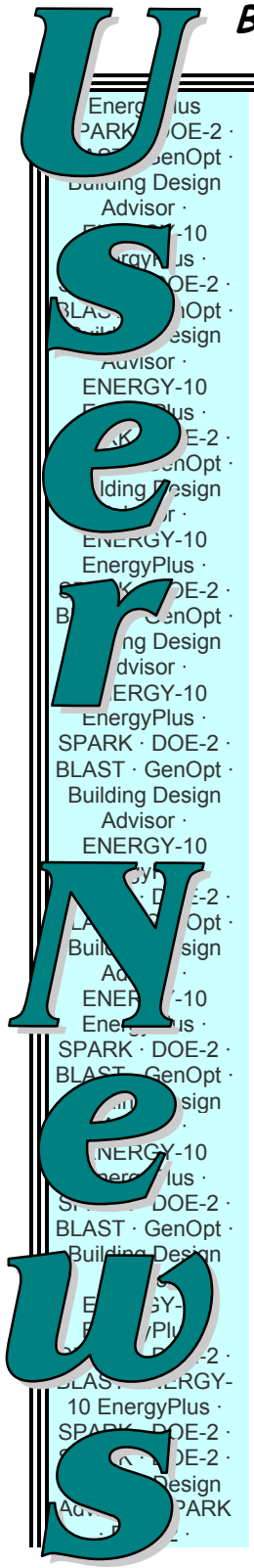
VOLUME 24, NO. 1 ● JANUARY/FEBRUARY 2003 (PUB-439)

BUILDING ENERGY SIMULATION

For Users of EnergyPlus, SPARK, DOE-2, BLAST, GenOpt, Building Design Advisor, ENERGY-10 and their Derivatives



EnergyPlus Version 1.0.3

To download a free copy of the program go to www.energyplus.gov

EnergyPlus Support Tools

Support software is listed on our website (http://simulationresearch.lbl.gov/EP/ep_tools.html) and on p. 17 of this newsletter.

EnergyPlus Weather Data at http://www.energyplus.gov/

There are 275 locations in the United States, 16 California thermal zones, 55 Canadian locations, and 233 international locations in more than 80 countries. We recommend that you also download the weather utility RPT file for each location. The RPT file includes design data where available, statistics for the weather file, including typical and extreme periods (hottest summer week, coldest winter week, typical spring week, etc), Koppen climate classification, heating and cooling degree days, monthly average minimum and maximum dry bulb and dew point temperatures, undisturbed ground temperatures, direct and diffuse solar radiation, relative humidity, and wind speed and direction.

Ask an EnergyPlus Expert

Questions from EnergyPlus users are answered by program developers. Download the Q&A pdf file from 2002 here. To submit questions, join the EnergyPlus User Group: http://groups.yahoo.com/group/EnergyPlus_Support/.

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 email 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/

Translate EnergyPlus Web Pages

A new link on the main EnergyPlus web page (http://www.energyplus.gov/) allows users to view the pages in any of eight languages. Unfortunately, the translator doesn't work with PDF files. Look for the fish at the bottom of the web page. Pages may be translated into Chinese, French, German, Italian, Japanese, Korean, Portuguese and Spanish.

EnergyPlus is being developed by University of Illinois, CERL, and Lawrence Berkeley National Laboratory, with the assistance of the Florida Solar Energy Center, GARD Analytics, the University of Wisconsin, Oklahoma State University and others. Development of EnergyPlus is supported by the U. S. Department of Energy, Dru Crawley, Program Manager.

Ask An EnergyPlus Expert

Question: Report Variable *SUMHAT [J]*

Will you explain the variable *SUMHAT [J]* that appears in the report variable data dictionary.

Answer:

The short answer is twofold:

- *SUMHAT* is a "developer"/debug variable that a developer might use to determine if the heat balance calculation is going properly, but is not labeled as such. It's not really intended for users. It is the sum of product of heat trans coefficients, surface area and inside surface temperature.

Here is a somewhat longer explanation:

- *SUMHAT* is an internal variable, used during the calculation of the zone air heat balance. It is calculated during the inside surface heat balances.
- *SUMHAT* applies to a particular zone and is the sum of the product of *h*, *A*, and *T* for each surface:
  - *h* is the convection coefficient for a particular surface (this can vary with temperature difference, orientation, etc.).
  - *A* is the area for a particular surface.
  - *T* is the temperature of the surface (°C). Note that *T* is not the temperature difference between the surface and the zone air because EnergyPlus must solve for the zone air temperature.

So, for each zone, during the inside surface heat balance, EnergyPlus sums up *hAT* for each surface in that zone and stores this value in the variable *SUMHAT*. The number reported is in Joules [J].

Question: Variable Speed Pump Equation

Please verify the equation listed in the Input-Output reference manual for Pump:VariableSpeed, page 291. The last Part Load Ratio (PLR) term in the equation is to the fourth power. Should the last term in the equation be to the third power?

Answer:

Yes, the last term should be to the third power. Here's the equation from the code:

```
   FracFullLoadPower
=    PumpEquip(PumpNum)%PartLoadCoef(1)                          &
                       + PumpEquip(PumpNum)%PartLoadCoef(2)  *
PartLoadRatio      &
                       + PumpEquip(PumpNum)%PartLoadCoef(3)  *
PartLoadRatio**2   &
                       + PumpEquip(PumpNum)%PartLoadCoef(4)  * PartLoadRatio**3
```

Ask An EnergyPlus Expert

Question: Steady State Temperature – Part I

In the Control Types Schedules, say for the thermostat of a VAV with reheat, you are using discrete numbers 0 through 4. When the Day Schedules are created, I assume each whole number in the Day Schedule corresponds to a type of control such as SINGLE COOLING SETPOINT or DUAL SETPOINT WITH DEADBAND and is used to switch between the different types of control based on occupancy. How is the correlation made between the whole numbers used in the Day Schedule and the type of control?

Answer: (see pp. 324ff in the Input Output Reference for more details)

0 – Uncontrolled (No specification or default)
1 – Single Heating Setpoint
2 – Single Cooling Setpoint
3 – Single Heating/Cooling Setpoint
4 – Dual Setpoint (Heating and Cooling) with deadband

Question: Steady State Temperature – Part II

I would like to simulate the temperature in a room with an internal load of 1000 W, the external temperature at constant 22°C. I do not apply a weather file but would like to estimate the steady state temperature in that room. This requires a run period of several weeks. Which objects do I need to define to get the required result. So far I can model only one day.

Answer:

What you will need is to artificially prepare a weather file with the appropriate outdoor conditions. Fortunately, this is fairly easy with the EnergyPlus WeatherConverter program (folder preprocess\weatherconverter). Generate a .csv file of your appropriate location. Take that file into Excel for easy editing, and replace the dry bulb temperature with your 22°C temps. You will need to determine an appropriate dew point as well. Delete the rows beyond where you want the simulation to proceed (or not). Now direct the Weatherconverter program to convert a .csv file to the normal .epw file and then use this as your weather file for the simulation.

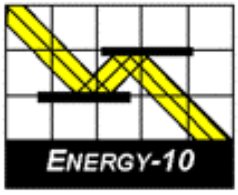
Pacific Gas and Electric Company™

WE DELIVER ENERGY.℠

PG&E Spring 2003 Programs

To register phone 415.973.7268 or go to www.pge.com/pec

WHOLE BUILDING	
March 12 -- 9:00 am to 12:00 pm	Introduction to Building Commissioning
April 8 – 6:00 pm to 9:00 pm	Basic Electrical Concepts
April 29 – 9:00 am to 4:30 pm	Packaged HVAC: Data, Diagnostics and Analysis
HVAC	
March 20 – 9:00 am to 1:00 pm	Exceeding Title 24
April 16 – 9:00 am to 4:30 pm	Designing Mechanical Systems for Indoor Air Quality
April 30 – 9:00 am to 4:30 pm	BACnet: the Nuts and Bolts
ARCHITECTURE	
March 6 -- 9:00 am to 12:00 pm	Beyond the Raised Floor: Green Building HVAC Systems
March 14 – 9:00 am to 4:30 pm	Basics of Photovoltaic Electric Systems
March 20 – 9:00 am to 1:00 pm	Exceeding Title 24
April 1 – 1:00 pm to 4:30 pm	Solar Schools: PV as a Learning Tool
April 2 – 9:00 am to 4:30 pm	Cool Roofing
April 3 – 9:00 am to 1:00 pm	Lighting for Schools
April 11 – 9:00 am to 1:00 pm	The Glass Class
April 15 – 9:00 am to 4:30 pm	LEED™ in Practice
LIGHTING	
March 4 – 9:00 am to 4:30 pm	Daylighting Basics for Architects and Electrical Engineers
March 19 – 9:00 am to 4:30 pm	Big Box Retail Lighting
March 25 – 6:00 pm to 9:00 pm	Lighting Design for Architects
March 20 – 9:00 am to 1:00 pm	Exceeding Title 24
March 20 – 9:00 am to 1:00 pm	Exceeding Title 24
April 3 – 9:00 am to 1:00 pm	Lighting for Schools



ENERGY-10, VERSION 1.6

ENERGY-10 is a design tool for smaller residential or commercial buildings that are less than 10,000 ft^2 or buildings that can be treated as 1- or 2-zone increments. It performs whole-building energy analysis for 8760 hours/year, including dynamic thermal and daylighting calculations. ENERGY-10 was specifically designed to facilitate the evaluation of energy-efficient building features in the very early stages of the design process.

Version 1.6 Upgrades

Synchronize Libraries
Libraries may now be associated with more than one building.

Free Run Mode
Automated process of monitoring how a building operates without any HVAC system.

Clear All Internal Gains
The name is self-explanatory.

New Buttons on Provisional Data Dialog Box
Users may specify whether they want autobuild HVAC sizing to be computed with or without daylighting.

Performance Summary Reports
Three performance summary reports have been added. One is a simple performance summary, which breaks down the standard summary into more readable chunks and adds a column that reflects the percentage change of going from Building 1 to Building 2. The other two are daylighting reports that show the standard daylighting factor calculated for each lighting zone.

NewDefaults Library
A new set of libraries contains all the standard libraries such as floorlib, rooflib, etc. with updated values.

Registry Path for ENERGY-10 Data
New registry path allows users to maintain separate copies of the three most recent versions of *ENERGY-10*. In addition, the installation script allows installation for either "all users" or the "current user only."

Additional Tutorials on Installation CD
Three new tutorials are included in the slide show section of the installation CD, including Economics, Daylighting, and Using *ENERGY-10* in the Design Process.

Douglas K. Schroeder
1331 H Street N.W., #1000
Washington, DC 20004

Tel: 202.628.7400 ext 210
Fax: 202.383.5043
www.sbicouncil.org

Sustainable Buildings Industry Council (SBIC)

ENERGY-10 User Group at http://www.sbicouncil.org/forum
SBIC Bookstore at http://www.sbicouncil.org/store/resources.php#pubs

Release of *EnergyGauge 2.0*

Code Compliance and Home Energy Rating Software

EnergyGauge USA is a user-friendly home energy simulation software tool that uses DOE 2.1-E as its calculation engine. Features of version 2.0 include:

Addition of Evaporative Cooling systems

Expanded Utility rate inputs

Water Heater tank wraps and Refrigeration have been added to refine estimates of appliance energy use.

Window and Wall descriptions are now entered by orientation with doors and windows located within a wall. In addition to various wall constructs, a separate thermal mass input screen has been added to allow for greater accuracy of passive solar heating options. In addition, users may now model insect screens and their shading effects.

Solar Thermal Simulations Most building simulations use simple solar savings fractions for solar thermal systems; however; these methods do not account for climate-specific performance. EnergyGauge 2.0 allows users to enter detailed descriptions for solar water heating systems so that solar thermal systems may be matched with climate-specific performance. The model accounts for a PV pump to be specified and provides default solar inputs that enable users to explore the potential for solar without having detailed system specifications.

Photovoltaic Systems (PV) are modeled with Sandia National Laboratory's PVForm, which provides a detailed analysis based on the module, orientation, tilt and inverter. Databases of current PV modules and inverters are included with the software and a new set of PV reports has been added.

Detailed Attic Model

Hourly Reports

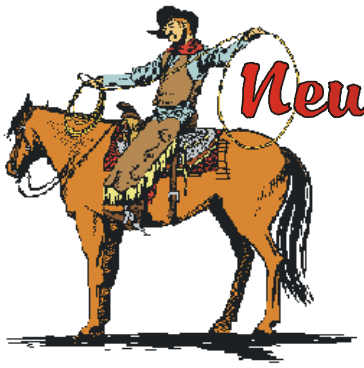
- capability to export data to a spreadsheet or database
- new hourly reports and graphs
- users can select any day of the year or any consecutive period, graph a daily profile and compute minimum, maximum, average and total values for the parameter.

Please direct technical questions to dparker@fsec.ucf.edu

EnergyGauge®

fsec

Energy and Economic Analysis Software



Newsletter Roundup

Newsletters are a great way to keep up to date on news within the building energy efficiency community. Here is our "short list" of the best.

Advanced Buildings http://greenbuilding.ca/GBIC.htm

Newsletter of the Royal Architectural Institute of Canada. Building simulation activities in Canada..

CADDET http://www.caddet.co.uk/

The International Energy Agency's newsletter on energy efficiency. Practical and innovative articles by international energy researchers and practitioners.

CARB-News **http://www.carb-swa.com/carbfax.html**

CARB, the Consortium for Advanced Residential Buildings, presents updates on the Building America program

e-FFICIENCY NEWS http://www.ase.org/about/about.htm

The bi-monthly electronic newsletter from the Alliance to Save Energy.

Energy User News http://www.energyusernews.com/

Trade publication covers energy efficiency in new and existing non-residential buildings.

EREN News http://www.eren.doe.gov/news/

Energy Efficiency and Renewable Energy Network of the U.S. Department of Energy. EREN Network News is a weekly electronic newsletter covering energy efficiency and renewable energy news.

Green Energy News http://www.nrglink.com/index.html

Weekly online publication offers news about energy efficiency and related "green" energy issues for non-residential facilities, etc.

Home Energy Magazine http://homeenergy.org/hewebsite/

Not a newsletter, but the best resource available for issues pertaining to home energy.

IBPSA News http://www.mae.okstate.edu/ibpsa/newslett.htm

Newsletter of the International Building Performance Simulation Association (IBPSA). Technical articles about building simulation techniques, conference news.

Lighting Design Lab http://www.northwestlighting.com/ldl

Lighting lab activities in the Pacific Northwest. Lots of workshops and classes listed.

Lighting Futures http://www.lrc.rpi.edu/Futures/index.html

Articles on emerging lighting technologies. Great resource list of lighting web sites and contacts.

Setting the Standard http://www.energycodes.gov/news/

Newsletter of the U.S. Department of Energy's Building Standards and Guidelines Program.

WinterGreen http://www.swinter.com/company/WinterGREEN.html

WinterGREEN is an update on the work of Steven Winter Associates, Inc. Each issue presents reports from the field and presentations on sustainable building systems and concepts

Recent Reports

This book is available from the Building Technologies Department of Lawrence Berkeley National Laboratory. The book comes with a CD of the complete text plus supplementaryl material not included in the hard copy. You may order either the book-plus-CD or the CD by itself. Please email your request to JeShana Bishop and indicate whether you would like the book with the CD or the CD b itself.

Report of IEA SHC Task 21/ ECBCS Annex 29

Daylight in Buildings
A Source Book on Daylighting Systems and Components

by

Nancy Ruck with Øyvind Aschehoug, Sirri Aydinli, Jens Christoffersen, Gilles Courret, Ian Edmonds, Roman Jakobiak, Martin Kischkoweit-Lopin, Martin Klinger, Eleanor Lee, Laurent Michel, Jean-Louis Scartezzini, and Stephen Selkowitz
Edited by Øyvind Aschehoug, Jens Christoffersen, Roman Jakobiak, Kjeld Johnsen, Eleanor Lee, Nancy Ruck, and Stephen Selkowitz

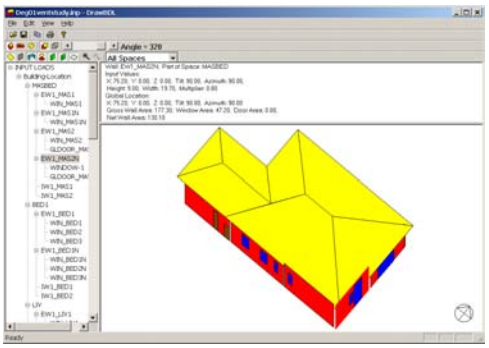
Executive Summary

This source book gives a comprehensive overview of innovative daylighting systems, the performance parameters by which they are judged, and an evaluation of their energy savings potential and user acceptance. The book has been written to overcome a lack of evidence of the advantages of daylighting in buildings and a lack of knowledge regarding the performance of innovative daylighting systems in buildings in various climatic zones around the world. The information presented here is intended to be used in the earliest stages of the building design process.

DrawBDL 3.0

Joe Huang and Associates is pleased to announce Version 3.0 of the DrawBDL program for viewing the building geometry in DOE-2 input and output files. DrawBDL has been completely rewritten using C++ to run in a native 32 bit environment such as Windows 95/2000/NT. In addition to having a new look and feel, Version 3.0 has the following improvements:

- New user interface with a hierarchical tree showing all building surfaces.
- No limit on the number of building surfaces, except for the amount of memory available on the computer.
- For building surfaces, the expanded data window shows not only the input values, but also their locations in the global coordinate system; for spaces, the data window shows the gross and net areas of walls, windows, doors, roofs, and skylights.
- Displays surfaces input as 2-D or 3-D polygons (please see DOE-2.1E Documentation Update #2 http://SimulationResearch.lbl.gov/dirsoft/21e_update2.pdf for the syntax to input surfaces as polygons).



DrawBDL 3.0

- Changing the sort order of building surfaces used in the display; this allows users to "touch up" the shaded drawings for use in presentations.
- Output the surface data in EnergyPlus *.idf format. This is helpful for DrawBDL users who wish to convert their DOE-2 input files into EnergyPlus input files. Since DrawBDL reads and stores only building surface data, the converted EnergyPlus file is a partial file containing only the inputs for building surfaces.

DrawBDL 3.0 costs $125 plus shipping (same price as the older version); for more information or to order, please contact ➔

Joe Huang and Associates
31 Sarah Lane
Moraga CA 94553

Phone 925-247-9180
tmchow@compuserve.com

GenOpt 1.1.2

Generic Optimization Program

GenOpt *is a multi-parameter optimization program; it automatically finds the values of user-selected design parameters that minimize a cost function, such as annual energy use, calculated by an external simulation program like EnergyPlus, SPARK, DOE-2, BLAST, TRACE, TRNSYS, etc.*

GenOpt *can be used with any simulation program that has text-based input and output. It also offers an interface for adding custom optimization algorithms to its library.*

Release of GenOpt 1.1.2

GenOpt 1.1.2 fixes problems in reading simulation output files where the objective function value is followed by a comma. Such output strings can be found, for example, in some EnergyPlus outputs.

Also, a method called 'postProcessObjectiveFunction(int, double[] f)' has been added to the file named 'Optimizer.java'. You can modify this function to easily implement post-processing of the objective function value, such as adding two outputs to seek the minimum of the sum of the two outputs.

Example files have been added to the ***GenOpt*** web page (http://SimulationResearch.lbl.gov > GenOpt) to help users set up the program to optimize EnergyPlus simulations. ***GenOpt*** input files still have the same syntax as in version 1.1.1. Therefore, your ***GenOpt*** input files are compatible with the new version.

GenOpt 1.1.2 **(with user manual) may be downloaded free of charge from**

http://SimulationResearch.lbl.gov > GenOpt

Building Design Advisor 3.0

DECISION MAKING THROUGH THE INTEGRATED USE OF MULTIPLE SIMULATION TOOLS AND DATABASES

The **Building Design Advisor (BDA)** is a Windows® program that addresses the needs of building decision-makers from the initial, schematic phases of building design through the detailed specification of building components and systems. The BDA is built around an object-oriented representation of the building and its context, which is mapped onto the corresponding representations of multiple tools and databases. It then acts as a ***data manager*** and ***process controller***, automatically preparing input to simulation tools and integrating their output in ways that support multi-criterion decision-making. BDA 3.0 includes links to **SGE** (a grapical editor for schematic design), **DElight** (a daylighting simulation tool), **ECM** (a simplified electric lighting simulation tool) and the **DOE-2.1E** building energy simulation program.

ECM, an **electric lighting simulation tool**, is integrated through BDA with DOE-2. BDA's Schematic Graphic Editor (**SGE**) allows placement of electric lighting luminaires and specification of reference points for daylight-based electric lighting controls. Moreover, BDA has the capability of **running DOE-2 parametrically** to generate a plot that shows the relationship between effective aperture and energy requirements. There is also the added functionality of working with either **English units or Metric units**.

Current development efforts are focused on the completion of BDA 3.1, which includes computation of operating energy costs. To download a free copy of BDA 3.0, go to

http://gaia.lbl.gov/BDA/index.html

The BDA source code is available for licensing; if interested, please contact Dr. Papamichael at K_Papamichael@lbl.gov.

For Beta Testing of BDA 3.1, contact Kosta Papamichael at k_papamichael@lbl.gov.

Eley Associates offers VisualDOE 3.1 + LEED Training

To be held in San Francisco, CA, March 19-21

Instructors: Erik Kolderup, VP, P.E. and Tianzhen Hong, Ph.D., P.E.

March 19, 20 (two-day VisualDOE)

This hands-on 2-day training session provides a detailed overview of building energy simulation using VisualDOE; it also includes a brief introduction to DOE-2.1E.

March 21 (one-day LEED)

This optional third day training focuses on how to use VisualDOE 3.1 for LEED energy saving calculations.

Registration

Please register online at http://www.eley.com/gdt/visualdoe/vd_training.htm

For questions, contact Dr. Tianzhen Hong or Erik Kolderup at Eley Associates, Phone: 415-957-1977, Fax: 415-957-1381 or send email to: mailto:training@eley.com

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 (pre-retrofit) buildings.

BLAST contains three major sub-programs:

- **Space Load Prediction** computes hourly space loads in a building 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)
The BLAST graphical interface (HBLC) is a Windows-based interactive program for producing BLAST input files. You can download a demo version of HBLC (for MS Windows) from the BLAST web site (User manual included).

HBLC/BLAST Training Courses
Experience with the HBLC and the BLAST family of programs has shown that new users can benefit from a session of structured training with the software. The Building Systems Laboratory offers such training courses on an as needed basis typically at our offices in Urbana, Illinois.

WINLCCID 98
LCCID (Life Cycle Cost in Design) was developed to perform Life Cycle Cost Analyses (LCCA) for the Department of Defense and their contractors.

To order BLAST-related products, contact the Building Systems Laboratory at the address above.

Program Name	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 package is on a single CD-ROM and includes soft copies of the BLAST Manual, 65 technical articles and theses related to BLAST, nearly 400 processed weather files with a browsing engine, and complete source code for BLAST, HBLC, etc. Requires an IBM PC 486/Pentium II or compatible running MS Windows 95/98/NT.	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. This will enable you to see if you have the most recent version. All software will be shipped on 3.5" high density floppy disks unless noted otherwise.

DOE-2

DOE-2.1E (v. 119) 1,000-Zone version for Windows from ESTSC; other vendors of DOE-2 based programs are listed on our website: http://SimulationResearch.lbl.gov > DOE-2

Cost is as follows:

$ 300	U.S. Government, non-profit Educational
$ 575	U.S., Mexico, Canada
$ 1268	Japan only
$ 1075	All Other Non-U.S.

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

What is included on the CD?

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

Order Software and ESTSC Documentation

Ed Kidd
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 remaining DOE-2 manual not available electronically. It must be purchased separately from NTIS; information is at http://SimulationResearch.lbl.gov > DOE-2 > Documentation

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

- DOE-2 Basics (2.1E)
- Update Package #1: DOE-2.1E Basics, the Supplement and BDL Summary
- Update Package #2: (Version 107, DOE-2.1E) BDL Summary and Supplement.

DOE-2 Basics and Update Packages 1, 2, 3 and 4 are not included on the ESTSC CD. They consist of scanned pdf files and may be downloaded from our web site. You may also request the same information on a CD by sending email to klellington@lbl.gov.

The update files need to be printed and the update pages inserted into the existing DOE-2 manuals.

DOE-2 listings are continued on the next page

--Continued—

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

- Update Package #3: Appendix A of the Supplement.
- Update Package #4: (1000-zone DOE-2.1E) BDL Summary.
- DOE-2 Modeling Tips (pdf)

Note that the Update Packages are **not** cumulative and each one contains different information. You have to download all four packages to update the DOE-2 documentation completely.

DOE-2 Modeling Tips is a compilation of all the "how to" articles from the *Building Energy Simulation User News* (through 2002).

DOE-2 Training

Private or group DOE-2 courses for beginning and advanced users: Contact Marlin Addison at (602) 968-2040, marlin.addison@doe2.com

DOE-2 Help Desk

Email, phone or fax the Simulation Research Group with your questions (klellington@lbl.gov).
Phone: (510) 486-5711, Fax: (510) 486-4089

SPARK is an equation-based simulation environment that allows you to build customized models of complex physical processes by connecting calculation objects that represent system components like walls, fans, heat exchangers, chillers, ducts, mixing boxes, controls, etc. It is aimed at the simulation of innovative and/or complex building systems that are beyond the scope of whole-building programs like DOE-2 and EnergyPlus. VisualSPARK adds a graphical user interface to SPARK to simplify use of the program.

DOWNLOAD VISUALSPARK 1.0.2 FREE OF CHARGE FROM

HTTP://SIMULATIONRESEARCH.LBL.GOV > VISUALSPARK

SPARK WAS DEVELOPED BY THE SIMULATION RESEARCH GROUP OF LAWRENCE BERKELEY NATIONAL LABORATORY AND BY AYRES SOWELL ASSOCIATES, WITH SUPPORT FROM THE ASSISTANT SECRETARY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY, OFFICE OF BUILDING TECHNOLOGY PROGRAMS OF THE U.S. DEPARTMENT OF ENERGY, PROGRAM MANAGER DRU CRAWLEY.

FREE Membership in 2003!!!

International Building Performance Simulation Association USA Affiliate

The IBPSA-USA Board of Directors has waived the annual membership fee for 2003 so joining IBPSA is easier than ever. If you want to become a member, send an email with your name, company, mailing and email address, and phone and fax numbers to Rick Strand to r-strand@uiuc.edu. You will receive a confirmation email to indicate that you have been accepted for membership. Free Membership for USA Affiliates only.

www.ibpsa.org

Building Energy Software from Lawrence Berkeley National Laboratory

Free Downloads	
BDA 3.0 (Building Design Advisor)	**gaia.lbl.gov/BDA**
COMIS (multi-zone air flow and contaminant transport model)	**www-epb.lbl.gov/comis**
***EnergyPlus* 1.0.3** (new-generation whole-building energy analysis program, based on BLAST and DOE-2)	**www.energyplus.gov** --or-- **SimulationResearch.lbl.gov > EnergyPlus**
***GenOpt*® 1.1.2** (generic optimization program)	**SimulationResearch.lbl.gov > GenOpt**
Optics 5.1 (for analyzing optical properties of glazing systems)	**windows.lbl.gov/materials/optics5/**
RADIANCE (analysis and visualization of lighting in design) ***Desktop Radiance*** (integrates the Radiance Synthetic Imaging System with AutoCAD Release 14) ***Radiance Control Panel*** (automates some Radiance tasks once the model has been created)	**radsite.lbl.gov/radiance/** **radsite.lbl.gov/deskrad/** **www.squ1.com/site.html**
RESEM (Retrofit Energy Savings Estimation Model) (calculates long-term energy savings directly from actual utility data)	**eetd.lbl.gov/btp/resem.htm**
SUPERLITE (calculates illuminance distribution for room geometries)	**eetd.lbl.gov/btp/superlite2.html**
THERM 2.1a (models two-dimensional heat-transfer effects in building components where thermal bridges are of concern)	**windows.lbl.gov/software/therm/therm.html**
VisualSPARK 1.0.1 (Simulation Problem Analysis and Research Kernel) (connect component models to simulate innovative building envelope and HVAC systems)	**SimulationResearch.lbl.gov > VisualSPARK**
WINDOW 5 (thermal analysis of window products)	**windows.lbl.gov/software/window/window.html**
Free Software / Request by Fax from 510.486.4089	
RESFEN 3.1 (choose energy-efficient, cost-effective windows for a given residential application)	**windows.lbl.gov/software/resfen/resfen.html**
Web Based	
Home Energy Saver (quickly computes home energy use) and ***Home Improvement Tool*** (simplified Home Energy Saver)	**hes.lbl.gov** and **hit.lbl.gov**
Purchase	
ADELINE 2.0 (daylighting performance in complex spaces)	**radsite.lbl.gov/adeline/**