War I Airplane Research, a Railway Scale Test Car, WWII Ordnance, etc. Great stuff!

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.