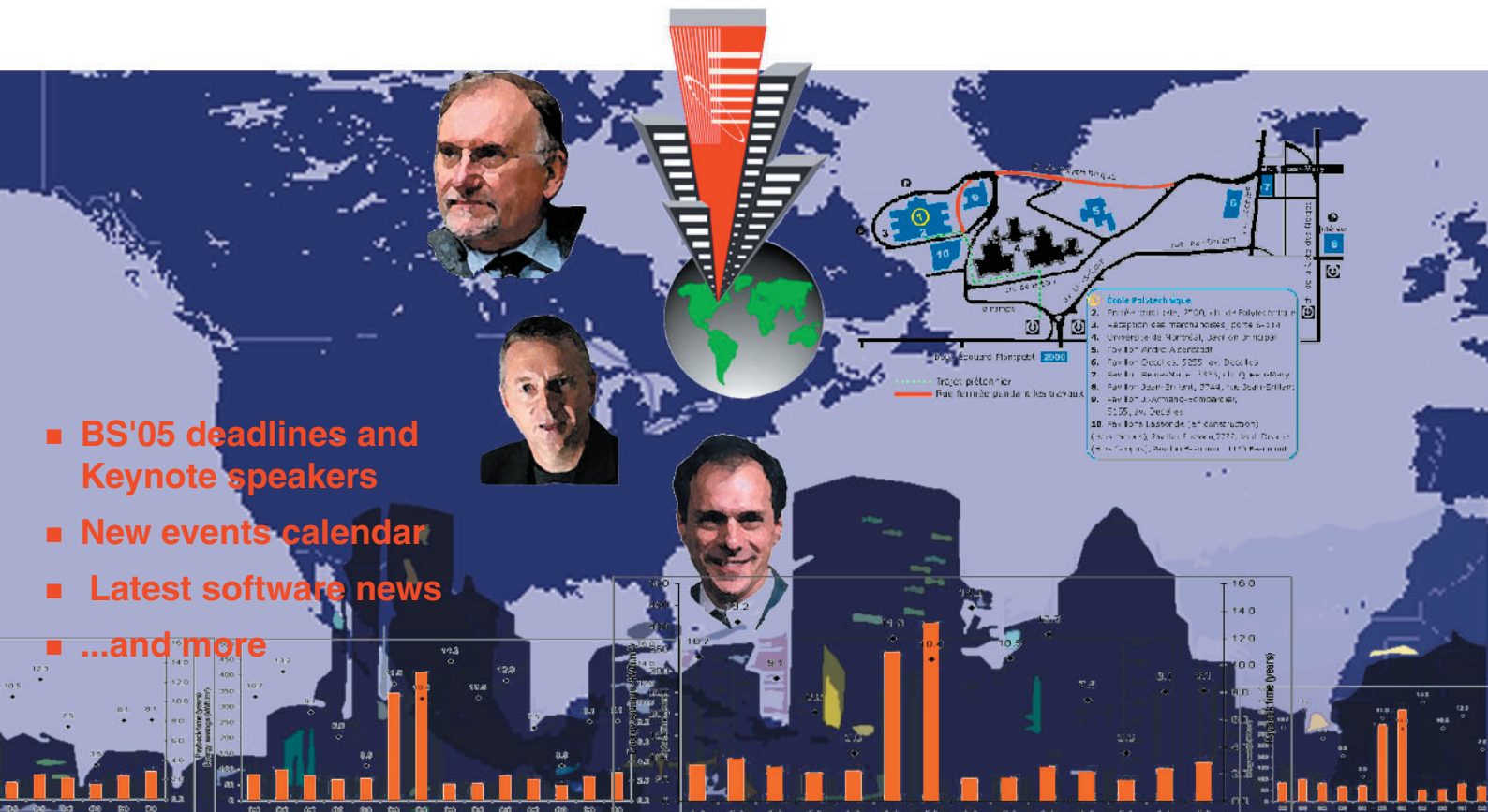


ibpsaNEWS

volume 15 number 1

April 2005



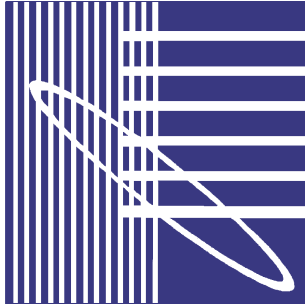
www.ibpsa.org





Contents

President's message	2
IBPSA announcements	3
Reminder - new IBPSA mailing list address	3
Getting more information about IBPSA - web links	3
IBPSA contacts	4
IBPSA Central contacts	4
IBPSA Regional affiliates	5
IBPSA Management Board	7
IBPSA Sustaining members	8
Building Simulation 2005	9
Forthcoming events calendar	11
BIM conference, Atlanta, Georgia, USA	12
VisualDOE 4.0 and LEED training seminar, San Francisco, California, USA	13
Radiance Workshop, Montréal, Canada	13
5th IASTED conference, Aruba, Caribbean	14
2005 ESM conference, Porto, Portugal	15
Software news	17
Daysim v2.1	17
EnergyPlus v1.2.2	17
COMcheck-Web	18
foAudits v2.3	19
Building Energy Tools Directory	20
Announcements	21
LBNL job opportunity	21
CSEM Research Review newsletter	22
University of Pennsylvania Building Simulation Group	23
Feature article	24
Energy performance assessment software - C Balaras, B Poel, G van Cruchten	24
News from IBPSA Affiliates	32
IBPSA-Scotland	
Seminar report - Environmental Design for Productivity	32
IBPSA-Japan	33
BS'05 exhibition information	34



**The International Building
Performance Simulation
Association**

(IBPSA) exists to advance and promote the science of building performance simulation in order to improve the design, construction, operation and maintenance of new and existing buildings worldwide.

President

Jeffrey Spitler
Oklahoma State University, USA
spitler@okstate.edu

**Vice-President and Conference
Liaison Officer**

Jan Hensen
Eindhoven University of
Technology, Netherlands
j.hensen@tue.nl

Secretary

Karel Kabele
Czech Technical University in
Prague, Czech Republic
kabele@fsv.cvut.cz

Treasurer

Charles Barnaby
Wrightsoft Corporation,
USA
cbarnaby@wrightsoft.com

Membership Services

Jeff Haberl
Texas A&M University, USA
jhaberl@esl.tamu.edu

Newsletter Chairman

Larry Degelman
Texas A&M University, USA
larry@taz.tamu.edu

Website Chairman

Karel Kabele
Czech Technical University in
Prague, Czech Republic
kabele@fsv.cvut.cz

President's message

IBPSA Members and Friends,

Two and one half years ago, I visited Montréal for the eSim 2002 conference. One of the organizers, Michel Bernier of École Polytechnique de Montréal, took Dru Crawley and myself to a restaurant serving a local specialty – smoked meat sandwiches – which we both enjoyed. To repay the favor ☺, part way through the conversation, Dru and I suggested to Michel that he and IBPSA Canada should consider hosting Building Simulation 2005. Although this was not the first thing on his mind while finishing up the eSim conference, Michel, along with Radu Zmeureanu of Concordia University and Stanislaw Kaj of École de Technologie Supérieure, quickly came up with a proposal that was accepted by the IBPSA Board.

Since September of 2002, I have been to Montréal several times, and enjoyed every visit. During the same time, the conference organizers and the scientific committee have been hard at work to ensure a great conference. A total of 233 papers have been submitted, representing a 15% increase over Building Simulation 2003. We anticipate this being the biggest IBPSA conference yet.

In order to support student travel to the conference, we are again pleased to offer student travel awards at this conference. Applications are due May 1 - see [page 10](#) for details.

The board of directors is working to finalize plans for Building Simulation 2007, and we plan to make an announcement on venue and dates prior to Building Simulation 2005. Stay tuned!

In between the international Building Simulation conferences, many of the IBPSA Regional Affiliates organize a wide range of activities, including seminars, workshops and national conferences. This newsletter contains news of local events from IBPSA Japan and IBPSA Scotland. I hope you're able to participate in some of these events.

I look forward to seeing many of you at Building Simulation 2005!

Best wishes,

ATTENTION!
For future IBPSA mail
and announcements
you need to take
action!

Important reminder! New IBPSA mailing list address

The IBPSA mail list has now been discontinued and consolidated under an existing listserver known as BLDG-SIM. BLDG-SIM is a mailing list for users of building energy simulation programs worldwide, including weather data and other software support resources. BLDG-SIM is intended to foster the development of a community of those users. Experienced and inexperienced users of building energy simulation programs are welcome and are expected to share their questions and insights about these programs. **IBPSA-related notices have now been moved to this list.** To ensure that you receive future important IBPSA and other news related to simulation announcements and discussions (including announcements of *IBPSA News* releases), please heed the following instructions so you will be included in the BLDG-SIM mail list:

To subscribe to the list,	send a blank message to: bldg-sim-subscribe@gard.com
To unsubscribe from the list,	send a blank message to: bldg-sim-unsubscribe@gard.com
To send a message to all subscribers to the list,	address your message to: bldg-sim@gard.com

Questions: If you have any questions, please contact the list owner:

Jason Glazer at jglazer@gard.com or +1-847-698-5686

This list is made possible courtesy of GARD Analytics, Inc., Ridge Park, IL, USA.

For further information about this list server, see the web page located at:

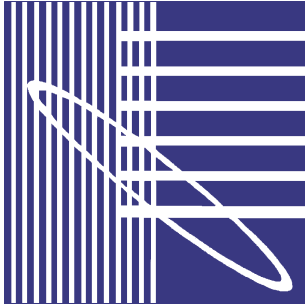
www.gard.com/ml/bldg-sim.htm

Please note there was an error in the subscribe/unsubscribe/message instructions included in the Volume 14 Number 2 issue of IBPSA News. (The @ symbol was lost in transmission!) Please ensure you follow the revised instructions above to subscribe to the list and receive automatic notification of future issues of *IBPSA News*.

Getting more information about IBPSA

Go to these web
addresses for
more information
about IBPSA!

- IBPSA's mission and structure: www.ibpsa.org/about.htm
- Conferences and publications: www.ibpsa.org/conferences.htm
- How to become an IBPSA member: www.ibpsa.org/membership.htm
- How to add yourself to the IBPSA list: www.ibpsa.org/mailing_lists.htm
- Regional affiliate contact persons: www.ibpsa.org/regional.htm
- Regional affiliate web sites: www.ibpsa.org/otherweb.htm
- Download a Word document on setting up an IBPSA Regional Affiliation: www.ibpsa.org/IBPSA-Regionalization-Guide.doc, or a PDF file: www.ibpsa.org/IBPSA-Regionalization-Guide.pdf



IBPSA Central contacts

Membership Services and Publications

For Proceedings of past IBPSA conferences contact:

Jeff Haberl (IBPSA Membership Services Officer)

Texas A&M University

Energy Systems Laboratory

College Station, TX 77843-3581 USA

Tel.: +1-979-845-6065 Fax: +1-979-862-2457

Email: jhaberl@esl.tamu.edu

Newsletter submissions

To submit Newsletter articles and announcements, contact:

Larry Degelman (Newsletter Chairman)

Texas A&M University

2206 Quail Run

College Station, TX 77845 USA

Tel.: +1-979-696-2506 Fax: +1-979-696-2506

Email: larry@taz.tamu.edu

IBPSA Building Simulation conferences

For information about IBPSA Building Simulation conferences, contact:

Jan Hensen (Vice President, Conference Liaison)

Eindhoven University of Technology

Group FAGO - HG 10.80

P.O. Box 513

5600 MB Eindhoven The Netherlands

Tel: +31 40 247 2988 Fax: +31 40 243 8595

Email: j.hensen@tue.nl

IBPSA Website

For full information on how to order IBPSA's publications, or to look at Proceedings of past IBPSA Building Simulation conferences or past IBPSA Newsletters, please look on the IBPSA Website at: www.ibpsa.org.

Long-range conference site coordination

For potential future conference hosting, contact:

Philip Haves (Conference Site Coordinator)

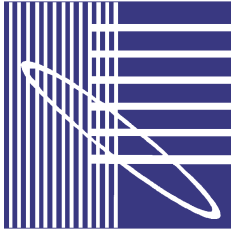
Commercial Building Systems Group

Lawrence Berkeley National Laboratory, MS 90-3111

Berkeley, CA 94720 USA

Tel: +1 510 486 6512 Fax: +1 510 486 4089

Email: phaves@lbl.gov



IBPSA Regional affiliates

For information on joining IBPSA, please contact your nearest regional affiliate. If there is no affiliate in your region, join IBPSA by using the Central membership form, available at www.ibpsa.org/membership.htm.

IBPSA-Australasia:

Veronica Soebarto

The University of Adelaide
Department of Architecture
Adelaide, SA 5005 Australia
Tel.: +618-8303-5695
Fax: +618-8303-4377
Email: veronica@arch.adelaide.edu.au

IBPSA-France:

Gilles LeFebvre

LAMI (ENPC-LCPC)
6 av. Blaise Pascal F-77455
Marne la Vallée, CEDEX 2 France
Tel.: +33-1-64-15-37-49
Fax: +33-1-64-15-37-41
Email: gilles.lefebvre@univ-paris12.fr

IBPSA-Brazil

Roberto Lamberts

Building Research Center
Department of Civil Engineering
Universidade Federal de Santa Catarina
Campus Universitário - CTC / ECV
88040-900 Florianópolis - SC Brazil
Fax: +55 48 331-5182
Email: lamberts@ecv.ufsc.br

IBPSA-Greece:

Constantinos Balaras

National Observatory of Athens
Institute for Environmental Research &
Sustainable Development
I. Metaxa & Vas. Pavlou
GR 152 36 Palea Penteli Greece
Tel: +30-210-8109152
Fax: +30-210-8103236
Email: costas@meteo.noa.gr

IBPSA-Canada:

Radu Zmeureanu

Centre for Building Studies
Department of Building, Civil and
Environmental Engineering
Concordia University
Montreal, Quebec, H3G 1M8 Canada
Tel: +1-514-848-3203
Fax: +1-514-848-7965
Email: zmeur@cbs-engr.concordia.ca

IBPSA-Ireland:

Ken Beattie

Dublin Institute of Technology
Faculty of Engineering
Bolton Street
Dublin 1 Ireland
Tel: +353-1-402-3822
Email: ken.beattie@dit.ie

IBPSA-Czech Republic:

Frantisek Drkal

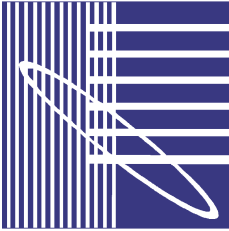
Czech Technical University in Prague
Department of Environmental
Engineering
Technicka 4
166 07 Prague 6 Czech Republic
Tel.: +42-2-2435-2480
Fax: +42-2-2435-5616
Email: drkal@fsid.cvut.cz

IBPSA-Japan:

Harunori Yoshida

Department of Global Environment
Engineering
Graduate School of Engineering
Kyoto University
Sakyo-ku, Kyoto, 606-8501 Japan
Tel: +81-75-753-5746
Fax: +81-75-753-5748
Email: nori@archi.kyoto-u.ac.jp

(continued on next page)



IBPSA Regional affiliates (continued)

IBPSA- Nederland+Vlaanderen:

Jan Hensen

Knowledge Center Building & Systems TNO-TU/e

Technische Universiteit Eindhoven, HG 10.80

P.O. Box 513

5600 MB Eindhoven

Netherlands

Tel: +31 40 247 2988

Fax: +31 40 243 8595

Email: j.hensen@tue.nl

IBPSA-Scotland: *IBPSA-Scotland handles all UK membership applications*

Lori McElroy

Sustainability Development Manager

The Lighthouse Trust

56 Mitchell Street

Glasgow G1 3LX

UK

Tel: +44 141 225 8429

Fax: +44 141 221 6395

Email: lori.mcelroy@thelighthouse.co.uk

IBPSA-Slovakia:

Jozef Hraska

Slovak University of Technology,

Radlinskeho 11, Bratislava

Slovak Republic

Tel: +421-2-59274 458

Fax: +421-2-52920 482

Email: hraska@svf.stuba.sk

IBPSA-USA:

Chip Barnaby

Wrightsoft Corp.

394 Lowell St., Suite 12

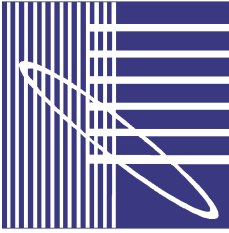
Lexington, MA 02420

USA

Tel: +1-781-862-8719, Ext 118

Fax: +1-781-861-2058

Email: cbarnaby@wrightsoft.com



IBPSA Management Board

Jeff Spitler (President), Oklahoma State University, USA
Email: spitler@okstate.edu

Jan Hensen (Vice Pres., Conf. Liaison), Eindhoven University of Technology
Email: j.hensen@tue.nl

Karel Kabele (Secretary), Czech Technical University in Prague, Czech Republic
Email: kabele@fsv.cvut.cz

Charles “Chip” Barnaby (Treasurer.), Wrightsoft Corp., USA
Email: cbarnaby@wrightsoft.com

Roger Pelletret (Past President), CSTB, France
Email: pelletret@cstb.fr

Godfried Augenbroe (At-Large), Georgia Tech University, USA
Email: godfried.augenbroe@arch.gatech.edu

Drury Crawley (At-Large), U.S. Department of Energy
Email: Drury.Crawley@ee.doe.gov

Ian Beausoleil-Morrison (At-Large), Natural Resources-Canada
Email: ibeausol@nrcan.gc.ca

Jonathan Wright (At-Large), Loughborough University, UK
Email: j.a.wright@lboro.ac.uk

IBPSA Sustaining Members

Sustaining members of IBPSA are those individuals or organizations that provide financial support to IBPSA at the level of US\$500 or more per year. To learn about sustaining membership, please contact one of the IBPSA officers shown in this newsletter.



U.S. Department of Energy (DOE)
Washington, DC, USA

Environmental Design Solutions Limited (EDSL)
Milton Keynes, U.K.



Center for Building & Systems TNO
Eindhoven, The Netherlands

Technische Universiteit Eindhoven, TU/e
Eindhoven, The Netherlands



Dutch Society for Building Systems (TVVL)
Amersfoort, The Netherlands

Association for Computerisation in Building
and Installation Technology (VABI)
The Netherlands



Building Simulation 2005



www.ibpsa.ca/bs2005

15-18 August 2005
École Polytechnique de
Montréal

Building Simulation 2005 9th IBPSA CONFERENCE + EXHIBITION 15 - 18 August 2005 Montréal, Canada

Preparations for the 9th IBPSA Conference and Exhibition are well underway. Some 230 papers are currently being reviewed under the supervision of Ian Beausoleil-Morrison, chair of the scientific committee.

Following are some key announcements concerning keynote speakers, the IBPSA student travel award, the exhibition, and software demo sessions.

CONFIRMED KEYNOTE SPEAKERS

Kevin R. Hydes

President and CEO, Keen Engineering, P.Eng., P.E.,
C.Eng., LEED AP

Chairman US Green Building Council and Founder
Canada Green Building Council

Green Buildings...A Common Language



Professor Sanford A. Klein

Bascom-Ouweneel Professor of Mechanical
Engineering, University of Wisconsin – Madison

**Energy Issues: Demand, Supply, and
Opportunities for Increased Efficiency**

Professor Michael Holmes

Consultant to Arup Research+Development and
Royal Academy of Engineering Visiting Professor
of Design to the Department of Civil and Building
Engineering at Loughborough University (UK).

Winner of the 2003 Outstanding practice award
-IBPSA

Simulation - The Future - An Industrial Vision



DEADLINE!
**The deadline for
student travel award
applications is
1 May 2005!**



DEADLINE!
**The deadline for
renting an exhibition
space or submitting
software is
15 April 2005!**

IBPSA Student Travel Awards– Building Simulation 2005

IBPSA will grant up to five travel awards for students presenting papers at Building Simulation 2005. Each award may be up to 1,000 \$US. The selection committee will base its decisions upon the following selection criteria:

- Quality of the paper.
- Need for financial assistance, as indicated in a letter of recommendation from the faculty supervisor/advisor (the letter must be on university letterhead).

To be eligible:

- The student must be enrolled in a graduate programme related to building simulation, AND
- The thesis project must be directly related to building simulation.

For more details consult the web site at: http://ibpsa.ca/bs2005/student_awards.htm

Call for Exhibitors – Building Simulation 2005

Potential exhibitors are kindly invited to play an active role in this conference by participating in the exhibition which will be held from 9.00am to 5.00pm on 16 and 17 August 2005. The exhibition is an excellent opportunity for any institution or company to present building performance simulation products or services to the conference participants.

The exhibition will allow your company to meet participants on an individual basis. As an exhibitor you will also have the opportunity to present your software before a larger audience in the software demo sessions (see below and <http://ibpsa.ca/bs2005/software.asp>)

Booth costs and contact information are **provided here (page 34)** in PDF format. The deadline for renting a space at the exhibition is 15 April 2005.

Software Demo Submission – Building Simulation 2005

Software companies and individuals are invited to take part in special software demo sessions. Much like technical presentations, the software demo sessions will consist of presentations in front of an audience. However, these presentations will not be peer-reviewed and therefore not included in the conference proceedings. (Although the submission of a technical paper on the software that meets one of the conference themes is encouraged.)

To be eligible for a presentation during the software demo sessions, the software must be a commercial product or be freely available (on a web site for example). In addition, the presenter must be a registered participant. For more details consult the Building Simulation web site (<http://ibpsa.ca/bs2005/software.asp>)

Deadline for submitting your software: 15 April 2005

Forthcoming events calendar

Date(s)	Event	Information
19-20 Apr 2005	Conference on Building Information Modeling at Georgia Tech, Atlanta	GaTechModelingLink (www.pe.gatech.edu/conted/servlet/edu.gatech.conted.course.ViewCourseDetails?COURSE_ID=624)
20-22 Apr 2005	VisualDOE 4.0 and LEED training in San Francisco	www.archenergy.com/products/visualdoe/training/
22 Apr 2005	Healthy Workplaces Conference, Glasgow	www.rias.org.uk
30 May – 2 June 2005	IEA Heat Pump Conference in Las Vegas	Oak Ridge National Lab, www.ornl.gov/hp2005
25-29 June 2005	ASHRAE annual meeting, Denver	www.ashrae.org
11-12 Aug 2005	4 th annual Radiance workshop in Montreal	http://irc.nrc-cnrc.gc.ca/ie/light/RadianceWorkshop2005
15-18 Aug 2005	Building Simulation '05 in Montreal	www.ibpsa.ca/bs2005/
29-31 Aug 2005	5th IASTED Int'l Conference, Aruba (MSO 2005)	www.iasted.org/conferences/2005/aruba/mso.htm
30-31 Aug 2005	IIR Int'l. Conf. on Commercial Refrig. in Vicenza, Italy	www.aicarr.it/vicenza2005
4-9 Sept 2005	Indoor Air 2005 in Beijing	www.indoorair2005.org.cn
14-18 Sept 2005	Bangkok RHVAC 2005	www.thaitradefair.com/fairin/rhvac05/information.htm
20-23 Sept 2005	FEBRAVA Int'l. HVAC Fair in Sao Paulo, Brazil	www.febrava.com.br
27-29 Sept 2005	2005 World Sustainable Bldg Conf. in Tokyo	www.sb05.com/homeE.html
6-20 Oct 2005	EPBD National Calculation Method, Strathclyde, Glasgow	Iain Macdonald (iain@sesg.strath.ac.uk)
9-12 Oct 2005	Clima 2005 in Lausanne, SZ	www.ashrae.org/clima2005
24-26 Oct 2005	ESM2005, European Simulation and Modeling Conf. in Porto, Portugal	http://biomath.rug.ac.be/~eurosis/conf/esm/esm2005/
2-4 Nov 2005	IKK 2005 Int'l HVAC Trade Fair in Hanover, Germany	www.ikk-online.com/
9-11 Nov 2005	Greenbuild Int'l. Conference, Atlanta	www.greenbuildexpo.org
30 Nov – 2 Dec 2005	Int'l Congress of HVAC&R in Belgrade, Yugoslavia	Branislav Todorovic at todorob@eunet.yu
21-26 Jan 2006	ASHRAE Winter Meeting in Chicago	www.ashrae.org

BS'05

**Other events
detailed in this
newsletter**

19-20 April 2005
Atlanta, Georgia, USA

[www.pe.gatech.edu/conted/servlet/
edu.gatechconted.course.ViewCourse
Details?COURSE_ID=624](http://www.pe.gatech.edu/conted/servlet/edu.gatechconted.course.ViewCourseDetails?COURSE_ID=624)



Conference on Building Information Modeling (BIM): Challenges, Opportunities, Processes, Deployment

Georgia Tech College of Architecture/The Laiserin Letter

Georgia Tech College of Architecture (COA) PhD Program and the LaiserinLetter™ technology advisory service are jointly organizing and hosting this conference which will be held at the Global Learning and Conference Center on the campus of Georgia Tech in Atlanta on 19-20 April 2005. The conference aim is to explore the challenges and opportunities of BIM, as well as the processes necessary for its successful deployment, and will include real-world case studies and interactive panels, together with industry applications and analyses of interest to building owners, operators, constructors or designers.

The conference will examine the ways that BIM “offers fundamentally new opportunities for improving the quality of design, shortening the building procurement life cycle, and reducing costs,” according to Charles Eastman, director of the COA PhD program and author of *Building Product Models*. Both public and private building owners are beginning to recognize these benefits. A key confirmation of this trend is the US General Services Administration’s (GSA) requirement for a BIM approach at the concept design phase of all projects starting in fiscal year 2006 (which begins October 2005). Notes Eastman, “the issue no longer is why or when to adopt BIM, but how to effectively deploy it now.”

LaiserinLetter™ editor Jerry Laiserin, founding director of the aecXML project for industry data exchange and widely credited with standardizing and popularizing the terminology of BIM, observes that “the multi-dimensional, data-rich models of the BIM approach enable contractors, engineers, architects and building product manufacturers to work as a tightly integrated team helping owner-operators build smarter.” Case study and application presentations at the conference illustrating such teamwork include BIM for Steel Construction, BIM for Precast Concrete Construction, BIM for Energy Analysis, BIM for Project Delivery and BIM for Industry Integration, as well as BIM for Owners. Panel presentations include leading providers of technology solutions in each of these areas.

Audience registration information and the conference agenda are available on the web at www.pe.gatech.edu/conted/servlet/edu.gatechconted.course.ViewCourseDetails?COURSE_ID=624 or by contacting Mrs. Mercedes Saghini at mercedes.saghini@coa.gatech.edu, phone +1 (404) 894-3476. Sponsorship information, for vendors of qualified technology solutions, may be obtained by contacting Jerry Laiserin at gategchbim@laiserin.com, phone +1 (917) 225-7058.

20-22 April 2005
San Francisco, California, USA
www.archenergy.com/products/visualdoe/training/



VisualDOE 4.0 and LEED training seminar
Architectural Energy Corporation

Architectural Energy Corporation is pleased to announce a VisualDOE 4.0 and LEED training seminar on 20-22 April 2005 in San Francisco.

The seminar includes two days focused on DOE-2.1E, the VisualDOE interface, VisualDOE 4.0 new features, and general energy simulation skills. The third day covers LEED energy savings calculations for green buildings. The LEED module covers LEED-NC 2.1 as well as proposed calculation methods for LEED-NC 2.2.

No prior energy modeling experience is required, but a good understanding of building systems is very helpful.

VisualDOE 4.0 is available at a discount to training attendees. However a free one-month license for VisualDOE 4.0 is included with the training.

An advanced training program for experienced VisualDOE users is being considered on 25 and 26 April 2005 in San Francisco. This program will cover advanced topics of DOE-2.1E, VisualDOE 4.0, and simulation skills for complicated energy conservation measures. If you are interested in the advanced training program, please contact the training team as soon as possible. Email queries to vdoetraining@archenergy.com or phone (415) 957-1977 ext 111. To register or get more training information, please go to www.archenergy.com/products/visualdoe/training/

VisualDOE Training Team
Architectural Energy Corporation
142 Minna Street, Second Floor
San Francisco, CA 94105
Voice: (415) 957-1977
Fax: (415) 957-1381
Email: vdoetraining@archenergy.com
Web: www.visualdoe.com

August 2005
Montréal, Canada
<http://irc.nrc-cnrc.gc.ca/ie/light/RadianceWorkshop2005>

Radiance Workshop 2005
Greg Ward and Christoph Reinhart

Greg Ward and Christoph Reinhart are organizing this year's Radiance workshop at McGill University in Montréal in the week preceding BS2005. The purpose of the workshop is to provide design practitioners, researchers, and educators with an opportunity to present their work with the Radiance lighting simulation software, and to share ideas and solutions with other attendees. Participants are invited to give a talk, which will be limited to 30 minutes (~20 minute for the talk followed by ~10 minutes of open discussion). Radiance users of all levels are welcome.

For up to date information see:
<http://irc.nrc-cnrc.gc.ca/ie/light/RadianceWorkshop2005>

29-31 August 2005
Oranjestad, Aruba, Caribbean
www.iasted.org/conferences/2005/aruba/mso.htm



ATTENTION!
Initial paper submissions (6 pages) must be received by the extended deadline of 15 April!

5th IASTED International conference on Modelling, Simulation and Optimization (MSO 2005)

International Association of Science and Technology for Development

The Fifth IASTED International Conference on Modelling, Simulation, and Optimization (MSO 2005) will be held from 29-31 August 2005 in tropical Oranjestad, Aruba. This conference aims to create an international forum for researchers and practitioners interested in advances in, and applications of, modelling, simulation and optimization. It will include a special session titled "Building energy simulations", and the organizers are actively seeking papers from participants with research interests in this topic.

The beautiful island of Aruba lies at the heart of the southern Caribbean, just off the northern coast of South America (Venezuela) and about two-and-a-half hours by air from Miami, Florida. This Caribbean island, one of the Lesser Antilles islands, is only 20 miles long, yet features a diverse landscape. The waters off the east coast are rough, and rolling with breakers, and the coastline is dotted with caves, dunes, and desert landscapes as well as world-famous natural rock bridges. The west coast boasts smooth, sandy beaches, lush flora, and vibrant underwater life in clear, azure waters. Oranjestad, Aruba's capital city, is located on the picturesque southern coast and its unique architecture blends historical Dutch influences with Aruban sloping roofs and airy courtyards.

For further information on the conference, please contact:



Prof. Milorad Bojic,
BEng, MSci, DrTechSci, MASHRAE
Faculty of Mechanical Engineering
University of Kragujevac
Sestre Janjic 6
34000 Kragujevac
Serbia and Montenegro
Tel.Fax.+381-34-330196
Email: bojic@kg.ac.yu

Please note that the deadline for receipt of initial submissions (6 pages) is 15 April 2005

24-26 October 2005

Porto, Portugal

<http://biomath.rug.ac.be/~eurosis/conf/esm/esm2005/>



2005 European Simulation and Modelling conference

Eurosis/ Ghent University

The 2005 European Simulation and Modelling conference (ESM'2005) will be held in Porto, Portugal, on 24-26 October 2005, hosted by the University of Porto.

ESM'2005 is the new international conference concerned with state of the art technology in modelling and simulation. It aims to provide an overview of academic research in the field of computer simulation. A number of major themes of simulation research will be presented, together with specific workshops which capture the art and science of present-day simulation research.

CALL FOR PAPERS!
Abstract submissions, 15 June - 15 July 2005

All submissions will be peer reviewed by three members of the International Program Committee. Accepted papers will be published in the conference Proceedings (both print and electronic format on the web), which will be copyrighted and widely disseminated. All talks and tutorials must be accompanied by a paper of three to eight Proceedings pages.

TOPICS

- Methodology and Tools
- Simulation and AI
- High Performance and Large Scale Computing
- Simulation in Education and Graphics Visualization Simulation
- Simulation in the Environment, Ecology, Biology and Medicine
- Analytical and Numerical Modelling Techniques
- Web Based Simulation
- Agent Based Simulation
- Workshop Simulation with Petri Nets
- Modelling and Simulation with Bondgraphs
- DEVS Workshop
- Fluid Flow Simulation Modelling Workshop
- SIMULA Workshop

TUTORIALS

Tutorials can be proposed in the following three categories:

- T1- Introductory tutorials
- T2- State of the Art Tutorials
- T3- Software and Modelware Tutorials

Tutorial proposals should be emailed to:

Philippe.Geril@biomath.ugent.be

POSTER SESSION

The poster session only features work in progress. In addition to the actual poster presentation, these submissions also feature as short papers in the Proceedings.



STUDENTS SESSION

This session is for students who want to present their work in progress or part of their doctoral thesis as a paper. Student papers are denoted by the fact that only the name of the student appears on the paper as an author. They are published as short papers in the Proceedings.

EXHIBITION

A special exhibition will be held during the conference focused on simulation tools.

For more information please contact EUROSIS for further details:

Email: **Philippe.Geril@biomath.ugent.be**

DEADLINES AND REQUIREMENTS

Send all submissions in ELECTRONIC FORM ONLY in uuencoded, zipped Microsoft Word format, PDF or Postscript format indicating the designated track and type of submission (full paper or an extended abstract) to EUROSIS:

Philippe.Geril@biomath.ugent.be

Please provide your name, affiliation, full mailing address, telephone / fax number and email address on all submissions as well. For submissions please put in the subject of your email the following indications: ESM2005 and designated track or USE THE ABSTRACT SUBMISSION PAGE!! Only original papers which have not been published elsewhere will be accepted for publication.

REGISTRATION FEES

	Authors	EUROSIS Members	Other Participants
Pre-registration before October 1	485 € (EURO)	485 € (EURO)	545 € (EURO)
Registration after October 1	Pre-registration required	545 € (EURO)	595 € (EURO)

The registration fee includes one copy of the Conference Proceedings, coffee and tea during the breaks, all lunches, a welcome cocktail and a conference dinner.

For additional information on venue and paper submission types and styles, please contact:

Philippe Geril

Ghent University

Ghent-Zwijnaarde, Belgium

Email: **philippe.geril@biomath.ugent.be**



For up to date information see:

www.eurosis.org or **<http://biomath.rug.ac.be/~eurosis/conf/esm/esm2005/>**

Software news



National Research
Council Canada



Fraunhofer
Institut
Solare Energiesysteme

www.daysim.com

Daysim 2.1 now online

Christoph Reinhart, National Research Council Canada

The National Research Council Canada and the Fraunhofer Institute for Solar Energy Systems have released version 2.1 of the Daysim daylighting analysis tool. Daysim is based on LBNL's Radiance software and combines the Perez sky model with a daylight coefficient approach to effectively predict the annual daylight availability (daylight factor and daylight autonomy) in buildings for multiple sites worldwide (you can import EnergyPlus epw climate files).

Daysim further features a user behavior model which allows users to compare electric lighting use for manual and automated controls (occupancy sensor, photocell control).

The software runs under Windows and Linux OS and can be downloaded from www.daysim.com



www.energyplus.gov

EnergyPlus Version 1.2.2 Available April 2005

Drury Crawley, US Department of Energy

The latest release of the EnergyPlus building energy simulation program, Version 1.2.2, becomes available in late April 2005. In addition to many new features, we have updated and extended capabilities throughout the existing building envelope, daylighting, and HVAC equipment and systems portions of the program. Some of the new features include:

INPUT

- Schedule data can now be read from an external file
- New dataset for commercial customer utility tariffs
- System convergence limits now allow the user to set minimum system time step and maximum HVAC iterations (can significantly reduce execution time)
- Example input files for all new features (More than 200 example files available)
- More than 100 new international weather locations including data for Italy and China in the EnergyPlus/ESP-r weather format (more than 800 locations available worldwide)

GEOMETRY/WINDOWS/WALLS/SHADING

- New special case of heat transfer surfaces—Exterior Vented Cavity— allows modeling of ventilated photovoltaic roof paver and other cladding systems

ZONE MODEL

- New room air model for natural cross ventilation (coupled to COMIS)

HVAC

- Simplified definition of HVAC implemented—Compact HVAC allows user to specify a generic system type which is then automatically expanded into the traditional branches and nodes
- Refrigerated cases and associated compressor racks
- Variable speed cooling tower model with user-selectable performance based on CoolTools, YorkCalc or user-defined coefficients

ON-SITE ENERGY SUPPLY

- Transpired solar air collectors

ENVIRONMENTAL IMPACTS

- Source energy factors can vary using a schedule
- Title 24 Time Dependent Valuation (TDV) factor schedules in Datasets

OUTPUT

- Heating and cooling loads and energy due to ventilation can now be reported

UTILITIES

- IDF Editor – all file size limits removed, multiple objects can be copied and pasted, autosize is now a default where available
- Weather converter – supports TMY3 (SWERA) and custom, user-definable formats

Input/Output Reference and Engineering Reference have been updated and extended for all new features and updates, bringing total documentation to more than 2000 pages, and there are many other enhancements and speed improvements throughout.

More information on these and other new features in this version is available on the EnergyPlus web site: www.energyplus.gov.



[http://energycode.pnl.gov/
COMcheckWeb/](http://energycode.pnl.gov/COMcheckWeb/)

COMcheck-Web new software release

Krishnan Gowri, Pacific Northwest National Lab

Pacific Northwest National Lab announces the release of COMcheck-Web, a web-based program for demonstrating commercial energy code compliance based on ASHRAE 90.1, IECC and several state codes. It performs just like the COMcheck-EZ desktop software, but avoids the need to download or install any software on your computer. Additional features include pdf report generation and e-mail options with building permit information.

Users can save their data on the Building Energy Codes web server and access it from anywhere with an internet connection. Please note that COMcheck-Web does not yet support Lighting Allowances or Mechanical compliance.

COMcheck-Web can be accessed from:

<http://energycode.pnl.gov/COMcheckWeb/>



Fundamental Objects, Inc.
www.foaudits.com

foAudits v. 2.3 Released

Bill Shadish, Fundamental Objects, Inc

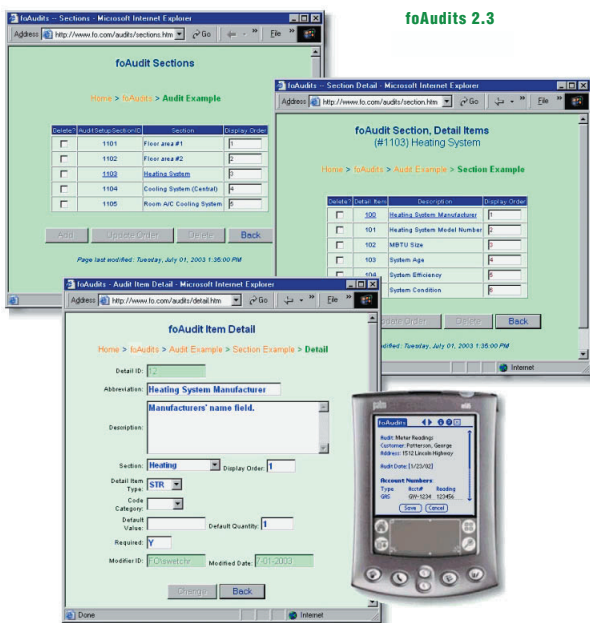
Fundamental Objects Inc has just announced a new release of its handheld and web-based energy audits software foAudits. foAudits (www.foaudits.com) provides a framework to handle energy audits, inspections and surveys for the Palm OS, Pocket PC and various phones. The foAudits toolset includes a completely online option, including data storage, entry of audit information and audit maintenance.

New features included in version 2.3 of foAudits include:

- Enhanced security.
- Enhanced compression routines (for transmitting data).
- Increased Pocket PC performance.
- Additional field types supported:
 - pop-up tooltip-like help.
 - linked lists.
 - very large lists.
 - enhanced customer signatures.

foAudits forms can be accessed:

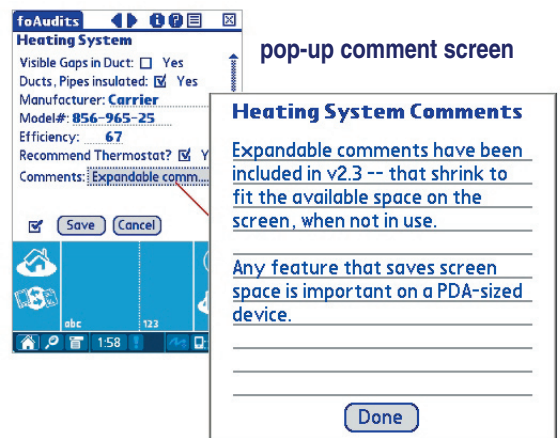
- via internet browser,
 - Internet Explorer, versions 4 and 6.
 - Netscape, versions 4, 6 and 7.
 - FireFox version 1.0.
- with Palm OS PDAs using a wireless or hotsync (connected) interface,
- from Pocket PC PDAs with a wireless or activesync (connected) interface,
- and from Tablet PCs, with a wireless interface.



For more information, see
www.fo.com/p-050304.htm or contact

Bill Shadish
Principal
Fundamental Objects, Inc.
<http://www.foaudits.com>
610.873.8022
610.873.8772 fax

Free PDA Newsletters are available from
www.fo.com/newsletters



Building Energy Software Tools Directory

www.energytoolsdirectory.gov

Building Energy Tools Directory

Drury Crawley, US Department of Energy

The web-based Building Energy Tools Directory at www.energytoolsdirectory.gov contains information on more than 295 building-related software tools from around the world. Haven't visited lately? A number of new tools have been added over the last several months including: Room Air Conditioner Cost Estimator, Unitary Air Conditioner Cost Estimator, Tetti FV, Design Advisor, SunAngle Professional Suite, and Daylight.

For each tool in the directory, a short description is provided along with information about technical expertise required, users, audience, input, output, validation, computer platforms, programming language, strengths, weaknesses, technical contact, availability and cost. A link is also provided for directly translating the web pages into more than 8 languages.

If you know of a tool (yours?) that isn't in the directory, visit www.energytoolsdirectory.gov/your_software_here.html or contact Dru Crawley at: Drury.Crawley@ee.doe.gov.

Announcements

Job opportunity - Lawrence Berkeley National Laboratory

Group Leader, Building Simulation Research Group

Join LBNL as Leader of the Building Simulation Research Group (Computational Staff Scientist/Program Manager III # EE/017753)

Responsibilities

Berkeley Lab's Environmental Energy Technologies Division seeks an experienced professional to lead the research and development activities of the Simulation Research Group <http://gundog.lbl.gov> within the Building Technologies Department. This building science modeling group is developer or co-developer of widely used building energy analysis software tools, including EnergyPlus, DOE-2, SPARK, and GenOpt and this is an opportunity to help define and implement the next generation of advanced energy simulation tools to enhance the design and operation of energy efficient buildings.

As a member of the national EnergyPlus team, you will guide current EnergyPlus development; define, prioritize and implement new modeling capabilities in future versions of EnergyPlus; maintain quality assurance, and enhance deployment of the tools. We'll rely on you to develop and coordinate overall group technical contributions, personally contribute to the addition of new EnergyPlus calculation features, and work with other groups to coordinate tool development activity, extend EnergyPlus applicability to include building operations as well as design and analysis, identify new cross-cutting simulation-based initiatives and seek funding for new projects. You will also supervise maintenance and support of new and existing tools, play an active role in key technical, scientific and professional societies, represent the work of the group and results in a variety of technical and professional forums, and publish technical results in peer-reviewed journals.

Additional duties include working with the DOE Program Manager to update annual operating plans and the DOE multiyear program plan, obtaining outside sources of funding, working with procurement to subcontract tasks, technically managing the subcontracts and overseeing financial management of the group activities.

Requirements

Requirements include an advanced degree or equivalent experience in Computational Science, Engineering, Architectural Engineering or related building science field and 3+ years experience in developing mathematical models for state-of-the-art building energy simulation models, preferably in the HVAC area, and implementing these models in computer code. Demonstrated experience with management of successful software

Announcements

development efforts, including quality assurance and documentation of computer code for building energy analysis, strong working knowledge of one or more programming language, preferably Fortran90 and/or C/C++, and excellent project management, financial, administrative, communication and presentation skills are also necessary. Experience in one or more areas of architectural and/or engineering practice, building design process, building controls, facilities operations and management is preferred.

For consideration, submit a letter of interest and resumé to, Lawrence Berkeley National Laboratory, MS 937-600, 1 Cyclotron Road, Berkeley CA 94720, email to sdjobs@lbl.gov or fax to (510) 486-5870. When applying, please reference EE/017753/code. Lawrence Berkeley National Laboratory is an Affirmative Action/Equal Opportunity Employer committed to the development of a diverse workforce.

For additional information on other job responsibilities and application details, log onto the LBNL web site at: <http://gundog.lbl.gov> and click on Group Leader Position Available (http://gundog.lbl.gov/grp_ldr.html) at the top of the left column.



CSEM Research Review

The Center for the Study of Energy Markets (CSEM) publishes a semi-annual newsletter (called RESEARCH review) that summarizes recent CSEM Working Papers in lay person terms and discusses the policy implications of the research. The goal is to facilitate access to CSEM research and communicate the policy relevance of the research.

To read the latest edition, visit the UCEI web site (www.ucei.berkeley.edu) and click on the RESEARCH review, CSEM Newsletter icon under 'What's New'. You can find earlier editions by clicking on the Energy Markets (CSEM) tab and then on 'CSEM Newsletter'.

Articles in the Spring 2005 issue:

- Is Real-time Pricing Good for the Environment?
- Coal Emissions Regulation a Windfall for Railroads
- Do Competitive Energy Markets Make Rising Energy Prices Worse for Poor Consumers?

To subscribe to Research Review go to the webpage (www.ucei.berkeley.edu), click on the Working Papers tab and then on 'Subscribe to Mailing Lists'.

Please send any comments or suggestions on the Newsletter to ucei@berkeley.edu.

Introducing Penn's Building Simulation Group



www.gsfa.upenn.edu/bsg/

The Building Simulation Group (BSG) is a research organization within the School of Design at the University of Pennsylvania in Philadelphia, Pennsylvania, USA. It is affiliated with several entities including the Center for Human Modeling and Simulation (HMS): www.hms.upenn.edu/. The group is composed of faculty, associated experts, visiting scholars and students. Doctoral and graduate students engage in collaborative research efforts with ongoing research and consulting projects. The group was founded in 2001 by Ali Malkawi, Associate Professor and Head of the BSG. The goal of the group is to develop, investigate, and utilize in practice computational models and techniques for building simulation. The BSG addresses broad research issues including inference mechanisms; simulations of airflow, thermal, and lighting systems; process-driven interoperability tools; decision support systems; and interface development such as Augmented Reality (AR).

Research and consulting capabilities include:

- Building Simulation: Thermal, lighting, airflow and structural analysis, combining both physical and computational simulations.
- Building Visualization: Virtual and Augmented Reality visualizations of simulated data.
- Data Interaction: Gesture and speech recognitions to manipulate data objects interactively.
- Tools Integration and Optimization: Performance-based tools for building simulation using numerical optimization techniques.

Examples of the consulting projects undertaken by BSG include:

- energy audits and analysis at several sites for the National Park Service;
- double-skin thermal behavioral studies;
- daylighting studies including Ferrari Engineering Facility and Fiat Engineering showcase factories in Italy;
- design and planning for technology parks;
- dynamic visualization of streetscapes, and
- large scale projects for clients such as the city of Miami in Florida.

The BSG has developed a live AR-CFD (Computational Fluid Dynamics) studio at its lab for interactive immersive visualization of CFD data of built environments. Currently this studio includes DataVisor's stereo Head-Mounted-Device (HMD), Ascension Technology's MotionStar motion capture system, Flock of Birds with Six Degrees-of-Freedom sensors, and Immersion Corporation's CyberGloves. An interactive speech and gesture-based immersive AR model to visualize and interact with buildings and their thermal environments has been developed by BSG: www.gsfa.upenn.edu/bsg/hbifinal/.

InnovativeInsight, a monthly electronic newsletter of recent news and information regarding building simulation and related topics, is compiled, edited and distributed by the BSG. To receive a free electronic version of InnovativeInsight, send email to simulation@design.upenn.edu.

The group is supported through research projects, consultancy services and membership fees. Members are provided access to the group's databases, research outcomes and discounts for its consulting services. For more information, contact Ali Malkawi at: malkawi@design.upenn.edu, or visit the BSG website at www.gsfa.upenn.edu/bsg/.

Feature article

Software for energy performance assessment of existing dwellings*

C. A. Balaras¹, B. Poel² and G. van Cruchten²

¹ Group Energy Conservation, Institute for Environmental Research & Sustainable Development, National Observatory of Greece, I. Metaxa & Vas. Pavlou, GR 152 36 P. Penteli, Greece. Tel: +30 210 8109152, Fax: +30 210 8103236, Email: costas@meteo.noa.gr

² EBM-consult bv, P.O. Box 694, 6800 AR Arnhem, The Netherlands. Tel: +31 26 3537272, Fax: +31 26 3511713, Email: bpoel@ebm-consult.nl

ABSTRACT

The existing buildings stock in European countries accounts for over 40% of final energy consumption in the European Union (EU) member states, of which residential use represents 63% of total energy consumption in the buildings sector. Consequently, an increase of building energy performance can constitute an important instrument in the efforts to alleviate the EU energy import dependency (currently at about 48%) and comply with the Kyoto Protocol to reduce carbon dioxide emissions. This is also in accordance with the European Directive (2002/91/EC) on the energy performance of buildings, which is currently under consideration in all EU member states. The Energy Performance Assessment for Existing Dwellings (EPA-ED) is a new methodology, including software, developed in the framework of a European project for assessing the energy performance of existing European dwellings, stimulating the rational use of energy and the use of renewable energy sources. This paper reviews the EPA-ED method and software for performing building energy audits, demand and savings calculations in-line with the Energy Performance Certificates for existing dwellings and presents the results from the pilot studies performed in Austria, Denmark, Hellas and The Netherlands.

INTRODUCTION

The new European Directive on the Energy Performance of Buildings – EPBD [1] mandates that all European Union (EU) member states take appropriate measures for energy efficient buildings. The existing European building stock, estimated at 150 million dwellings, is ageing rapidly, whereas only around 2 million dwellings are built every year. About 70% of the residential buildings are over 30 years old and about 35% are more than 50 years old. This is an important observation given that most

This is an expanded version of a paper previously presented at the 35th HVAC Congress, 1-3 December 2004 in Belgrade, Serbia

national building regulations that mandate thermal insulation of building envelopes were introduced after the 1970's following the energy crisis. With regard to the ageing technical installations, it is estimated that about 10 million residential boilers are older than 20 years old, and thus have a significantly lower thermal performance than today's common units.

Accordingly, the real challenge for the effective implementation of the EPBD is to properly retrofit existing buildings in a manner that will use the minimum non-renewable energy, produce minimum air pollution as a result of the building operating systems, minimize construction waste, all with acceptable investment and operating costs, while improving the indoor environment for comfort, health and safety.

The refurbishment or retrofit of existing buildings can play a determinant role in the effort to reduce the energy consumption in the building sector that currently represents about 35-40% of the final energy use and about a third of greenhouse gas emissions of which about two-thirds is in residential and one-third in commercial buildings [2]. Annual energy consumption in residential buildings averages 150-230 kWh/m². In eastern and central Europe the energy consumption for heating purposes is in the order of 250-400 kWh/m², often averaging about 2-3 times higher than that of similar buildings in Western Europe. In northern European countries, well-insulated buildings have an annual consumption of 120-150 kWh/m², while the so-called low energy buildings may even drop down to 60-80 kWh/m²

Several efforts have been made from EU members States to develop methodologies and software tools in order to enable architects and engineers during their decision-making process for building refurbishment, to make an accurate first assessment of a building's existing structural condition, energy performance, indoor environmental quality, and some other criteria depending on the use of the building, with a good estimate of the total cost for refurbishment. For example, EPIQR & INVESTIMMO for apartment buildings, TOBUS for offices and XENIOS for hotels [3].

A new methodology on the Energy Performance Assessment for Existing Dwellings (EPA-ED) was recently completed in the framework of an Altener project. The EPA-ED software focuses on energy related issues and is suitable for issuing an Energy Performance Certificate. It is based on a set of tools that enable the consultants to audit and assess a dwelling or an entire building in a uniform way. The consultant is then supported to provide owners with specific advice for measures that can improve the energy performance of the dwelling or building. The prototype software was used for a number of pilots performed in four European countries. A brief overview of the methodology and the software and a summary of the results from the pilots are presented in the following sections.

THE EPA-ED METHOD

The EPA-ED methodology conceptualized and developed the strategic, organizational, and technological framework to deliver a model for assessing the energy performance of existing dwellings, for stimulating the rational use of energy (RUE) and the use of renewable energy sources (RES). The developed method provides various tools and

software for addressing the needs of both policy makers and consultants with respect to the mandates of the EPBD for existing dwellings. Apart from this the results include: benchmarking of European conditions related to existing dwellings, a strategic plan for stimulating RUE and RES through a uniform Energy Performance Assessment method, the needs for new policies, and dissemination activities on European and national levels.

The main goal was to develop a systematic approach and suitable tools compiled in software for the energy performance assessment of a building. However, there is no standardized process since this depends on the specific conditions and the building type. Nevertheless, some stages are common in the majority of the assessment processes although each stage has specific characteristics (Figure 1). They all start with an intake/inspection phase, including an interview with the client, in order to discuss and define strategies and conditions to be taken into account during the assessment, and an inspection (audit) of the building and its installations to collect the input data necessary to perform the energy analysis and establish the energy performance based on cost-effective energy saving measures.

Stages	Result
Contracting	Contract
Intake	Project approach: planning, necessary data (sources), etc
Inspection	Data (building and systems, use, other aspects)
Calculation and Analysis	Insight in energy performance and saving measures
Report	Energy Performance Certificate
Presentation of results	Satisfied client (taking measures, if appropriate)

Figure 1. Overall scheme of the EPA-ED procedure

The EPA-ED consultants inspect the dwellings, calculate the energy performance and advise the owners on possible improvements. To achieve these goals, the consultant is provided with several tools including:

- (1) Intake / Inspection form: a list of all the required input data, which is completed during the inspection. The collected data is closely related to the input parameters of the calculation tool.
- (2) Guidelines for inspection: a protocol that describes how the necessary input data is determined in a practical way, tuned to existing dwellings. It gives a definition of the input parameters that can be standardized, used in the follow-up calculations, and a number of other aspects that the consultant should pay special attention to.

- (3) Calculation (software) tool: according to the EPBD, the energy performance calculation addresses the following: architecture (position and orientation, solar protection), building envelope thermal characteristics, heating installations, hot water production, air conditioning installations, ventilation, passive solar systems, natural ventilation, and indoor climatic conditions.

The EPA-ED software

The EPA-ED software enables the user to:

- perform a calculation of the energy requirement for space heating and cooling, along with domestic hot water consumption;
- document the energy consumption;.
- create scenarios to assess different energy conservation measures and calculate the pay-back time of the investments

The EPA-ED software is currently available as an international prototype tool (version 1.4.10.30) and consists of a calculation engine and a user interface for handling input and output. The calculation engine incorporates algorithms based on available European standards. The prEN 13790 (Thermal performance of buildings – Calculation of energy use for space heating) constitutes the main source for the formulae used, simplified or modified to meet the needs of existing buildings. Where formulae for existing buildings were absent or unsuitable, these were defined based on existing (and validated) models from other sources or average national values from libraries accessible through the user interface. In anticipation of new EN standards this work was simplified as much as possible. CEN is working on the final elaboration of over 30 new standards to satisfy the requirements of the EPBD. The various algorithms are independently linked to the user interface. This way, future adaptations to meet national requirements or new norms that become available can be easily integrated in the software. Some of the software's algorithms were checked against BESTEST and the entire methodology and software was verified for its applicability through a pilot campaign in the participating countries (refer to the following section for the results of the pilot studies).

The input parameters vary from a description of the dwelling to weather data and investment costs, derived from country specific data. The user can also modify the input in the software interface, which is specified in the software libraries. Currently, national libraries are available for Austria, Denmark, Hellas and The Netherlands. The user interface of the EPA-ED software consists of: Main window (define the actual energy consumption from various sources, and climatic data), Dwelling (define general input data, i.e. heated floor area, internal heat gains, ventilation), Thermal envelope (define opaque constructions and glazings using libraries, unheated spaces etc), Passive solar systems (define geometries and construction of sunspaces, etc), Installations (define HVAC equipment using libraries), Active solar systems (define solar collectors, PVs using libraries).

The user can create and assess different renovation scenarios by modifying the dwelling's thermal envelope elements (constructions, glazing), the installations or the passive and active solar systems. The calculation scheme proceeds as follows:

- First, the existing situation is described and the energy consumption is calculated.
- Then, the building is adapted by applying a number of measures. This leads to a revised building description and a new calculated energy consumption.
- Next, the savings are calculated as the difference in energy consumption between the current and the revised situation.
- The costs of the measures are calculated in a separate calculation.
- The results of the calculations are integrated to calculate the pay back time.

The EPA-ED software output tables (Figure 2) include:

- (1) Energy consumption: calculated monthly energy consumption for heating and cooling
- (2) Heating, Cooling and Domestic Hot Water: calculated energy demand
- (3) Summary: calculated savings (fuel consumption, electricity, CO₂ emissions, Energy Indicator) and cost (investment cost, payback period).

	Unit	Actual	Hellenic_01	Hellenic_02
Savings				
-		Consumption	Consumption	Savings
+1 Fuel oil	m3	6.3	6.6	1.9
2 Electricity	kWh	5845.0		
3 CO2 Emission	kg/year		18180	5224
4 Energy Indicator	GJ/m²		0.632	0.451
5 Frac. renewable energy (no pas	-		0.000	0.067
6 Frac. renewable energy (passiv	-		0.195	0.235
7 Risk of overheating	-		High	High

	Unit	/unit	Hellenic_01	Hellenic_02
Total			1991	572
+1 Fuel oil	m3	301.00	1991	572
2 Electricity	kWh	0.10		
3 Investment Cost				1938
4 Pay Back Time, simple	Years			3.39
5 Pay Back Time, net present val	Years			0.00

Figure 2.. EPA-ED software savings (results) screen

PILOT STUDIES

Pilot studies following the EPA-ED methodology were performed in Austria, Denmark, Hellas (Greece) and The Netherlands. The goal of these pilots was to provide useful insight information about the intake/inspection process and the software, collect feedback on the time required by the consultants to complete the entire process, assess the reliability of the calculations, evaluate the practical value of the results to the building owners and identify any necessary adjustments to the prototype for the different countries. The six pilots were carried out in different age houses, dwellings and apartment buildings, representative of the national typologies.

Several problems and possible interventions were identified based on the information collected during the audit, the interaction with the occupants and analysis of the available data. The first step was to evaluate all the different interventions independently. In a following step, selected individual actions were combined and evaluated together to obtain the corresponding cumulative results that provide a global overview of their impact on improving the building's energy performance (Figure 3). Emphasis was placed on elaborating the practical aspects of the results with the client. The time required to perform the inspection and complete the process varied from two to four days, depending on the size of the building and availability of the necessary input data.

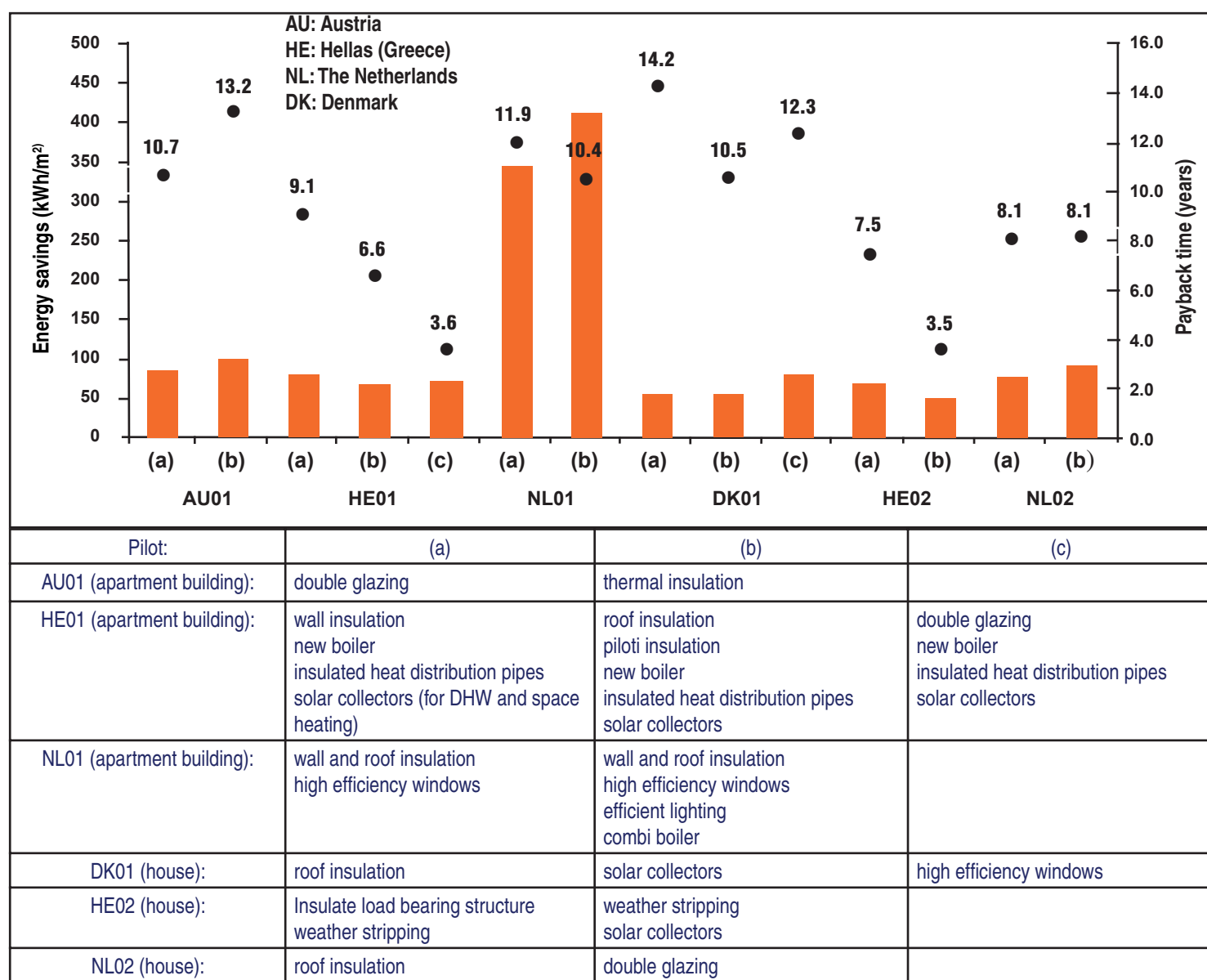


Figure 3. Energy savings (bars in kWh/m²) and payback time (bullets in years) of the different scenarios evaluated with the EPA-ED software during the pilots, in Austria, Hellas (Greece), The Netherlands and Denmark. The first three pilots correspond to apartment buildings and the last three to houses.

The intake/inspection process and use of the software was successfully implemented by third parties, not directly involved in the development, in order to provide an unbiased assessment of the overall approach and software. The results were also positively evaluated by building owners. No major adjustments to the prototype software were necessary to account for the different national characteristics.

CONCLUSIONS

The new EPA-ED (Energy Performance Assessment of Existing Dwellings) method includes software and tools addressing the needs of both policy makers and consultants with respect to Energy Performance Certificates for existing dwellings, in line with the European EPBD. The work underway in all EU member states to comply with this Directive can benefit by adopting the EPA-ED methodology and software to bring into force the necessary laws, regulations, administrative provisions, and practical tools.

The main results [4] include:

- For POLICY MAKERS: a **benchmark report** describing the status and context of the existing dwelling stock, penetration of energy saving measures and actual policies, housing market and actors, energy market, buildings and installation technologies in Denmark, the Netherlands, Austria and Greece. A **report on new policies** presenting the framework of policies, actors and stakeholders that EPBD is to be implemented in, to support on-going efforts throughout the European Union. Various **national brochures** that describe how EPA-ED can affect Energy Performance Assessment at national level. **Thematic brochures** cover some specific issues like a short description of the method, issues regarding energy labelling and the process of energy performance assessment.
- For CONSULTANTS and RESEARCHERS there is a **guide** describing the EPA-ED method. More detailed information on how to apply the method in the market is described in the **report on application strategies**. To aid the consultant during the process a **checklist** for performing the building audit and collecting the necessary input, complemented by an **inspection protocol** that presents information and guidance about adequate data acquisition. The **EPA-ED software** is a beta version, which focuses on energy related issues and is suitable for issuing an Energy Performance Certificate for an existing dwelling. It supports the consultant throughout the process of collecting the necessary data, the building audit, calculations and analysis of different energy conservation scenarios. The consultant can then provide owners with specific advice for measures that can improve the energy performance of the dwelling or building. The interface of the tool can be easily adapted to meet national requirements, while the calculation engine can be modified to include new European norms as they become available. The EPA-ED method and prototype software were successfully used for a number of pilots performed in four European countries. Follow-up work is currently underway to prepare a suitable methodology and new software for non-residential buildings in the framework of another European project in the “Intelligent Energy – Europe” Programme (IEE) of the European Commission, called Energy Performance Assessment for Existing Non-Residential buildings (www.epa-nr.org).

ACKNOWLEDGEMENTS

This work was performed in the course of the European Altener project EPA-ED. The project was co-ordinated by EBM-Consult BV, NL. The participating organizations were: Danish Building and Urban Research, Denmark; EBM-Consult BV, The Netherlands; National Observatory of Athens, Hellas; OOI Austrian Institute for Applied Technology, Austria; OTB Research Institute for Housing, Urban and Mobility Studies, TU Delft, The Netherlands. More information about EPA-ED, including all results, reports and the software, is available through www.epa-ed.org.

REFERENCES

- [1] European Union (2002). *On the Energy Performance of Buildings. Directive 2002/91/EC of the European Parliament and of the Council, Official Journal of the European Communities, December.*
 - [2] European Commission (2000). *Green Paper - Towards a European strategy for the security of energy supply. Commission of the European Communities, COM(2000)769, 29 November, Brussels, Belgium.*
 - [3] C.A. Balaras (2003). *Software for building refurbishment, The Journal of the International Building Performance Simulation Association - IBPSA, Vol. 13, No 2, p. 31-37, October.*
 - [4] www.epa-ed.org . *All project reports can be downloaded from the EPA-ED web site. Upon request, the software will be sent to you by the co-ordinator.*
-

News from Affiliates

IBPSA-Scotland

Iain Macdonald, Scottish Energy Systems Group (IBPSA-Scotland), Glasgow

Seminar report - Environmental Design for Productivity

*Full contact information
for IBPSA-Scotland is
on page 6*



IBPSA Scotland, locally known as the Scottish Energy Systems Group (SESG), in conjunction with the UK's Network for Comfort and Energy Use in Buildings, has recently held a seminar in Glasgow on the subject of environmental design for productivity. The event took place on 3 March and was attended by around 40 academics and practitioners from the UK and further afield. In all there were eight presentations covering projects from field studies to computational methods.

The day started with an overview by David Stribling (Buro Happold) of CFD and its use in aiding building design, crucially for both mechanically and naturally ventilated buildings. This was followed by Denis Bourgeois (Université Laval, Canada) presenting his framework for modelling occupant behaviour and their interactions with building systems, for example: coordinating the simulation of operable windows, lights, blinds, local air conditioning equipment. The first session was concluded with a presentation by Arjen Raue (Raue IEQ, Netherlands) on new Dutch guidelines for assessing adaptive comfort in free running buildings. This provoked a discussion, which is still running: what temperature is too hot for building occupants? It was agreed that while respondents did not perceive temperatures in the mid to upper 20s (degrees C) as uncomfortable, there could be a serious downturn in productivity (potentially as everyone makes more trips to the water cooler). Sukumar Natarajan (Manchester University) then presented possible approaches to specifying design criteria for adaptive comfort and how this might affect the content of the next edition of the CIBSE guide A.

In the afternoon two presentations covered the subject of temperatures in dwellings. The issue of excess deaths due to overheating in summer and winter was highlighted. Tadj Oreszczyn, (UCL) reported that in winter thermally improved dwellings (draught stripping and central heating) generally showed an increase in temperatures and corresponding decrease in relative humidity, coupled with a reduction in bills, as would be expected. In addition this resulted in various health benefits for the occupants including significant improvements in their mental health, for example due to reduced worries about the reliability of old heating systems. Dusan Fiala (De Montfort University) presented findings from measurements taken during the European heatwave in August 2003, which resulted in 35,000 extra deaths. The data showed that heat related deaths increased when the average daily temperature rose above 19°C.

The seminar ended with two student presentations covering more issues related to the performance of free running buildings in summer. Paul Tuohy (ESRU) discussed



the effect of thermal mass within buildings under different usage patterns and in different climate zones, showing that there is no single best approach to the problem of designing low energy comfortable buildings. Finally, a possible method for deciding refurbishment strategies was presented by Stuart Barlow (De Montfort University and Reid Architecture) although the method is still being refined by use on real projects.

Overall, participants found the day highly rewarding and thoroughly enjoyed their visit to Glasgow. The next meeting of the NCEUB network will be held in Bath, further details at <http://learn.unl.ac.uk/pmwiki/> and future SESG events are advertised at www.sesg.strath.ac.uk.



*Full contact information
for IBPSA-Japan is on
page 5*

IBPSA-Japan

Yasuo Utsumi, Institutes of National Colleges of Technology, Japan

IBPSA-Japan activities for branch members are organized by the executive committee of the Japan branch; recent events and publications have included:

1. Combined meetings with other organizations, e.g. the heat transfer working group of the Architectural Institute of Japan
2. The IBPSA-Japan newsletter, Vol. 3, No. 1, in January 2005
3. The IBPSA-Japan annual conference, held in Tokyo on January 22nd 2005.

The annual conference consisted of two parts, for administrative issues and for technical sessions, and had 62 participants. The theme of the conference was 'Environment Simulation of Architecture and Cities' and 40 papers including 27 reviewed ones were presented in oral presentations or posters. The presentations provoked lively discussion and the papers have since been published.

