

For Users of the DOE-2, PowerDOE, and SPARK Programs

THE USER NEWS

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Energy and Environment Division
Lawrence Berkeley Laboratory
University of California
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* An Update On PG&E's Energy Center

A new exhibit, "Building Performance", opened in February at Pacific Gas & Electric's Energy Center in San Francisco. "Building Performance" looks closely at the opportunities for creating high building performance and value by emphasizing two themes: high occupant comfort and low-cost operation. Educational seminars and lectures supporting this exhibit will be held at the Energy Center throughout the year. For the schedule of seminars and workshops at the Energy Center during May and June, please turn to p.6.

The Energy Center also publishes a spiffy newsletter, called *SYNERGY*, filled with articles, class and exhibit schedules, and announcements of future events. To become a subscriber, call or write the PG&E Energy Center, 851 Howard Street, San Francisco, CA 94103, phone (415) 973-7268.

* * * Keywords!! * * *

* Here's To The Next 15 Years!!

This issue marks the 15th anniversary of the User News. And although development and maintenance of the DOE-2 program is still the major focus of the Simulation Research Group, the scope of our research has been broadened to include the PowerDOE and SPARK programs. SPARK is an acronym for the the Simulation Problem Analysis and Research Kernel, an object-oriented program that builds models of complex building systems by connecting calculation modules from a library. Eventually, SPARK will be integrated into PowerDOE. Right now, we are actively working on completion of the Windows-based PowerDOE program in collaboration with Hirsch and Associates, Regional Economic Research, Inc., and Southern Company Services. The final version of PowerDOE will enable you to link with other programs currently being developed in the Building Technologies Program at LBL. You will be updated on our progress with PowerDOE and SPARK in future issues of the newsletter.

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The User News is written by members of the Simulation Research Group. Direct comments to Kathy Ellington, MS: 90-3147, Lawrence Berkeley Laboratory, Berkeley, CA 94720. Fax 486-4089, email kathy%gundog@lbl.gov

* * * **THE HEAT EXCHANGER** * * *

by

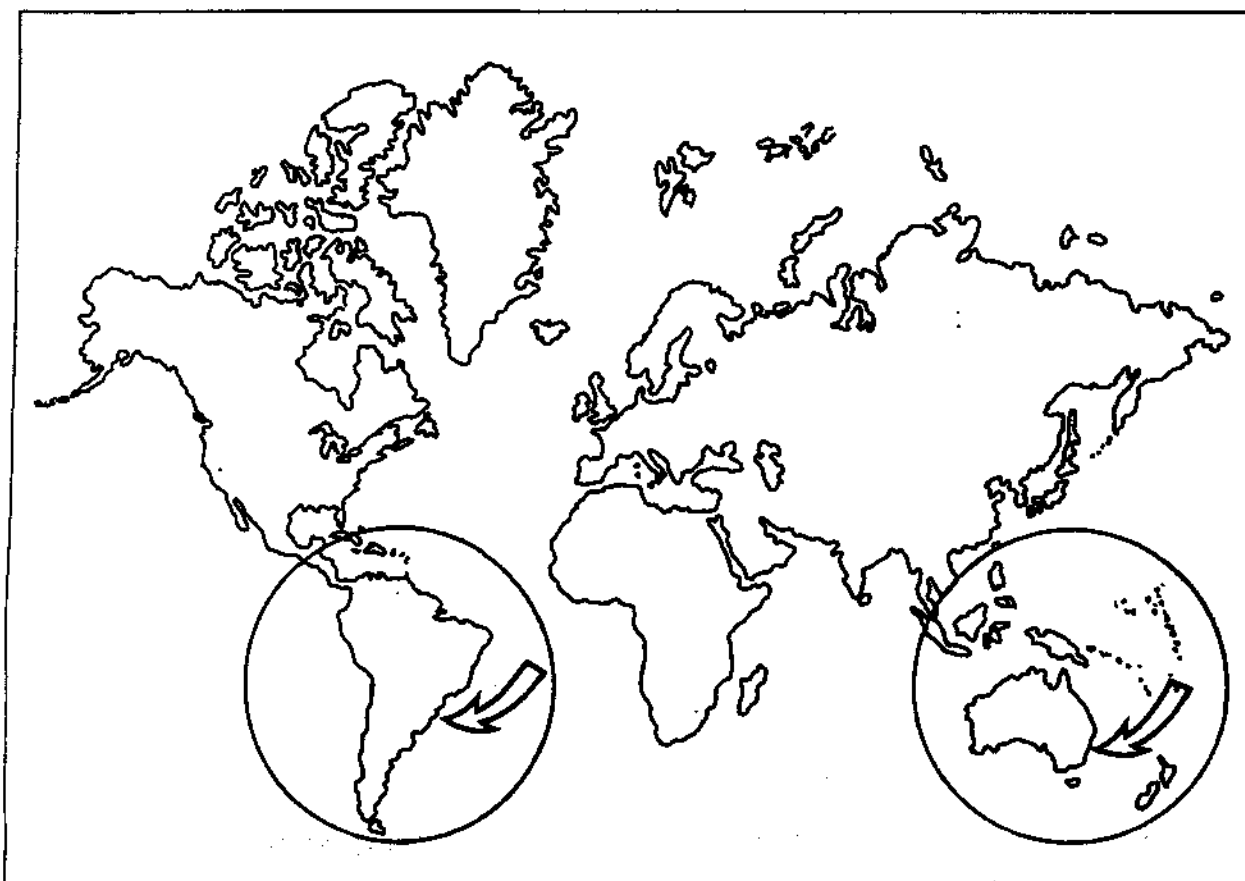
René Meldem

Question: Why is there no solar gain on my reports? I'm trying to size a system using a typical DESIGN-DAY with as many RUN-PERIODs as DESIGN-DAYs. What do I have to do to get solar gain?

Answer: If a run is made using DESIGN-DAY only, and you do not specify a RUN-PERIOD for the weather file, nor do you specify the building latitude, longitude, or time zone under BUILDING-LOCATION, then the solar gain will be zero! This is because the coordinates of the building are mandatory in order to calculate sun position and, thus, solar gain. If a RUN-PERIOD is specified using a weather file, then DOE-2 looks into the weather file for default values of latitude, longitude, and time zone and plugs them into the solar radiation calculation procedure.

DOE-2 Program Documentation		
Document	Order Number	Price
DOE-2 Basics Manual (2.1D)	DE-920-07955	44.50*
BDL Summary (2.1D)	DE-890-17726	27.00*
Sample Run Book (2.1D)	DE-890-17727	77.00*
Reference Manual (2.1A)	LBL-8706, Rev.2	126.00*
Supplement (2.1D)	DE-890-17728	61.00*
Engineers Manual (2.1A) [algorithm descriptions]	DE-830-04575	52.00*
* Prices shown are approximate; call NTIS for update. For shipments to non-U.S. addresses, double the prices listed above.		
Order from:		
National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	Phone (703) 487-4650 FAX (703) 321-8547	

Resources for International DOE-2 Users



Two recent visitors to the Simulation Research Group each expressed an interest in establishing DOE-2 "resource centers". Prof. Roberto Lamberts in Brazil and Dr. Deo Prasad in Australia have agreed to be primary contacts for program users in their respective parts of the world. So far, we have sent each resource center a copy of the new DOE-2.1E documentation and all back issues of the *User News*. When new program documentation or LBL reports pertaining to DOE-2 are published, the resource centers will receive copies. Program users can then make arrangements to get photocopies of the new material for a nominal cost. Note that Dr. Prasad is also the distributor for the WINDOW 4.1 and FRAME programs. We hope to establish more resource centers in other countries. If you are interested, please fax or email us!

South America

Prof. Roberto Lamberts
Universidade Federal de Santa Catarina
Campus Universitario--Trindade
Cx. Postal 476
88049 Florianopolis SC
BRASIL

Telephone:(55)482-31-9272
Fax:(55)482-34-1524
email: ECV1RLR@IBM.UFSC.BR

Australasia

Dr. Deo K. Prasad
SOLARCH
University of New South Wales
P.O. Box 1
Kensington, N.S.W. 2033
AUSTRALIA

Telephone: (61)-02-662-2711
Fax: (61) 02-662-4265 or -1378
email: d.prasad@unsw.edu.au

* New LBL Reports *

Two new LBL reports that used DOE-2.1D in the research are available from the Building Technologies Program. Please fax your request to Pat Ross at (510) 486-4089, and be sure to reference both the title and report number.

LBL-34648

Window U-Value Effects on Residential Cooling Load

by

R. Sullivan, K. Frost, D. Arasteh,
and S. Selkowitz

Abstract

This paper presents the results of a study investigating the effects of window U-value changes on residential cooling loads. We used the DOE-2.1D energy analysis simulation program to analyze the hourly, daily, monthly, and annual cooling loads as a function of window U-value. The performance of a prototypical single-story house was examined in three locations: hot and humid, Miami FL; hot and dry, Phoenix AZ; and a heating-dominated location with a mildly hot and humid summer, Madison WI. Our results show that when comparing windows with identical orientation, size, and shading coefficient, higher U-value windows often yield lower *annual* cooling loads, but lower U-value windows yield lower *peak* cooling loads. This occurs because the window with the higher U-value conducts more heat from inside the residence to the outside during morning and evening hours when the outside air temperature is often lower than the inside air temperature; a lower U-value window conducts less heat from outside to inside during summer afternoon peak cooling hours. The absolute effects are relatively small when compared to total annual cooling, which is typically dominated by window solar heat gain effects, latent loads, and internal loads. The U-value effect on cooling is also small when compared to both the effects of U-value and solar heat gain on heating load. Our modeling assumed that U-value and solar heat gain could be independently controlled. In fact, reducing window conductance to the levels used in this study implies adding a second glazing layer which

always reduces solar heat gain, thus reducing annual cooling. Thus, when we compare realistic options, e.g., single pane clear to double pane clear, or single pane tinted to double pane tinted, the double pane unit shows lower annual cooling, as well as lower peak periods.

LBL-35412

Developing Integrated Envelope and Lighting Systems For Commercial Buildings

by

E.S. Lee, S.E. Selkowitz, F.M. Rubinstein,
J.H. Klems, L.O. Beltran,
D.L. DiBartolomeo, and R. Sullivan

Abstract

Integrated envelope and lighting systems achieve significant energy, peak demand, and cost savings over typical component-by-component design practice by leveraging the interactive energy balance between electric lighting energy use and cooling due to lighting and solar radiation. We discuss how these savings can be achieved by using conventional glazing and lighting components by taking an integrated systems design approach. We describe integrated dynamic envelope and lighting systems, currently under development, that actively achieve this energy balance through the use of intelligent control systems. We show how prototypical daylighting systems can be used to increase the efficacy and distribution of daylight throughout the space for the same or less glazing area as a typical window, while achieving greater energy savings with increased visual comfort. Energy performance simulations and field tests conducted to date illustrate significant energy savings, peak demand reductions, and potential practical implementation of these proposed systems.

!! Announcing !!
Version 2.1E of PRC-DOE2
A PC Version of DOE-2.1E for \$495

The Partnership for Resource Conservation (PRC) is offering the latest micro-computer version of DOE-2, including two weather files and weather conversion utilities, for \$495. For a limited time, this price will also include free documentation updates (DOE21.E Supplement and BDL Summary). PRC also offers custom utility programs for creating multiple DOE-2 input files, analyzing DOE-2 output and creating monthly average and peak load shape curves. On-site training and program support are also available.

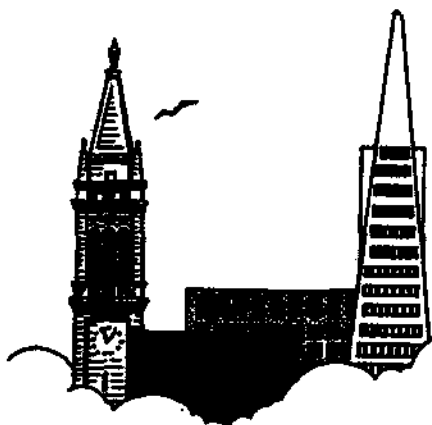
Cost of PRC-DOE2 and PRC-TOOLS, January 1994

PRC-DOE2 version 2.1E	\$495
Update Manuals: 2.1E Supplement and BDL Summary	free with PRC-DOE2 (\$100 value, limited time offer)
Custom DOE-2 tools for creating multiple runs, analyzing end-use demand and costs and creating load shapes.	\$195 - \$495 (training or phone support recommended)
DOE-2 training and support	call for information

The DOE-2 program is compiled to run on an IBM compatible 386 or 486 computer with a math co-processor installed and at least 4 Megabytes of RAM. Purchase of PRC-DOE2 includes 2 weather data files of your choice (317 North American locations); additional weather files can be purchased for \$25 each. Limited support is available for other versions of the DOE-2 program. We also provide support for specific DOE-2 projects and give training sessions in the use of PRC-DOE2 and custom utilities.

To order your DOE-2 package or for more information contact John Gehring at:

The Partnership for Resource Conservation.
 140 S. 34th Street
 Boulder, CO 80303
 voice/fax (303)499-8611
 e-mail: jgehring@aol.com



The Pacific Gas & Electric Energy Center

May and June Seminar Series

Please note that reservations are necessary for each seminar or workshop. To reserve space in a class, or for additional information about the content or speakers, call the Smarter Energy Line at 1-800-933-9555 or (415) 973-7268. The Energy Center is open Tuesday through Friday from 9:00 a.m. to 6:00 p.m.

May 10: High Efficiency Motors and Variable Frequency Drives

This half-day seminar presents detailed design information for the selection and specification of high efficiency motors and variable frequency drives. Topics include technology overview, economics, case studies, application guidelines, and power quality. Computerized economic analysis tools will be distributed.

May 19: Underfloor Air Conditioning

Underfloor air conditioning is widely used outside the U.S. but infrequently used here. The speaker will discuss construction, customer and cost concerns, indoor air quality issues, energy efficiency, and integrated system flexibility.

May 24: Chiller/Cooling Tower Retrofits

This seminar presents equipment retrofit opportunities for chilled water plants. Topics will cover plant optimization, CFCs, controls, and case studies.

May 25: Lighting Measurements and Calculations

This half-day seminar demonstrates the means and methods used in standard practice for measuring lighting system performance. It compares calculated lighting values to measured lighting values and translates these numbers to visual perception in actual spaces. Understanding photometric test reports and assumptions used in computer lighting programs will be discussed.

May 25: Visual Performance and Lighting Systems

This seminar concentrates on aspects of human performance in a workplace setting as a response to the visual environment. Illuminance levels, glare, the effects of wall finishes, and the nature of visual tasks will be discussed.

June 7: Evaporative Cooling Applications in California

This seminar presents both the principles and practical considerations for applying direct and indirect evaporative cooling in the climates of Northern and Central California.

June 16: EPACT in California

The Energy Policy Act (EPACT) has implications for energy use in commercial buildings, even in California where stringent building energy codes already exist. Under discussion will be compliance enforcement mechanisms, new limits on HVAC equipment efficiencies, and Title 24 exempt occupancies for hospitals and Federal buildings.

June 21: Architect's View of the Sun: Shading Devices

This workshop begins with a description of the relationship between the sun and architecture. Using the principles of solar motion and a graphic tool, participants will solve a shading design problem. The solutions will be analyzed on the heliodon and with pocket sundials on the roof.

Announcing WINDOW 4.1

Windows & Daylighting Group (90-3111), Building Technologies Program, Energy & Environment Division,
Lawrence Berkeley Laboratory, Berkeley, CA 94720

Summary

WINDOW 4.0, LBL's PC computer program for analyzing window thermal performance, has been updated to version 4.1. This is an announcement which describes new features for those already familiar with version 4.0. If version 4.0 is meeting your needs and you are not a part of the NFRC process, you don't necessarily need to update now. However, if you share files with other users, you should be aware that version 4.1 output files cannot be read by version 4.0. Version 4.1 can read version 4.0 files. If you update to version 4.1, you will be able to use the program exactly as you would version 4.0.

No internal program calculations have changed in version 4.1 and no significant changes have been made to the screen format. Version 4.1 looks and acts very much the same as 4.0 except that more features are available to the user. Several changes have been made to assist NFRC calculations and reports. These enhancements make the program more functional for everyone.

Here is a list of features that have been added or enhanced in WINDOW 4.1.

- ◆ Enhanced editing functions
- ◆ Multiple range library printing functions
- ◆ Expanded copy function
- ◆ Enhanced program start up
- ◆ New "Custom" window type
- ◆ New NFRC report format
- ◆ U-value display precision toggle
- ◆ Comma or tab delimited output feature
- ◆ Improved FRAME 3 file support
- ◆ Improved library functions (Alt+L)

Note to DOE-2.1E users: you can use WINDOW 4.0 and 4.1 to add custom glazings to the DOE-2 window library.

Ordering

If you are a current WINDOW 4.0 user, you need only order the one-disk update package. You will still be able to access all your existing libraries with the new version. If you are not familiar with version 4.0, or do not have the documentation for version 4.0, you should order the WINDOW 4.1 Complete Package, with a fully updated manual (available March 1994). To order the free update, fax or mail this page to:

WINDOW 4.1 Update
90-3111
Lawrence Berkeley Laboratory
Berkeley, CA 94720
FAX 510-486-4089

Check the package you want:

- WINDOW 4.1 Update Package
- WINDOW 4.1 Complete Package

Your Name:	_____
Affiliation:	_____
Address:	_____
Phone/Fax:	_____

This work was supported by the Assistant Secretary for Conservation and Renewable Energy, Office of Building Technologies, Building Systems and Materials Division of the U.S. Department of Energy under Contract No. DE-AC03-76SF-00098.

10 SECONDS PER ZONE ON PCs

by Gene Tsai, P.E.

ERG/Acrosoft International, Inc.

Following the successful conversion of DOE-2.1E to the new E Version of MICRO-DOE2™, we were thrilled by the benchmark test results. From one test sample, BENCH2.INP, we recorded a runtime of 111 seconds for an annual run of an 11-zone building from load calculations through economics analysis...10.1 seconds per zone for a complete annual run on a PC! How much faster can you ask for? I still remember benchmark tests I conducted on an IBM/XT, 4.77 MHz with 640 KB RAM in late 1986. On the average it took 22 to 25 minutes to complete a similar run. In actual dollars (no inflation adjustment), the hardware cost for a 486/66 clone today is about the same as an IBM/XT and about half of an IBM/AT eight years ago. And the 486/66 can finish a similar simulation run about 100 times faster than XT and 50 times of AT, the DOE-2 Speed/Price Index (S/P I) is about 100. What a difference eight years can make in the PC world!

The fastest time recorded to run MICRO-DOE2™ was done on a typical input on a specially configured PC. Not every BDL input on any 486 PC will run that fast. As a matter of fact, to gain some understanding of relative effectiveness, a different setup on your PC can save you a great amount of time to run the PC version of DOE-2. We tested MICRO-DOE2™

E version (an enhanced version of DOE-2, not a plain vanilla version of DOE-2) on three different PCs using two other variations of setups. One is to run on a hard disk (the traditional way) or RAM drive (memory); the other is to run with SMARTDrive installed.

Benchmark Input Samples

(1) BENCH1.INP (6 zones) is the first LOAD-SYSTEM-PLANT-ECON. from SAMP1.INP (Run 3) of DOE-2.1E input sample. (Output file size is 430 KB)

(2) BENCH2.INP (11 zones) is the first LOAD-SYSTEM-PLANT-ECON. from SAMP2.INP. (Output file size is 51 KB)

(3) BENCH3.INP (11 zones) is the first LOAD-SYSTEM-PLANT-ECON. from SAMP3.INP. (Output file size is 125 KB)

Test PCs

486/66 Desktop - a 486 clone with Norton Utility Computing Index of 98.6 and Disk Index of 8.1 (relative to IBM/XT)

486/66 Notebook - with Norton Utility Computing Index of 100.1 and Disk Index of 5.0

486/50 Desktop - a 486 clone, with Norton Utility Computing Index of 75.8 and Disk Index of 8.6

"A" TESTS: INDIVIDUAL RUNTIMES (runtime seconds per zone in parenthesis)

A.1 CASE #1- 486/66 Desktop (with SMARTDrive)

	Hard Disk (sec)	RAM Drive (sec)
1	111 (18.5)	96 (16.0)
2	131 (11.9)	111 (10.1)
3	173 (15.7)	154 (14.0)

A.2 CASE #2- 486/66 Notebook (with SMARTDrive)

	Hard Disk (sec)	RAM Drive (sec)
1	159 (26.5)	129 (21.5)
2	189 (17.2)	152 (13.8)
3	243 (22.1)	205 (18.6)

A.3 CASE #3- 486/50 Desktop (with SMARTDrive)

	Hard Disk (sec)	RAM Drive (sec)
1	185 (30.8)	155 (25.8)
2	213 (19.4)	174 (15.8)
3	274 (24.9)	233 (21.2)

A.4 CASE #4- 486/50 Desktop (no SMARTDrive)

	Hard Disk (sec)	RAM Drive (sec)
1	331 (55.2)	160 (26.7)
2	378 (34.4)	176 (16.0)
3	440 (40.0)	237 (21.5)

Much valuable information can be drawn from our test results, but I will only mention some highlights:

RAM Drive Helps

From B.1 comparison results, it shows that RAM drive can speed MICRO-DOE2™ runs 12% to 24% compared to the hard disk runs. Here, it assumes that the SMARTDrive is installed. If not, the discrepancy is large.

The Notebook PC is Slower

From B.2 comparison results, it shows that with the same 486/66 type PC, the desktop PC out-performs the notebook PC substantially. The only deficiency in the notebook PC is the Disk Index of Norton Utility, but the results show a larger discrepancy even running on the RAM drive.

Runtime Ratio Greater than PC Clock Speed Ratio

From B.3 comparison results, both desktops show that 486/66 runs 51% to 67% faster than the 486/50, which is greater than the computer clock speed difference and the Norton Utility Computing Index difference.

SMARTDrive is Effective for Runs on a Hard Disk

From B.4 comparison results, it shows that the installation of SMARTDrive makes a significant improvement in running MICRO-DOE2™ on a hard disk and makes almost no difference while running on the RAM drive.

I must confess that historically I haven't paid much attention to the computing efficiency of MICRO-DOE2™ - like many other HVAC engineers. These benchmark test results have surprised me to a certain degree. The test results should benefit users when making decisions for their next computer. The tests also demonstrate the runtime implications of different PC configurations.

“B” TESTS: DIRECT COMPARISONS

B.1 Hard Disk vs. RAM Drive

	CASE #1	CASE #2	CASE #3	CASE #4
1	111/96 =1.16	159/129=1.23	185/155=1.19	331/160=2.07
2	131/111=1.18	189/152=1.24	213/174=1.22	378/176=2.15
3	173/154=1.12	243/205=1.19	274/233=1.18	440/237=1.86

B.2 486/66 - Notebook vs. Desktop

	Hard Disk	RAM Drive
1	159/111=1.43	129/96 =1.34
2	189/131=1.44	152/111=1.37
3	243/173=1.41	205/154=1.33

B.3 Desktop 486/50 vs. 486/66

	Hard Disk (sec)	RAM Drive (sec)
1	185/111=1.67	155/96 =1.61
2	213/131=1.63	174/111=1.57
3	274/173=1.58	233/154=1.51

B.4 486/50 - Without SMARTDrive vs. With SMARTDrive

	Hard Disk	RAM Drive
1	331/185=1.79	160/155=1.03
2	378/213=1.77	176/176=1.00
3	440/274=1.61	237/237=1.00

It was nine years ago when we first saw DOE-2 running on PCs. Today we have hardware to perform “S/P I” about 100 times faster than the IBM/XT of nine years ago for DOE-2 runs on PCs. If the evolution continues linearly, nine years later, in year 2003, we might expect new PCs (model ??86) to be significantly faster than today's 486. Assuming equal cost, we might improve “S/P I” another 100 times - which is 0.1 second per zone for a complete annual simulation. Seem impossible? Maybe, maybe not. The new PENTIUM™ processor may already put us halfway there.

For information about the new MICRO-DOE2™ E version, please call or write:

ERG/Acrosoft International, Inc.
a Division of ERG International Consultants, Inc.
 1626 Cole Boulevard, Suite 250
 Golden, Colorado 80401-3306
 Tel: (303)233-4453; Fax: (303)233-4234

NOTICE

EZFRAME Version 1.00 COMPUTER PROGRAM

APPLICABLE STANDARDS:	Energy Efficiency Standards for Residential and Nonresidential Buildings
AUDIENCE:	Architects, Engineers, Contractors, Energy Consultants and Building Officials
EFFECTIVE DATE:	Immediate for EZFRAME Version 1.00
AVAILABILITY:	March 14, 1994
LEVEL OF CHANGE:	Voluntary, optional computer analysis program

SUMMARY:

The EZFRAME Version 1.00 computer program will be available on March 14, 1994, from the California Energy Commission's Publication Office. The Commission has approved this computer program for demonstrating envelope compliance with the residential and nonresidential efficiency standards. The program available from the Commission includes one diskette and the user's manual.

The EZFRAME computer program is an automated procedure for calculating overall U-values of *metal* and *wood* frame envelope assemblies. Its application is limited to light-mass construction assemblies (heat capacity < 7.0). The EZFRAME program uses the ASHRAE procedures and the Commission's required assumptions when performing the calculations. The FORM-3R/ENV3 Form printed by this program can be used for demonstrating envelope compliance with residential and nonresidential standards. For medium and high mass construction assemblies, residential FORM 3RM, "Residential Masonry Wall Assembly," or the nonresidential form ENV-3, "Proposed Masonry Wall Assembly," must be used.

Use of this program is optional. You may use the default U-values for steel and wood frame assemblies from the residential and nonresidential manuals or use this program to calculate the U-value for your specific assembly.

Approval of the EZFRAME computer program will remain effective until the envelope standards are revised in the 1998 or future cycle of standards.

To use the EZFRAME program you need the following computer equipment:

- An IBM-compatible personal computer
- A monochrome or color video monitor
- Disk Operating System (DOS) Version 4.0 or higher
- A serial or parallel port printer
- 3 1/2 inch/720k Floppy Disk Drive



CALIFORNIA ENERGY COMMISSION 1515 Ninth Street · Sacramento CA · 95814

BUILDING DEPARTMENTS:

The EZFRAME program can be used to verify the calculated U-values when the default U-value Tables for framed envelope assemblies (found in the residential and nonresidential manuals) are not used. The EZFRAME program calculates the total U-values of wood and metal framed construction assemblies with heat capacity of less than 7.0 Btu/ft²-F.

The form printed by this program (FORM-3R/ENV-3) can be used for demonstrating envelope compliance with the energy efficiency standards for both residential and nonresidential buildings. When this form is submitted, be sure to check the framing information in the "COMPONENT DESCRIPTION" and the information about the assembly layers in the "CONSTRUCTION COMPONENT" section of the form. You should verify that interior/exterior rigid insulations, air spaces and metallic layers have been modeled properly by checking the appropriate columns in the "CONSTRUCTION COMPONENT" section of the form. The inside and outside air films need not be checked because those values are determined internally in the program.

To receive a free copy of this program, please send a request on your department letterhead to the California Energy Commission's publications office.

FOR MORE INFORMATION:

Questions regarding EZFRAME may be directed to the Energy Hotline at (800) 772-3300 or (916) 654-5106, Monday through Friday, 8 a.m. to noon and 1 p.m. to 3 p.m.

ORDERING INFORMATION:

Copies of the EZFRAME program Version 1.00 (publication number P400-94-002) are available by mailing a check or money order, payable to the California Energy Commission, for \$14 per copy (includes a program diskette and a manual) to:

**California Energy Commission
Publications Office, MS-13
P.O. Box 944295
Sacramento, California 94244-2950**

To expedite your order please (1) return a completed order form with the number of copies and total cost, (2) include the enclosed mailing label with your address written or typed in the appropriate area and, (3) enclose your check or money order. Orders received without these three items will take longer to process.

PUBLICATIONS ORDER BLANK

Name _____

Organization _____

Address _____

City _____ **State** _____ **Zip** _____

				Date
PUBLICATION NUMBER	PUBLICATION TITLE	QUANTITY	UNIT PRICE	TOTAL PRICE
P400-94-002	EZFRAME Computer Program/Manual		\$14.00	
TOTAL AMOUNT ENCLOSED				

Price includes postage and handling.

<p>California Energy Commission</p> <p>Publicatons Office, MS-13</p> <p>P.O. Box 944295</p> <p>Sacramento, CA 94244-2950</p>
--

* Calendar of Meetings and Conferences *

May 19-20 — *9th Symposium on Improving Building Systems in Hot and Humid Climates*

to be held in Arlington, Texas.

Contact: Dawna Rosenkranz, Texas A&M University. Phone (409) 847-8950, Fax 862-2762.

* *

June 22-24 — *SCIBS '94*

to be held in McLean, Virginia.

Sponsors: The W-78 Commission of the International Council for Building Research Studies and Documentation and The International Federation of Associations of Computer Users in Engineering, Architecture and Related Fields.

Contact: Dr. Harold Jones, College of Continuing Education, University of Oklahoma, 1700 Asp Avenue, Box 13, Norman, OK 73037-0001. Phone (405) 325-1947, Fax (405) 325-7698.

* *

June 25-30 — *ASHRAE Annual Meeting*

to be held in Orlando, Florida.

Sponsor/Contact: ASHRAE Meetings Section, 1791 Tullie Circle N.E., Atlanta, GA 30329. Phone (404) 636-8400, Fax (404) 321-5478.

June 25-30 — *Solar '94: 23rd American Solar Energy Society Annual Conference and the 19th National Passive Solar Conference*

to be held in San Jose, California.

Contact: American Solar Energy Society, 2400 Central Avenue G-1, Boulder, CO 80301. Phone (303) 443-3130.

* *

Aug 22-24 — *CIB W78 Workshop on Computer Integrated Construction*

to be held in Espoo, Finland.

Contact: Mr. Kari Karstila, VTT Building Technology, P.O. Box 1801, FIN-02044 VTT, Finland. Phone +358-0-456 4579, Fax +358-0-456 6251, email: kari.karstila@vtt.fi

* *

Oct 9-12 — *European Simulation Symposium '94*
to be held in Istanbul, Turkey.

Contact: Philippe Geril, The Society for Computer Simulation, European Simulation Office, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

* *

Nov 30 to Dec 3 — *Solar '94*

32nd Annual Meeting of the Australian and New Zealand Solar Energy Society

Theme: *Secrets of the Sun: Developing Integrated End-Use Solutions.*

To be held in Sydney, Australia.

Contact: Dr. Deo K. Prasad, SOLARCH, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033, Australia. Fax (02) 662-1378 or -4265.

* *

Jan 15-18, 1995 — *WMC '95: SCS*

Western MultiConference

to be held in Las Vegas, Nevada.

Organized by: The Society for Computer Simulation and the University of Nevada, Las Vegas.

Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, CA 92177-7900. Phone (619) 277-3888, Fax (619) 277-3930, email: scs@sdsc.edu

* *

May 10-12, 1995 — *IAQ, Ventilation and Energy Conservation in Buildings, 2nd International Conference*

to be held in Montreal, Canada.

Contact: Fariborz Haghighat, Centre for Building Studies, Concordia University, 1455 de Maisonneuve Blvd. West, Montreal, Quebec H3G 1M6, Canada. Phone (514) 848-3200, Fax (514) 848-7965.

* * * * **DOE-2 DIRECTORY** * * * *

Program Related Software and Services *

Mainframe and Workstation Versions of DOE-2

<p>DOE-2.1D and 2.1E (Source code, executable code and documentation) For 2.1E DEC-VAX, Order #000158-DOVAX-02 For 2.1E SUN-4, Order #000158-SUN-0000 For 2.1D DEC-VAX, Order #000158-D6220-01 For a complete listing of the software available from ESTSC order their "Software Listing" catalog ESTSC-2.</p>	<p>Energy Science and Technology Software Center P.O. Box 1020 Oak Ridge, TN 37831-1020 Phone: (615) 576-2606 FAX: (615) 576-2865 Email: ESTSC@ADONIS.OSTLGOV</p>
<p>FTI-DOEv2.1E (Source code and documentation) Combined source code package for both VAX and SUN versions of DOE-2.1E. Available on most distribution formats and for most operating systems (1/4" QIC tape, TK50 tape, 3.5" floppy, etc). Note: this is the distribution package only, no executables. Complete documentation for DOE-2.1E, digitally reproduced, spiral bound, and separated into multi-volume sets. [See <i>User News</i> Vol.12, No.4, p.16 for more information]</p>	<p>Finite Technologies, Inc 821 N Street, #102 Anchorage, AK 99501 Contact: Scott Henderson Phone: (907) 272-2714 FAX: (907) 274-5379 Email: 76530,1114@compuserve.com</p>

Microcomputer Versions of DOE-2

<p>ADM-DOE2 ADM-DOE2 (DOE-2.1D) is for professional energy analysts who require a state-of-the-art simulation tool for building energy use. It performs a detailed, zone-by-zone hourly simulation and includes a wide array of modeling features that make it possible to simulate "real buildings". These capabilities offer much greater accuracy and detail than is possible with handbook methods or simplified analysis. [See <i>User News</i> Vol.7, No.2, p.6 for more information]</p>	<p>ADM Associates, Inc. 3239 Ramos Circle Sacramento, CA 95827 Contact: Marla Sullivan, Sales Alex Lekov, Support Phone: (916) 363-8383 FAX: (916) 363-1788</p>
<p>CECDOEDC (Version 1.0A) A microcomputer version of DOE-2.1D integrated with a pre- and post-processing system designed strictly for compliance use within the State of California. It generates some of the standard compliance forms as output. Order P40091009 for the CECDOEDC Program with Manuals. Order P40091010 for the DOE-2.1 California Compliance Manual. [See <i>User News</i> Vol.12, No.4, p.13 for more information]</p>	<p>Publication Office California Energy Commission P.O. Box 944295 Sacramento, CA 94244-2950</p>

* *Caveat:* We list third-party DOE-2-related products and services for the convenience of DOE-2 users, with the understanding that the Simulation Research Group does not have the resources to check the DOE-2 program adaptations and utilities for accuracy or reliability.

Microcomputer Versions of DOE-2 (continued)

<p>DOE-24/Comply-24 DOE-24 is a special DOE-2 release which is both a California-approved compliance program for the state's 1992 non-residential energy standards, and a stand-alone version of DOE-2.1E that includes a powerful yet easy-to-use input preprocessor. A demonstration program is available upon request. [See <i>User News</i> Vol.12, No.2, p.2 for more information]</p>	<p>Gabel Dodd Associates 1818 Harmon Street Berkeley, CA 94703-2416 Contact: Rosemary Howley Phone: (510) 428-0803 FAX: (510) 428-0324</p>
<p>DOE-Plus™ DOE-Plus, a complete implementation of DOE-2.1D, is used to interactively input a building description, run DOE-2, and plot graphs of simulation results. Features include interactive error checking, context-sensitive help for all DOE-2 keywords, a 3-D view of the building that can be rotated, and several useful utilities. [See <i>User News</i> Vol.11, No.4, p.4 and Vol.13, No.2, p.54 for more information]</p>	<p>ITEM Systems 1402 - 3rd Avenue, #901 Seattle, WA 98101 Contact: Steve Byrne Phone: (206) 382-1440 FAX: (206) 382-1450</p>
<p>EZDOE EZDOE is an easy-to-use PC version of DOE-2.1D. It provides full screen, "fill in the blank" data entry, dynamic error checking, context-sensitive help, mouse support, graphic reports, a 750-page user manual, extensive weather data, and comprehensive customer support. EZDOE integrates the full calculation modules of DOE-2 into a powerful, full implementation of DOE-2 on DOS-based 386 and 486 computers. [See <i>User News</i> Vol.14, No.2, p.10 and No.4, p.8-14 for more information]</p>	<p>Elite Software, Inc. P.O. Drawer 1194 Bryan, TX 77806 Contact: Bill Smith Phone: (409) 846-2340 FAX: (409) 846-4367 Email: 76070,621@compuserve.com</p>
<p>FTI-DOEv2.1E Highly optimized version of DOE-2.1E software, available for most computing systems. Current support: MSDOS and Windows 3.x, Windows NT, OS/2, RS/6000 (AIX), NeXT, SUN, UNIX (most systems). Call for platforms not listed. Documentation and weather files are available. Also FTI-DOEv2.1E source code, highly optimized and portable version; will compile for most systems. [See <i>User News</i> Vol.12, No.4, p.16 for more information]</p>	<p>Finite Technologies, Inc 821 N Street, #102 Anchorage, AK 99501 Contact: Scott Henderson Phone: (907) 272-2714 FAX: (907) 274-5379 Email: 76530,1114@compuserve.com</p>
<p>MICRO-DOE2 MICRO-DOE2 (2.1E), which runs in a DOS or Windows environment, is a widely used, reliable, and tested PC version of DOE-2. The 2.1E version includes automatic weather processing, batch file creation, and a User's Guide with instructions on how to set up a RAM drive. System requirements: 386/486 PCs with 4 MB of RAM and math co-processor. [See <i>User News</i> Vol.7, No.4, p.2, Vol.11, No.1, p.2 and Vol.15, No.1, p.8 for more information]</p>	<p>ERG/Acrosoft International, Inc. 1626 Cole Boulevard #250 Golden, CO 80401-3306 Contact: Gene Tsai, P.E. Phone: (303) 233-4453 FAX: (303) 233-4234 Email: ergi@igc.apc.org</p>
<p>PRC-DOE2 A fast, robust and up-to-date PC version of DOE-2.1E. Runs in extended memory, is compatible with any VCPI compliant memory manager and includes its own disk caching. 377 weather data files available (TMY, TRY, WYEC, CTZ) for the U.S. and Canada [See <i>User News</i> Vol.13, No.4, p.11 and Vol.15, No.1, p.5 for more information]</p>	<p>Partnership for Resource Conservation 140 South 34th Street Boulder, CO 80303 Contact: John Gehring or Paul Reeves Phone or FAX: (303) 499-8611 Email: jgehring@aol.com</p>

Pre- and Post-Processors for DOE-2

<p>DOE123 Uses Lotus 1-2-3 to graphically display DOE-2.ID output as barcharts, pie charts, and line graphs. [See <i>User News</i> Vol.10, No.3, p.5 for information]</p>	<p>Ernie Jessup 4977 Canoga Avenue Woodland Hills, CA 91364 Phone: (818) 884-3997</p>
<p>DrawBDL Graphic debugging and drawing tool for DOE-2 building geometry. DrawBDL reads your BDL input and makes a rotatable 3-D drawing of your building with walls, windows and building shades shown in different colors for easy identification. Runs on PC's under Microsoft Windows. [See <i>User News</i> Vol.14, No.1, p.5-7 and Vol.14, No.4, p.16-17 for information]</p>	<p>Joe Huang & Associates 6720 Potrero Avenue El Cerrito CA 94530 Contact: Joe Huang Phone/FAX: (510) 236-9238</p>
<p>Graphs for DOE-2 2-D, 3-D, hourly, daily, and psychrometric plots [See <i>User News</i> Vol.13, No.1, p.5 for information]</p>	<p>Energy Systems Laboratory Texas A&M University College Station, TX 77843-3123 Contact: Jeff Haberl Phone : (409) 845-6065 FAX: (409) 862-2762</p>
<p>PRC-TOOLS A set of PC programs that aids in extracting, analyzing and formatting hourly DOE-2 output. Determines energy use, demand, and cost for any number of end-uses and periods. Automatically creates 36-day load shapes. Custom programs also available. [See <i>User News</i> Vol.14, No.2, p.9 for information]</p>	<p>Partnership for Resource Conservation 140 South 34th Street Boulder, CO 80303 Contact: Paul Reeves or John Gehring Phone or FAX: (303) 499-8611</p>
<p>Pre-DOE A math pre-processor for BDL.</p>	<p>Nick Luick 19030 State Street Corona, CA 91719 Phone: (714) 278-3131</p>
<p>Prep™ Prep is a batch preprocessor that enables conditional text substitution, expression evaluation, and spawning of other programs. Prep is ideal for large parametric studies that require dozens or even thousands of DOE-2 runs.</p>	<p>ITEM Systems 1402 - 3rd Avenue, #901 Seattle, WA 98101 Contact: Steve Byrne Phone: (206) 382-1440 FAX: (206) 382-1450</p>

***** DISCLAIMER *****

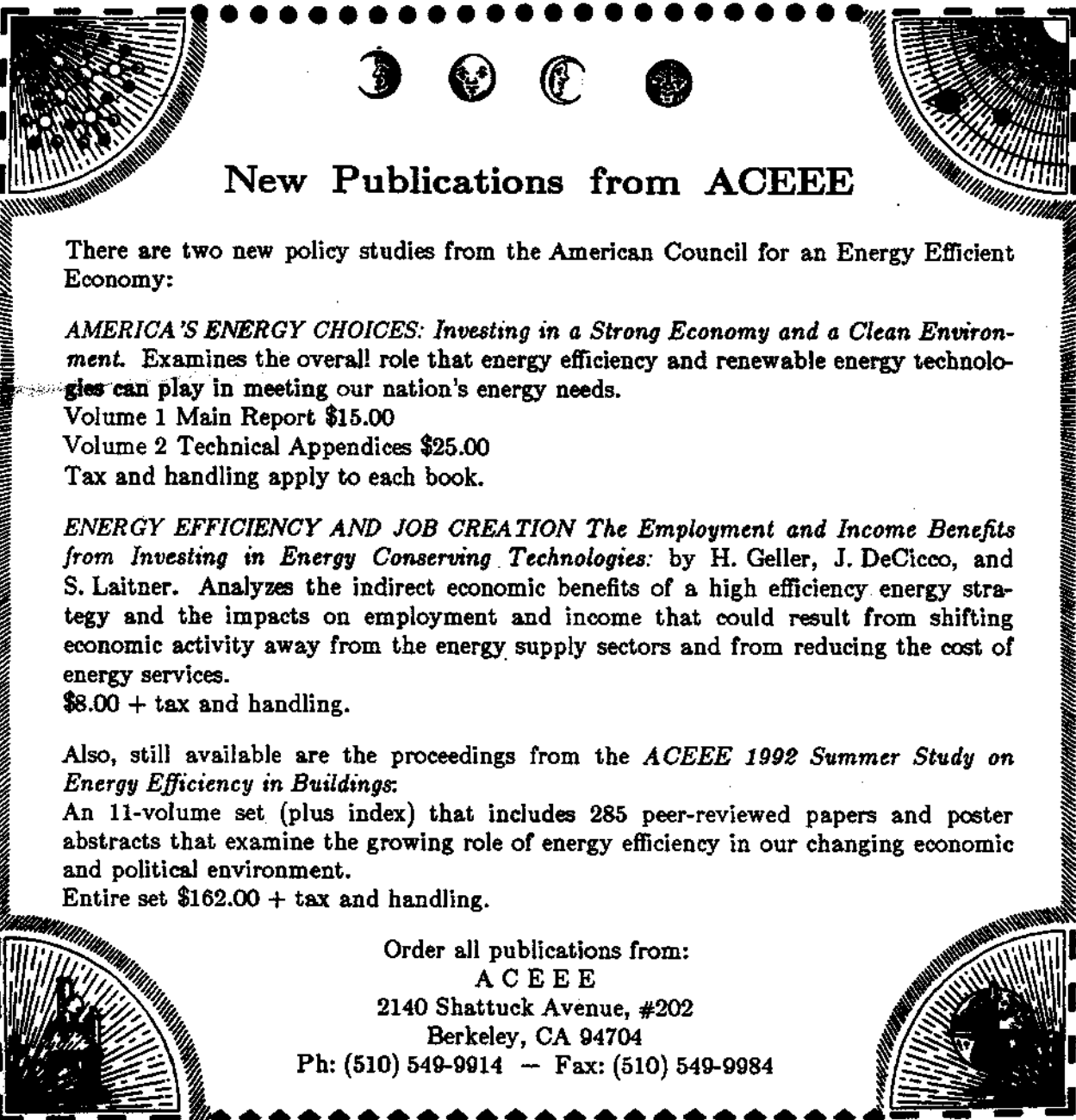
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R E S O U R C E S

<p>User News Sent without charge to DOE-2 users, the newsletter prints documentation updates and changes, bug fixes, inside tips on using the program more effectively, and articles of special interest to program users.</p> <p>Regular features include a directory of program-related software and services and an order form for documentation. In the summer issue an alphabetical listing is printed of all commands and keywords in DOE-2, and where they are found in the documentation. The winter issue features an index of articles printed in all the back issues.</p>	<p>Simulation Research Group Bldg. 90, Room 3147 Lawrence Berkeley Laboratory Berkeley, CA 94720</p> <p>Contact: Kathy Ellington Phone: (510) 486-5711 FAX: (510) 486-4089 e-mail: kathy%gundog@lbl.gov</p>
<p>Help Desk - Bruce Birdsall Call or fax our DOE-2 expert, Bruce Birdsall, if you have a question about advanced modeling techniques. If you need to fax an example of your problem to Bruce, please be sure to telephone him prior to sending the fax. This service is supported by the Simulation Research Group.</p>	<p>Bruce Birdsall Ph/Fx: (510) 829-8459 Monday through Friday 10 a.m. to 3 p.m. Pacific Time</p>
<p>DOE-2 Training DOE-2 courses for beginning and advanced users.</p>	<p>Energy Simulation Specialists 64 East Broadway, Suite 230 Tempe, AZ 85282 Contact: Marlin Addison Phone: (602) 967-5278</p>
<p>Instructional DOE-2 Video and Manual Takes you step-by-step in DOE-2.1D input preparation and output interpretation.</p>	<p>JCEM/U. Colorado Campus Box 428 Boulder, CO 80309-0428 Contact: Prof. Jan Kreider Phone: (303) 492-3915</p>
<p>Weather Tapes</p> <p>TMY (Typical Meteorological Year) TRY (Test Reference Year)</p> <p>CTZ (California Thermal Climate Zones)</p> <p>WYEC (Weather Year for Energy Calculation)</p> <p>European Weather Files</p>	<p>National Climatic Data Center Federal Building Asheville, North Carolina 28801 (704) 259-0871 climate data (704) 259-0682 main number</p> <p>California Energy Commission Bruce Maeda, MS-25 1516-9th Street Sacramento, CA 95814-5512 1-800-772-3300 Energy Hotline</p> <p>ASHRAE 1791 Tullie Circle N.E. Atlanta, GA 30329 (404) 636-8400</p> <p>Andre Dewint Alpha Pi, s.a. rue de Livourne 103/12 B-1050 BRUXELLES Belgium Phone: 32-2-649-8359 FAX: 32-2-649-9437</p>

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Mechanical Engineers Chuck Sherman Energy Simulation Specialists 64 East Broadway, Suite 230 Tempe, AZ 85282 (602) 967-5278	DSM and Energy Engineering Michael W. Harrison, P.E. Energy Resource Management, Inc. 305 West Mercury Butte, MT 59701 (406) 723-4061
Consulting Engineers Alan Cowan, P.E. Criterion Engineers 5331 SW Macadam Ave., Suite 205 Portland, OR 97201 (503) 224-8606	Hourly Calibrated DOE-2 Analysis Jeff S. Haberl Energy Systems Laboratory Texas A&M University College Station, TX 77843-3123 (409) 845-6065
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* DOE-2 ENERGY CONSULTANTS - INTERNATIONAL *	
Mainframe DOE-2 for European Users Joerg Tscherry EMPA, Section 175 8600 Dubendorf Switzerland	Space Available
Consultant Werner Gygli Informatik Energietechnik Weiherweg 19 CH-8604 Volketswil Switzerland	Consultant, Distributor for FTI-DOEv2.1E Andre Dewint rue de Livourne 103/12 B-1050 BRUXELLES Belgium



New Publications from ACEEE

There are two new policy studies from the American Council for an Energy Efficient Economy:

AMERICA'S ENERGY CHOICES: Investing in a Strong Economy and a Clean Environment. Examines the overall role that energy efficiency and renewable energy technologies can play in meeting our nation's energy needs.
 Volume 1 Main Report \$15.00
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ENERGY EFFICIENCY AND JOB CREATION The Employment and Income Benefits from Investing in Energy Conserving Technologies: by H. Geller, J. DeCicco, and S. Laitner. Analyzes the indirect economic benefits of a high efficiency energy strategy and the impacts on employment and income that could result from shifting economic activity away from the energy supply sectors and from reducing the cost of energy services.
 \$8.00 + tax and handling.

Also, still available are the proceedings from the *ACEEE 1992 Summer Study on Energy Efficiency in Buildings*.
 An 11-volume set (plus index) that includes 285 peer-reviewed papers and poster abstracts that examine the growing role of energy efficiency in our changing economic and political environment.
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Jobs Available

Testing and Monitoring

A/E and Research firm seeks professional with experience in testing of heat transfer through building assemblies, including data acquisition. Excellent opportunity for advancement. Send resume to Adrian Tuluca, Steven Winter Associates, 50 Washington Street, Norwalk, CT 06854.

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Energy conservation, DSM engineers for top notch work. Knowledge of DOE-2 required. Intermediate and management positions. Salary commensurate with experience. Send resume to Adrian Tuluca, Steven Winter Associates, 50 Washington Street, Norwalk, CT 06854.

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DOE-2 Users Group at ACEEE

If you are registered to attend the August 28 ACEEE Summer Study in Pacific Grove, CA, and want to get together with other DOE-2 users to discuss building simulation, please contact Joe Huang at LBL. Fax (510) 486-6996 or email YJHuang@lbl.gov. This meeting will only be for paid participants of ACEEE.

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