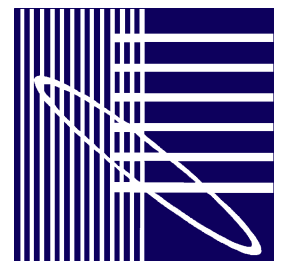
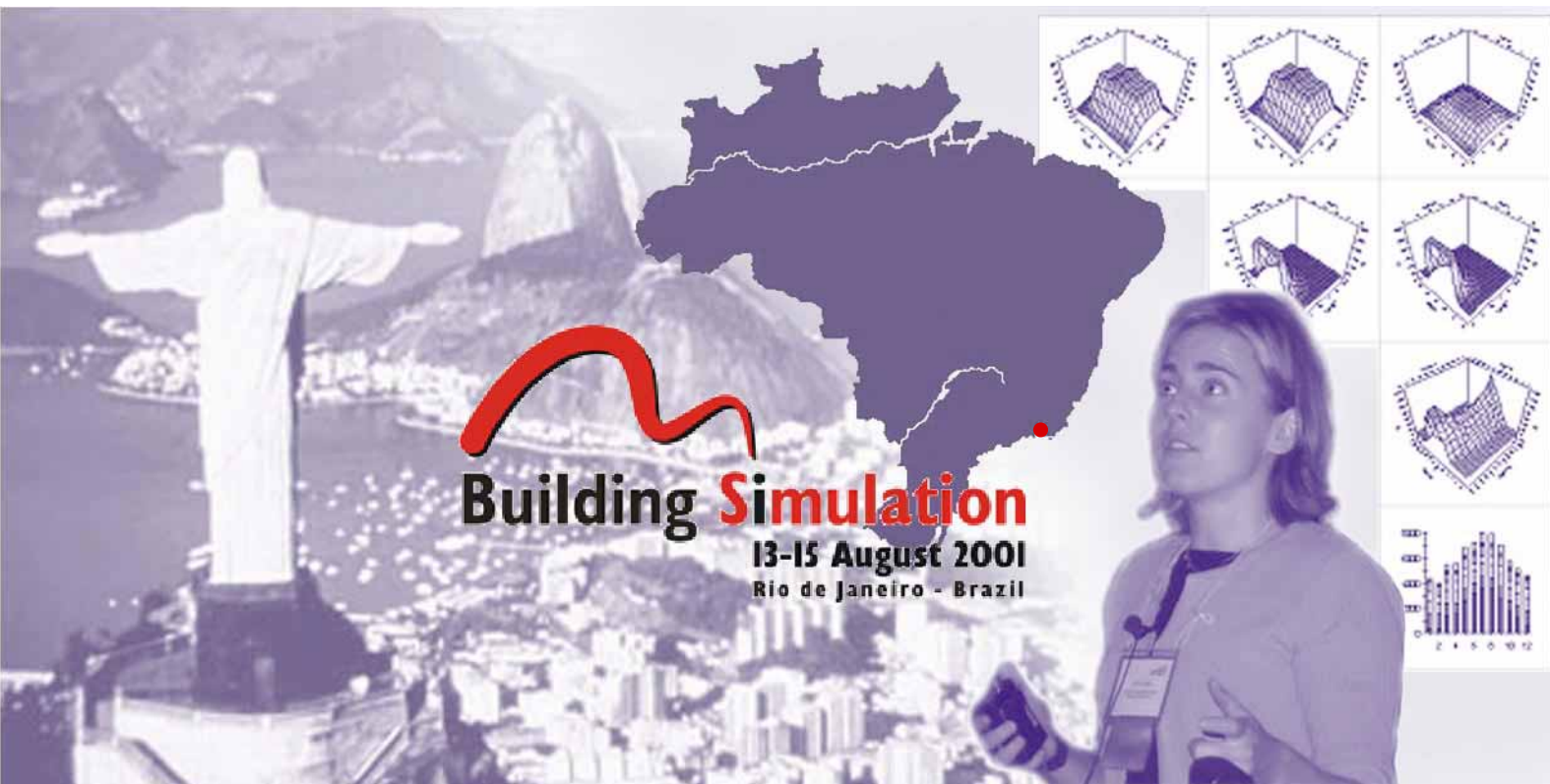
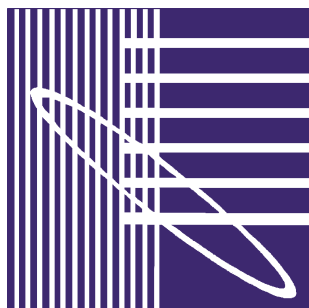


# *ibpsa*NEWS

volume 11 number 1





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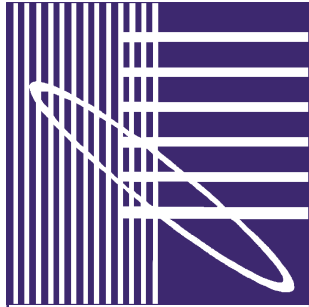
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The International Building  
Performance Simulation  
Association  
(IBPSA) exists to advance and  
promote the science of building  
performance simulation in order  
to improve the design,  
construction, operation and  
maintenance of new and existing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

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# President's message

IBPSA is a thriving international association. It will soon include twelve regional affiliates (Australasia, Brazil, Canada, Czech Republic, France, Greece, Ireland, Japan, Netherlands, Scotland, Slovakia, and USA). Its worldwide membership is over 600.

Starting in Vancouver in 1989, IBPSA has held successful conferences on a biannual basis (Nice 91, Adelaide 93, Madison 95, Prague 97, Kyoto 99). BS'01, the seventh IBPSA conference, will take place on August 13 - 15 in Rio. IBPSA conferences have attracted more and more participants and, at BS'01, we are anticipating over 300 delegates. In Rio, we will have the pleasure of announcing BS'03 and calling for volunteers to organize BS'05. This successful series of BS conferences is the main service that IBPSA offers to its members.

But it is not IBPSA's sole aim. The regionalization movement, launched by President Joe Clarke, and actively promoted by President Larry Degelman, is one of IBPSA's key activities. Regionalization has helped IBPSA to expand and to build closer contacts with practitioners. This is IBPSA's primary goal: to bridge the gap between researchers and practitioners in order to better disseminate simulation concepts and tools, and eventually to build more efficient and reliable buildings, taking account of environmental constraints.

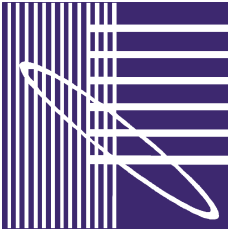
IBPSA is able to provide help with starting up new affiliates. Those of you, both researchers and practitioners, who are motivated by IBPSA's goals and who would like to establish a new region will receive a warm welcome. Do not hesitate to make contact with us to ask for information on how to establish a new region.

Dissemination of information is also a key activity of IBPSA. Past President, Larry Degelman has agreed to become the first IBPSA Newsletter Chairman. I would like to take this opportunity to thank him for his action and for revitalizing the IBPSA News. If you want to publish an article or to advertise in the News, please send him an e-mail ([larry@taz.tamu.edu](mailto:larry@taz.tamu.edu)).

Last but not least, we have appointed an IBPSA Web site Chairman: Karel Kabele ([kabele@fsv.cvut.cz](mailto:kabele@fsv.cvut.cz)) from IBPSA Czech Republic. If you have any suggestions for improving the IBPSA Web site ([www.ibpsa.org](http://www.ibpsa.org)) or for harmonizing the IBPSA regional Web sites, I encourage you to send your ideas and requests to Karel.

During my presidency I would like to help IBPSA grow and develop its worldwide member services. Do not hesitate to share your ideas and feelings with us; IBPSA is your association. By actively participating in its day-to-day life, make it grow even more lively and useful.

Roger Pelletret, President, IBPSA



# IBPSA Central Contacts

---

## Membership Services and Publications

For Proceedings of past IBPSA conferences contact:

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Click image for  
publications  
order form

## Newsletter submissions

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Click image for  
IBPSA Central  
membership  
form

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For information about IBPSA Building Simulation conferences, contact:

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Group FAGO - HG 10.80

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5600 MB Eindhoven The Netherlands

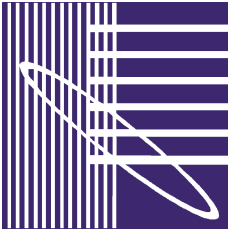
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## IBPSA Website

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](http://www.ibpsa.org).



# 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.



Click image for  
IBPSA Central  
membership  
form

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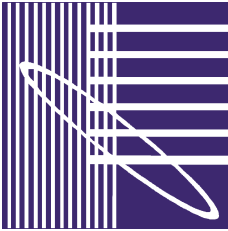
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(continued on next page)



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---

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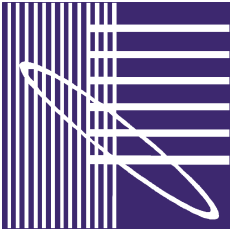
### IBPSA-UK (BEPAC):

BEPAC has now closed down, but UK building simulationists are welcome to join IBPSA by becoming members of the new affiliate, **IBPSA-Scotland**.

### IBPSA-USA:

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---

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**Drury Crawley** (At-Large), U.S. Department of Energy  
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**Philip Haves** (At-Large), Lawrence Berkeley National Laboratory  
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**Karel Kabele** (At-Large), Czech Technical University in Prague, Czech Republic  
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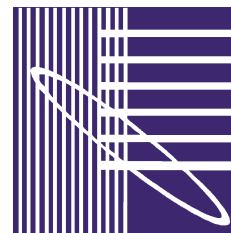
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# Building Simulation

13-15 August 2001  
Rio de Janeiro - Brazil



## Seventh International IBPSA Conference

---

### Aims



[Click image for BS'01 website](#)

The use of computer based models has become important in the design, operation, and management of buildings and building services. This is not yet widely recognized, and sometimes the models are hard to use. The capabilities and usability of such programs need to be improved if they are to be more widely used. The International Building Performance Simulation Association (IBPSA) was founded in 1986 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. Previous International conferences have contributed to these goals.

Holding the 2001 biannual Building Simulation conference in South America is an excellent opportunity to pursue this aim. The popularity of building simulation has rapidly increased in this part of the world. Although it is still in its infancy (most of the current activity being in the form of academic research), a lot of effort has been made to bring simulation into wider use in practice. An event of the calibre of BS'01 will certainly help to make practitioners in building and building services design, construction, operation and management more aware of the available technology.

### Scope of the conference

The conference scope incorporates all aspects of modeling and simulation of the built environment including building service systems. Specific topics include:

- simulation tools
- operation and management optimization
- ventilation
- weather data
- urban environments
- energy system analysis
- simulation of buildings physics
- validation
- simulation technology transfer
- integration
- human factors
- control optimization
- heat transfer
- moisture
- component and network modeling
- daylighting and solar shading
- HVAC simulation
- CFD
- acoustics





## Program

Registration for early arrivals opens on Sunday 12 August at 4pm and is followed by an 'Early Bird' reception at 7 - 8.30pm. Registration opens again at 8am on Monday 13 August and the conference begins at 9am. There will be three keynote speeches by distinguished speakers: Dr. Nathan Mendes will describe the current status of Building Simulation in Brazil, Professor Godfried Augenbroe will talk about Building Simulation trends as we enter the new Millenium, and Professor Clovis Maliska will discuss the integration of CFD in Building Simulation tools and some of the issues this raises. Over the following two and a half days about 170 papers will be presented in 9 parallel oral sessions and a poster session. Software demonstration sessions will also run in parallel throughout the conference. There will be a banquet on Tuesday evening, 14 August. See the full programme at the conference website: [www.labeee.ufsc.br/bs2001/](http://www.labeee.ufsc.br/bs2001/)

## Venue, Travel and Accommodation



Brazil is the largest country in South America and has a population of over 155 million, divided amongst 26 states and five regions. The official language is Portuguese. Rio de Janeiro was the capital of Brazil from 1763 until 1961, when the new city of Brasilia was appointed as capital. Rio is now the second largest city, with a population of about 6 million (the largest being São Paulo with approximately 10 million inhabitants). Rio is situated on the south eastern edge of Brazil, on the South Atlantic coast. It is one of the largest and most attractive coastal cities in the world, combining beautiful marine scenery with a unique tropical environment where businessmen walk side by side with those wearing shorts, T-shirts and sandals. Rio is easily accessible. It is home to some of the major Brazilian universities and has a very active scientific community. Information about Rio and Brazil is available at [http://150.162.75.140/bs2001/brazil\\_rio/brazil\\_rio.html](http://150.162.75.140/bs2001/brazil_rio/brazil_rio.html) and information about **travel and accommodation** can be found at [www.blumar.com.br/events/bs2001/](http://www.blumar.com.br/events/bs2001/)

## Registration



Click image for  
BS'01  
Registration  
Form

Registration fees (after 15 June 2001) are:

Full registration US\$410

IBPSA members US\$380

South Americans US\$350

Full time students US\$200

Accompanying persons US\$100

The participant's fee includes conference attendance, proceedings (printed or CD-ROM), breaks, banquet and welcome party. Lunch is not included. The accompanying person's registration fee excludes conference attendance and proceedings. Registration forms are included at the back of this ibpsaNEWS, or can be downloaded from the BS'01 website at [www.labeee.ufsc.br/bs2001/](http://www.labeee.ufsc.br/bs2001/). Fax your completed registration to +55 48 331-5182.



## Organising committee

Roberto Lamberts (Chairman), Federal University of Santa Catarina, Florianópolis, Brazil  
Cezar O. R. Negrão, Federal Centre of Technological Education of Paraná, Curitiba, Brazil  
Nathan Mendes, Pontifical Catholic University of Paraná, Curitiba, Brazil  
Jan Hensen, IBPSA Liaison Officer, Technical University of Eindhoven, The Netherlands  
Fernando Pereira, Federal University of Santa Catarina, Florianópolis, Brazil  
Paulo Schneider, Federal University of Rio Grande do Sul, Porto Alegre, Brazil  
Luís Mauro Moura, Pontifical Catholic University of Paraná, Curitiba, Brazil  
João Carlos Aguiar, CEPEL/Eletróbrás, Rio de Janeiro, Brazil  
José A. Bellini da Cunha Neto, Federal University of Santa Catarina, Florianópolis, Brazil.

The science committee consists of 130 reviewers for about 180 papers.

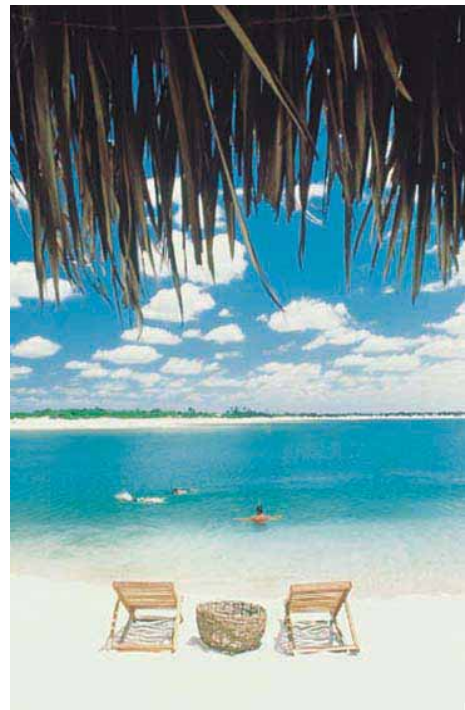
## BS'01 Secretariat



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e-mail: lamberts@ecv.ufsc.br  
bs2001@labeec.ufsc.br

## Latest news

The latest news about the conference is available at the BS'01 website at [www.labeec.ufsc.br/bs2001/](http://www.labeec.ufsc.br/bs2001/). The site contains detailed information on the technical program and links to sites containing information on hotels, travel, Brazil and Rio, as well as a conference registration form.

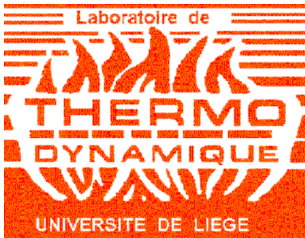


# Other forthcoming events

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## **6<sup>th</sup> International conference on System Simulation in Buildings Liège, Belgium 16-18 December, 2002**

### **Scope of the conference**



[Click image for conference website](#)

As with the five previous ones, this 6<sup>th</sup> conference will be organized in very close cooperation with the International Energy Agency (IEA, Energy Conservation in Building and Community Systems) and with the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

This conference will be the occasion to conclude the work done for the IEA-ECBCS Annex 34 "Practical Applications of Fault Detection and Diagnosis Techniques in Real Buildings" and to deal with some aspects of the new Annex 40 "Commissioning".

Accordingly, the following topics will be given priority :

- building and HVAC component modelling;
- practical use of simulation tools at the different stages of the building life cycle : design, commissioning, operation maintenance and retrofit.

### **Language**

The official conference language is English.

### **Instructions to authors**

A one-page abstract must be submitted for every paper. The abstract, including title, authors' affiliation, address, fax, phone and e-mail numbers, should be typewritten in English.

Abstracts should be sent as soon as possible to Michèle Deprez at:  
[Michele.Deprez@ulg.ac.be](mailto:Michele.Deprez@ulg.ac.be)

## **Important dates**

<b>Abstracts due</b>	<b>February 15, 2002</b>
Acceptance of abstracts notified, preliminary programme and instructions to authors for papers :	March 30, 2002
Notification of paper acceptance and final program :	September 3, 2002
<b>Electronic submission of papers :</b>	<b>October 15, 2002</b>
<b>Conference :</b>	<b>December 14-18, 2002</b>

## **Conference publication**

Abstracts of the papers will be available on our web site before the conference. Pre-prints will be forwarded to registered participants before the conference. These papers, along with questions and comments generated at the presentation, will be included in the CD-ROM of the conference. The CD-ROM will be forwarded to all fully registered participants.

## **Conference secretariat**

Please send all submissions to :

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LARET Louis (F)  
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MITCHELL John (U.S.A.)  
NGENDAKUMANA Philippe (Belgium)  
WANG ShengWei (P.R. China)  
WINANDY Eric (Belgium).

## **Conference website**

The conference website is at [www.ulg.ac.be/labothap](http://www.ulg.ac.be/labothap).

The conference web page will be updated regularly, providing electronic access to information on the technical programme, accommodation, etc. It will also link to our e-mail address, which we encourage you to use.

*Other forthcoming events*

## **IBPSA-NVL National conference**

**Thursday 13 December 2001**

**Netherlands Energy Research Foundation (ECN), Petten, NL**

IBPSA-NVL, the Netherlands + Flanders regional affiliate of IBPSA, will organize a national conference on Thursday 13 December 2001, at the Netherlands Energy Research Foundation (ECN) in Petten. The title of the conference is:

### **Better Building Design Through Performance Simulation**

The aim is to bring together users and developers of building performance simulation software in order to exchange knowledge and experiences. The role of simulation in the early design phases will be one of the focus points of the conference. Recent national and international developments and trends will be discussed too, as well as how modelling and simulation could play a more important role in information and communication in the construction industry. The conference will also address the current state and future plans of the IBPSA-NVL organization.

More information: [info@ibpsa-nvl.org](mailto:info@ibpsa-nvl.org) (general)  
[ibpsa-nvl@ecn.nl](mailto:ibpsa-nvl@ecn.nl) (conference).

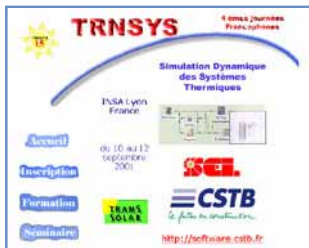
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## **4th French TRNSYS user days seminar and course**

**10 and 11 September, 2001**

**Lyon, France**

**in collaboration with INSA Lyon**



Click image for TRNSYS  
website

Werner Keilholz ([werner@cstb.fr](mailto:werner@cstb.fr)) of CSTB, France, is organizing this TRNSYS users seminar.

Details can be found in the "events" column of their website:  
<http://software.cstb.fr>

# News from IBPSA Canada:

**report on eSim Conference  
Ottawa, Canada  
June 13 - 14, 2001**

*On June 13 - 14, 2001, the CANMET Energy Technology Centre (CETC) in Ottawa, Ontario hosted the first Canadian conference on building energy simulation (eSim).*

*Sylvie Hill, Buildings Group, Natural Resources Canada*

Very few forums exist in Canada which provide sessions on building simulation research and applications. Either the focus on simulation practices receives *some* attention at a considerably large venue, or the topic is given substantial attention, but at a small and limited event. The eSim conference in Ottawa in June (2001) proved to be an unqualified success, drawing good numbers for a generous selection of topics varying in scope and depth.

Close to 100 participants, mainly from Canada, with government, universities and private industry around the world joined the *CANMET Energy Technology Centre (CETC)* in Ottawa to exchange ideas and experiences related to the development and application of building energy simulation software tools.

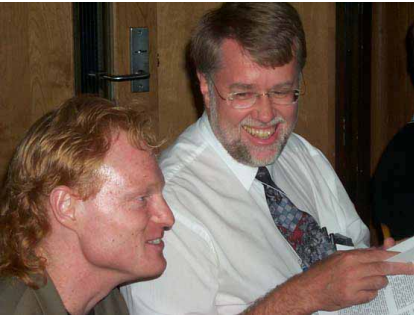
Delegates presented papers ranging in themes from the application of simulation software and programs in building design and guidance on modelling approaches, to energy calculation methods, software development and new simulation programs. Specifically, the conference explored how simulation tools can assist architectural design, HVAC design, and lighting design. The 32 papers were organized in these proceedings by the seven sessions held at the conference:

- The application of simulation in building design and guidance on modelling approaches;
- Energy calculation methods, software development, and new simulation programs;
- Modelling of non-thermal processes: lighting, moisture, material emissions;
- The role of simulation in supporting energy efficiency programmes and stock modelling;
- Modelling conventional and innovative HVAC systems;
- Calibration, validation, and reverse methods;
- Recent developments in modelling thermal and other physical processes



CETC's Julia Purdy presents a paper.





Ian Beausoleil-Morrison and Mark Riley

At eSim, papers included but were not limited to:

- Significant factors in modelling residential buildings;
- DOE2.1E Geometric modelling: the basic Geometric Approach vs. the Complex XYZ Approach;
- Developing project management and quality control approaches for improving the EE4 building simulation software;
- Development of analysis software for the optical characteristics and daylighting performance of conventional and tubular skylights;
- Advanced hygrothermal models and design models;
- Whole building energy simulation for access to incentive funding;
- Dynamic simulation of building heating systems connected to a district heating system;
- Measurement and simulation of the thermal environment of a low energy house with air-circulation in brick walls; and
- Demonstration of ESP-r's adaptive convection algorithm.

In addition, an International Perspectives Panel on the second day featured speakers from Japan, Europe and U.S.A. and their respective overview of how simulation is being used in their countries.

ESim's focus on the application of simulation to improve building design and operation provided useful information for architects and engineers active in building design, and attracted academics and government researchers, software developers, and incentive programs people.

The event was a success, enhancing Canada's network among key players in the building simulation field.

Notably, in addition to the plenary sessions, a Canadian chapter of IBPSA was rejuvenated, which will act as a forum for those with a similar interest in energy simulation. Ian Beausoleil-Morrison from the Buildings Group, CETC, was elected President, and Concordia University's Radu Zmeureanu will take on the responsibilities of Vice-President. The first board meeting takes place in July 2001.

Information related to ESim can be accessed at [www.esim.ca](http://www.esim.ca). Proceedings will soon be available at this site as well.



Click image for eSim website

*"The event was a success."*





# News from IBPSA Czech Republic

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*Frantisek Drkal, IBPSA-CZ President and Karel Kabele, IBPSA-CZ Vice President*

IBPSA-CZ was established in 1999 to support activities in building simulation and to create an environment for the professional development of IBPSA-CZ members. The activities of IBPSA-CZ recently have been focused on the organization of the bi-annual national Building Simulation conference, cooperation with other professional organizations in the Czech Republic, web page operation and support of the Czech representation at BS'01 in Rio de Janeiro.

*“first Czech national conference on Building Simulation.....50 participants with 32 papers”*

The first Czech national conference on Building Simulation was held in September 2000. There were about 50 participants with 32 papers, published in the proceedings. Several papers were published also in Czech professional journals. The next conference is planned to take place in September 2002. In the time between conferences, IBPSA-CZ cooperates with other professional organizations, e.g. the Society for Environmental Engineering, the biggest professional organization in the Czech Republic in the field of professional support at seminars and conferences. IBPSA-CZ participated at the seminars “Computers for heating systems designers”, “Computers for air-conditioning systems designers”, and the national Heating conference in the section “Computer aided design”. The IBPSA-CZ Web page provides information about such activities and is linked to the central IBPSA website. It is very gratifying that the number of Czech papers presented at the International Building Simulation conference has increased from 4 papers in Kyoto in 1999 to 7 in Rio in 2001.

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*Karel Kabele, Zuzana Krtkova, CTU, Prague*

*“a new tool ..... to design and optimise infrared radiant heating”*

The Centre for Diagnostic and Optimisation of Building Systems (CDOESB) at the Department of Microenvironment and Building Services Systems at the Faculty of Civil Engineering, Czech Technical University in Prague is developing a new tool, based on computer simulation, which helps to design and optimise infrared radiant heating systems in industrial halls. The algorithm enables the user to evaluate the layout and output of the heaters and optimise the design of the system, taking account of its energy consumption together with a comfort evaluation of the space according to hygiene standards requirements. The algorithm is at present being tested and there are ongoing experiments to verify the results.

For more information contact: [kabele@fsv.cvut.cz](mailto:kabele@fsv.cvut.cz)

# News from IBPSA Japan

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*Prof Harunori Yoshida, Kyoto University, regional IBPSA representative for Japan*

We held the first IBPSA-Japan meeting on 2 June 2001 in Kyoto. There were 53 participants, and the following presentations were made.

*“first IBPSA-Japan  
meeting .....  
53 participants”*

- Thermal Simulation Code TRNSYS/COMIS with IISiBat  
by Dr. Utsumi (Miyagi National College of Technology)
- An Organic Analysis for Quantitative Estimation of Heat Island by the Revised  
Architecture/Urban-Soil/Simultaneous Simulation Model, AUSSSM  
by Dr. Tanimoto (Kyushu University)
- Development of Thermal and Airflow Network Model  
by Dr. Okuyama (Shimizu Corp.)
- Optimal HVAC control using building thermal storage and optimal sizing of the  
capacity  
by Dr. Nagai (Osaka City University)
- Development of the Expanded AMeDAS Weather Data for Energy Calculations  
by Dr. Matsumoto (Akita Prefectural University)
- “BECS/CEC/AC”, Program for Simulation of Air Conditioning Systems in accordance  
with Energy Saving Law  
by Dr. Inooka (Nikken Sekkei Ltd.)



Click image for IBPSA  
Japan website

We have now set up an IBPSA-Japan web site at:  
[www.ne.jp/asahi/ibpsa/japan/index-e.htm](http://www.ne.jp/asahi/ibpsa/japan/index-e.htm)

We have established the official membership by charging a membership fee. The number of members is 49 at present.

# News from IBPSA UK (BEPAC) and IBPSA Scotland

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*Marion Bartholomew, David Bartholomew Associates, UK (BEPAC Administrator)*

*BEPAC ..... has come  
to the end of the road  
after 14 years*

I am sorry to be the bearer of sad tidings, but at a time when IBPSA is expanding into more and more countries worldwide I have to report that the UK affiliate, BEPAC (Building Environmental Performance Analysis Club), which was set up in 1987, has come to the end of the road and officially closed its doors at the end of June this year. BEPAC has in the past had many years of support from the UK Department of the Environment and its successor departments, and from the UK Building Research Establishment, but with growing professional workloads it has proved increasingly difficult for members of the club to devote sufficient time and effort to BEPAC to keep it alive. The UK research agenda has also moved on, and many people who in past years were able to attract funding for research in building simulation are now following the funding to study more general issues of sustainability.

*IBPSA Scotland will  
..... welcome members  
from any part of the  
UK*

However, almost coincident with the closure of IBPSA-UK, the new regional affiliate IBPSA Scotland has recently been approved, based on the Scottish Energy Systems Group (SESG) run by Lori McElroy at the University of Strathclyde. Although Company membership (which entitles businesses to free or heavily subsidised in-house, project specific simulation training, associated free computer loans and access to free or discounted software training courses) costs £500 or £1000, membership for individuals is free. This entitles members to newsletters and attendance at seminars and workshops. To become a member all you need to do is to register with SESG. E-mail Lori at [lori@esru.strath.ac.uk](mailto:lori@esru.strath.ac.uk). IBPSA Scotland will be pleased to welcome members from any part of the UK who wish to continue their IBPSA membership, or to join IBPSA for the first time.

BEPAC's last seminar, which was organised jointly with IT-Innovation, was held in March 2000 at SGI's (Silicon Graphics Inc) UK base near Reading, Berkshire. The title of this event was "Visualising the Future", and it included demonstrations of several different virtual environments in SGI's Reality Centre as well as talks by both researchers and practitioners using High Performance Computing in the field of building design. As a last offering from IBPSA-UK to IBPSA members in other parts of the world, I have included an overview of one of the projects described at this seminar on the following pages (**VISAGE - An Application in Visual Simulation**).

Finally, I expect to mount some of BEPAC's publications on an archive website where they can be accessed free of charge by all those interested. When this has been done I will pass the website address to the IBPSA Webmaster so that a link can be added from the IBPSA website ([www.ibpsa.org](http://www.ibpsa.org)).

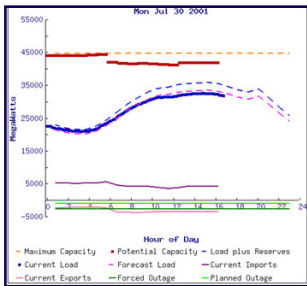
# Other news

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## New LBNL website shows California electricity supply/demand

Alan Meier, Berkeley Lab (LBNL), USA

LBNL has a new web site. Its url is: <http://energycrisis.lbl.gov>



Click image for electricity  
data website

It shows, in real-time, the supply and demand for electricity in California. This is the first time that such data have been made publicly available. Building simulators will need this kind of information to design buildings that minimize energy consumption during the peak (that is, expensive) periods. Even if the chart isn't directly relevant, it's interesting to observe that the state goes into blackout alert on hot afternoons.

Similar information might become available for other areas. For example, Texas, <http://www.ercot.com/> is getting organized to collect the data to do it. The Pennsylvania/ NY region has the data but isn't charting it yet.

LBNL hopes to add real-time electricity prices to its site as soon as they become available. This will be of particular interest to building simulators because they will be able to calculate their building's electricity bill for different designs.

Any comments to Alan at:

Berkeley Lab (LBNL), Building 90-2000

Berkeley, California 94720 USA

Tel. +1 (510) 486-4740 Fax +1 (510) 486-4673

e-mail: [AKMeier@LBL.gov](mailto:AKMeier@LBL.gov)

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## New LBNL project works towards Interoperability

*Vladimir Bazjanac, Lawrence Berkeley National Laboratory (LBNL).*



Click image for BS-8 project website

LBNL has started work on a project to complete the HVAC extension schemata of the IFC object data model so information needed for building energy simulation can be seamlessly exchanged among IFC-compatible tools. IFCs formulate a new intelligent data model of buildings, developed by the International Alliance for Interoperability (IAI). The IAI designation for this project is BS-8.

The IFC data model already supports seamless exchange of building geometry (EnergyPlus 1.0 bundles middleware and an interface that can import building geometry directly from CAD). The BS-8 project objective is to complete HVAC and supporting definitions so that simulation input and output data can be shared seamlessly with upstream and downstream applications.

BS-8 project schedule is aggressive: the schemata and pilot implementations will be completed by June 2002. The project is supported by the U.S. Department of Energy and the California Energy Commission. Private and government organizations from five countries are collaborating on the project.

The project web site is <http://eetd.lbl.gov/btd/iai/index.html>; navigate to BS-8 from there. For more information and if you want to participate in the project please contact Vladimir Bazjanac at [vlado@gundog.lbl.gov](mailto:vlado@gundog.lbl.gov).

# Building Design Advisor version 3.0 released

*Konstantinos Papamichael, Ph.D. and Vineeta Pal, Ph.D., Building Technologies Department, Environmental Energy Technologies Division, Ernest Orlando Lawrence Berkeley National Laboratory*



Click image for BDA website

A new version of the Building Design Advisor (BDA) software has been released from the US Berkeley Lab. The new version (3.0) is available free of charge from <http://gaia.lbl.gov/BDA>. Main new features since the 2.0 release include a new electric lighting module, DOE-2 parametric runs for window size optimization and dual unit capabilities (English and Metric).

## The BDA software

*BDA .... supports the integration of multiple building models and databases*

The BDA is a computer program that supports the integration of multiple building models and databases used by simulation, analysis and visualization tools, through a single, object-based representation of building components and systems. The BDA acts as a data manager and process controller, automatically handling the input and output to and from multiple simulation, visualization and analysis tools, allowing building designers to benefit from their prediction capabilities throughout the building design process. The BDA allows maintenance of and comparison among multiple designs, throughout the design process. It has a simple Graphical User Interface that is based on three main elements, the Schematic Graphic Editor, the Building Browser and the Decision Desktop.

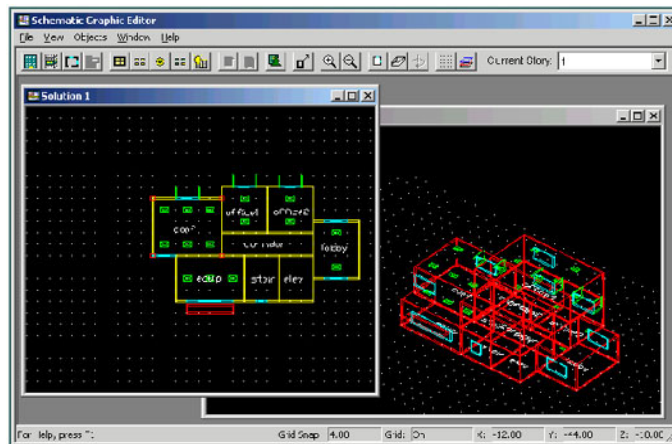
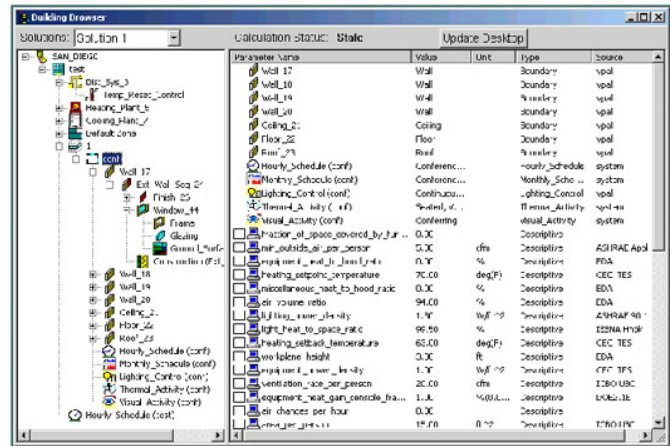


Figure 1: The Schematic Graphic Editor

The Schematic Graphic Editor (Figure 1) allows designers to quickly and easily specify values for basic building geometric parameters. Through a default value selector mechanism, the BDA automatically assigns “smart” default values to all non-geometric parameters required by the simulation and analysis tools. These values are selected from databases of alternative building components and systems, based on building location and building/space type. These default values can be easily reviewed and changed through the Building Browser.

Figure 2: The Building Browser



The Building Browser (Figure 2) allows building designers to quickly navigate through the multitude of descriptive and performance parameters addressed by the analysis and visualization tools linked to the BDA. Through the Browser the user can edit the values of input parameters and select any number of input and output parameters to display in the Decision Desktop, for any number of alternative designs.

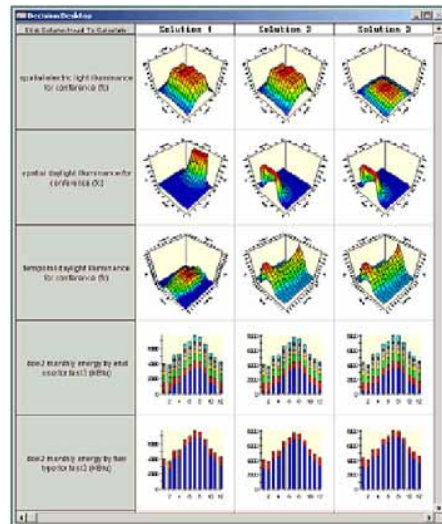


Figure 3: The Decision Desktop

The Decision Desktop (Figure 3) allows building designers to compare multiple designs



with respect to multiple parameters, as addressed by the analysis and visualization tools linked to the BDA. The data are displayed graphically.

## Lighting and energy analyses

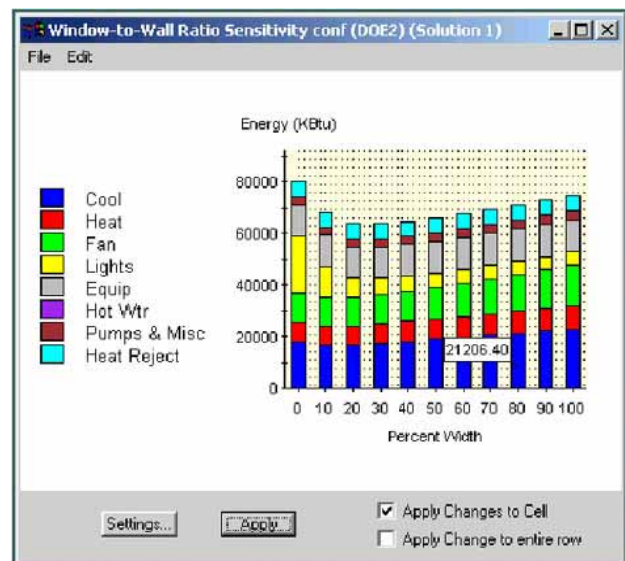
BDA 3.0 supports performance prediction with respect to various performance considerations, through links to a simplified Daylighting Computation Module (DCM), a simplified Electric lighting Computation Module (ECM), and the DOE-2.1E Building Energy Simulation software.

For lighting analyses, the user can define spaces and place luminaires, windows, overhangs and vertical fins in the Schematic Graphic Editor. Sensor points may be added to observe lighting levels at particular points. The user can select various performance parameters to be computed, e.g., spatial illuminance from daylight, temporal illuminance from daylight, spatial illuminance from electric lighting, and spatial or temporal glare values. The Daylighting (DCM) and Electric Lighting (ECM) tools are activated accordingly.

For energy analyses, BDA supplies DOE2.1E with hourly weather information along with a description of the building and its HVAC equipment and occupancy patterns. The HVAC system and Plant specifications which are provided default values according to building type and location, and which can be modified by the user at any time. The energy related performance parameters that can be computed include annual and monthly energy-use values, broken down by end-use and by fuel-type.

BDA 3.0 also supports DOE2.1E parametric evaluations of energy requirements by end use as a function of Window-to-Wall ratio, allowing quick and easy optimization of window size (Figure 4).

Figure 4: DOE2.1E parametric runs



BDA also allows the analysis of control strategies and sensor placement for maximizing energy savings from lighting control while providing visual comfort. To model lighting controls, users can select control strategies, e.g. stepped or continuous dimming, place any number of sensor points, and create lighting zones through links among the various luminaires and sensor points. BDA is set up to allow users to make these associations easily, using “relation objects”, in a manner that can transparently be observed and controlled.

## **Future directions**

Work is already underway for the next version, which will include links to the RADIANCE day/lighting simulation and rendering software. Plans for future versions include links to additional simulation tools and databases, e.g., cost estimating modules, life-cycle costing modules, as well as links to commercial CAD software and electronic product catalogs.

## **Acknowledgments**

This work was supported by Public Works and Government Services Canada and the Panel on Energy R&D of the Federal Government of Canada, through Enermodal Engineering Ltd. of Kitchener, Ontario, Canada and by the Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technology, State and Community Programs, Office of Building Research and Standards of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

For more information on the BDA software, please visit the BDA Web site at <http://gaia.lbl.gov/BDA>, or contact Konstantinos Papamichael at [K\\_Papamichael@lbl.gov](mailto:K_Papamichael@lbl.gov), phone +1 (510) 486-6854, or Vineeta Pal at [VPal@lbl.gov](mailto:VPal@lbl.gov), phone +1 (510) 486-4781.

# VISAGE - An Application in Visual Simulation

*Marion Bartholomew, BEPAC (IBPSA-UK), based on material provided by Mark Sawyer of Edinburgh Parallel Computing Centre (EPCC) and Jon Mengham of Edinburgh Old Town Renewal Trust (EOTRT). The work involved collaboration between EOTRT, EPCC and the Turnbull Jeffrey Partnership (TJP).*

## The project

*“photo-realistic images and video sequences in a commercially-acceptable time and.....commercially viable cost”*

There is growing interest in the use of CAD models of towns and cities to help assess the visual impact of proposed new buildings. However, members of planning committees, and the public, find it difficult to understand standard CAD output. Photo-realistic images and animations can be much more telling - but few design practices have the expertise and computing power needed to produce them in a reasonable time, or the facilities to transfer them to VHS tape for others to use. The VISAGE project aimed to show that a high performance computing bureau can deliver photo-realistic images and video sequences in a commercially-acceptable time and, for large projects at least, at a commercially viable cost. It proved highly successful, with wide press coverage and demonstrations at several trade exhibitions including one of the largest construction industry events in Europe, ScotBUILD. Reactions to the videos from professional planners and the construction industry have generally been highly favourable, though some doubts have been expressed about their business benefits.

*“future animations like these and .... Virtual Reality promise to be the ideal way ...to present results from ....simulations to clients and other non-specialists”*



In the future, animations like these - and, ultimately, the fully interactive experience of Virtual Reality - promise to be the ideal way for the modelling community and designers to present results from thermal, air movement, fire, people movement and other simulations to clients and other non-specialists.

An aerial view of Edinburgh Old Town



Click image for EPCC website

VISAGE was a collaboration between the Edinburgh Old Town Renewal Trust (EOTRT), which owns a CAD model of the historic 'old town' area of Edinburgh - the pre-Georgian part of the city - the Turnbull Jeffrey Partnership (TJP), an environmental and landscape consultancy, and the High Performance Computing Network (HPCN) bureau at the University of Edinburgh's Parallel Computing Centre (EPCC). About 80% of the funding came from the European Commission.

The HPCN bureau enhanced the colour and texture of EOTRT's model and improved it in other ways using specialist software developed at EPCC. They then generated frames along pre-defined camera paths to produce a number of video sequences, and finally converted it to VHS video.

Analysis of the costs showed that most was incurred in converting and transferring data; computing cost was relatively small. In the future, more sophisticated, automated image enhancement and data handling software is likely to reduce costs appreciably.

## Technical details

*"the Old Town model - 1200 buildings in a 125Mb database"*

EOTRT delivered the Old Town model - 1200 buildings in a 125Mb dataset - to EPCC in forty five DXF R12 files, each containing data for part of the area.

*"EPCC enhanced the model ... to improve the quality of the ultimate images"*

EPCC enhanced the model in various ways intended to improve the quality of the ultimate images, using additional data on colours and other details provided by EOTRT and texture images freely available on the Internet.

EPCC evaluated a number of free and commercial software packages for converting between DXF and the format required by the chosen POV-Ray rendering package. None appeared to be suitable, so EPCC wrote a conversion utility, VNAF. This performs interpolation and constructs a data file in appropriate format, ignoring data such as lines of construction which are irrelevant in this context. VNAF can also enhance models in various ways, including automated material assignment, the placing of textures such as the Old Town's characteristic granite sett roads, composite object substitution, and the representation of outdoor lighting. The lighting model represents direct sunlight, diffuse sunlight (using appropriate arrays of point lights) and diffuse inter-reflection between surfaces (using low-level even illumination of all surfaces). There was some concern that this simple approach would be inadequate in locations such as courtyards, but studies showed that the addition of radiosity calculations made negligible difference.

EPCC also developed a number of extensions to POV-Ray to represent trees (using partially transparent texture images) and water, to make it easier to produce a sequence of single-frame viewpoints, and to allow multiple processors to work independently on different frames.

The final image sequences were rendered on a Sun Enterprise Server SMP and a Meiko CS-2 MPP to produce video sequences between 45 and 80 seconds long at 25 frames/sec.

## Benefits and costs

The Edinburgh Old Town Renewal Trust originally developed its model to help designers show their clients, and planners, what proposed developments would really look like. However, many of the design practices who would like to use the model lack the expertise and facilities to do so, particularly at the short notice common in construction. Armed with the new tools developed by EPCC, the HPCN bureau is able to offer an efficient service which overcomes the problem.

The Turnbull Jeffrey Partnership has used computer visualisation extensively in the past to help clients and planners understand proposed changes in the landscape and the built environment, but it has lacked the computing power needed to produce effective animations. The VISAGE project has convinced them that work like this can be handled effectively by a bureau, and opened up a new range of possibilities.

One of the inhibitions to animation in the past has been uncertainty about the likely costs. The effort used in VISAGE was recorded in detail, so costs can be estimated with confidence in the future.

*“EOTRT estimate that modelling a proposed development ..., inserting it into the Old Town model, selecting surface textures ... and specifying camera paths for the animations will typically take 1-3 days”*

Based on their experience, EOTRT estimate that modelling a proposed development (complete with layer and colour assignments), inserting it into the Old Town model, selecting surface textures from existing libraries and specifying camera paths for the animations will typically take 1-3 days.

Task	Effort (person-days)	Duration (days)	Cost (Euro)
<i>Staff effort:</i>			
1 Conversion	1	1	450
2 Set-up	0.5	0.5	250
3 Monitor	0.5	-	250
4 Post-processing	0.5	0.5	250
5 Delivery	-	1	50
Subtotal			1250
<i>Computing:</i>			
Per-frame cost	-	-	2
6 Compute (5 sec)	-	$125/N_p + 1$ day	250
6 Compute (30 sec)	-	$750/N_p + 1$ day	1500
<b>Total Cost (5 sec)</b>	<b>2.5 person-days</b>	<b>3 days + <math>125/N_p</math></b>	<b>1500</b>
<b>Total Cost (30 Sec)</b>	<b>2.5 person-days</b>	<b>3 days + <math>750/N_p</math></b>	<b>2750</b>

where  $N_p$  is the number of processors used.

From this starting point, EPCC estimate that bureau costs will be as shown in the above table. Costs are higher if the bureau has to do the work needed to enhance a basic CAD model to the level EOTRT can provide, principally because of the time needed for bureau staff to assimilate high-level information from the developer of the basic model.

The project team concluded that the availability of high-performance computers is critical in making it possible to complete work like this in a commercially-acceptable timescale, and bureau computing can be affordable in large-scale and prestige projects.



# IBPSA Board agendas

**Kyoto, 16 September 1999**

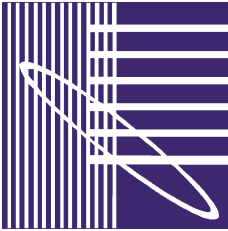
**Paris, 5-6 October 2000**

**Rio, 16 August 2001**

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## **Agenda for IBPSA Board meeting, 16 September 1999, Kyoto Research Park, Kyoto, Japan**

1. Introductions and roll call (Williamson)
2. Agenda revisions and approval (Degelman)
3. Approval of minutes from board meeting in Paris (21-22 Sept. 1998) (Degelman)  
(Minutes previously circulated electronically)
4. Announcements from all. (Welcome to new affiliates, etc.)
5. BS'99 report  
Introduction (Degelman)  
Overview (Hensen)  
Financial reconciliation with BS99 Organizing Committee (Degelman)  
IBPSA Awards (Williamson)  
Best paper/poster awards (Hensen)  
Papers to be published in journals (Hensen)  
Lessons
6. Treasurer's report (Sowell)
7. Membership services report (Haberl)
8. Consideration of proposal(s) for BS'2001 (Hensen)  
Future conference management
9. Recognition and Ratification of new Affiliates.
10. Nomination of new executive committee, confirmation of board (Degelman)
11. IBPSA future budgeting plan (Sowell)
12. IBPSA Web sites review (Spitler/Pelletret)
13. Newsletter (Pelletret)  
Status  
Finance plan
14. Old business:
  - Affiliate relationships to IBPSA Central
  - Maintain membership directory
  - Library of Proceedings for Affiliates
  - Maintaining the IBPSA library
  - Publish journal
  - other
15. New business
- Adjourn



**Agenda for IBPSA Board meeting, 5-6 October 2000, CSTB Paris, 4 avenue du Recteur Poincaré, 75 016 Paris, France**

Agenda, 5 October

1. Introductions and roll call (Degelman)
2. Agenda revisions and approval (all)
3. Approval of minutes from board meeting in Kyoto (16 Sept. 1999) (Degelman)
4. Treasurer's report (Spitler)
5. Membership services report (Haberl)
6. Regionalization and International Activities (Reg. Rep.)
  - Regional activities reports by each affiliate representative
  - Proposals for new affiliates (IBPSA Scotland)
7. BS'2001 report and discussions (Conf. Org. Cmte. Members)

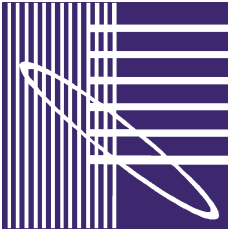
Approx. 6:00 p.m. Adjourn

8:00 p.m. Social event

Agenda, 6 October

8. By-laws revision (Degelman)
9. Travel expenses reimbursement procedure (Spitler)
10. Newsletter — Chairman (Degelman)
11. Newsletter — Media, content, frequency, advertising
12. IBPSA web sites (Pelletret)
  - Review of regional web sites (Reg. Rep.)
  - IBPSA central web site (Haberl)
13. IBPSA budgeting plan (Spitler)
14. Old business
  - Affiliate relationships to IBPSA Central
  - Maintaining membership directory
  - Maintaining the IBPSA library
  - Library of Proceedings for Affiliates
  - Publish journal
15. New business
16. Adjourn





**(Provisional) Agenda for IBPSA Board meeting, 16 August 2001, Rio Othon Palace, Rio de Janeiro, Brazil**

1. Introductions and roll call (Pelletret)
2. Agenda revisions and approval (all)
3. Approval of minutes from board meeting in Paris (5-6 Oct. 2000) (Pelletret)
4. By-laws revision (add section on Affiliates) (Degelman)
5. Treasurer's report (Spitler)
6. Membership services report (Data Base of all members) (Haberl)
  - Which "value" in return for membership? (Chip Barnaby)
7. Regionalization and International Activities (Reg. Rep.)
  - Start-up funds (written procedure and person in charge) (Degelman)
  - Establishing IBPSA NVL (Netherlands + Flanders) (Hensen)
  - Proposals for new affiliates (if any)
8. BS'2001 report and discussions (Conf. Org. Cmte. Members)
9. BS'2003 report and discussions (Conf. Org. Cmte. Members)
  - Procedure of selecting candidates (Sowell)
10. Newsletter (Media, content, frequency, advertising) (Degelman)
11. Awards procedure (Hensen)
12. IBPSA web sites (Kabele)
  - IBPSA central web site (Haberl)
    - Maintaining e-mail lists (Hensen)
    - Archiving documents (by-laws, strategic plan, regionalization invitation + guidelines (Hensen)
    - Publishing IBPSA articles on the web (Haberl)
  - Regional web sites (Kabele + Reg. Rep.)
13. IBPSA budgeting plan (Spitler)
14. Old business
15. New business
- Adjourn

*This edition of ibpsaNEWS was designed and produced by David Bartholomew Associates, U.K., [dba@compuserve.com](mailto:dba@compuserve.com)*

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## IBPSA Regionalization Guidelines

### IBPSA's Mission

The International Building Performance Simulation Association (IBPSA) is a non-profit making organization that was first incorporated in January 1987. The Association's principal mission is to promote and advance the practice of building performance simulation in order to improve the energy and environmental performance of new and existing buildings worldwide.

IBPSA seeks to achieve its goals through the establishment of a range of products and services aimed at informing and equipping those who are involved in the construction industry and who seek to utilize computer-based tools to good effect. To this end, the **IBPSA Strategic Plan** identifies nine specific areas that encompass the organization's activities. These are:

1. **Strategic Alliances** with professional organization such as the engineering and architectural societies. The intention is to engender a better understanding of the profession's requirements and the technology's potential.
2. **International Conference Series** to periodically collate and preserve those developments that comprise the current state-of-the-art.
3. **Technical Development Program** aimed at influencing the direction the technology of building simulation might take at any given point in time.
4. **Educational Initiatives** concerned with the teaching of building simulation in the higher education institutions and in the context of continuing professional development.
5. **Harmonization Activities** in an attempt to regularize the application of the different modeling systems through the definition of standard methods for performance assessment and the provision of standard support data.
6. **Member Recruitment** aimed at extending the IBPSA products and services to those practitioners who can most benefit from the new technology.
7. **Products and Services** devised in response to the profession's evolving needs.
8. **Technology Transfer** concerned with the delivery of training in all aspects of computer-based performance assessment at all stages of the building life cycle.
9. **Regional Development** to subject the foregoing activities to appropriate regional influences and enable their effective delivery.

This document addresses the last area concerned with regional development in order to more effectively address local needs and create a mechanism for an international exchange of know-how and best practice.

### Rationale

IBPSA has achieved significant success at the international level - largely through its biannual conference program (Vancouver '89, Nice '91, Adelaide '93, Wisconsin '95 and Prague '97) and worldwide electronic mailing facility. IBPSA has also recognized the difficulties surrounding the development of products and services that are appropriate to the day-to-day needs of its members.

The underlying causes of these difficulties are twofold. Firstly, the geographical spread of IBPSA members is wide and gives rise to a requirement to cover disparate work practices, technologies and professional needs. Secondly, IBPSA's organizational structure is such that the coordination of activities at the local (regional) level is problematic. At the same time like-minded, but regional, organizations are making significant progress at the local level through their seminar, workshop, publications, training and software development activities.

If the construction industry were to be well supported in its attempts to harness effectively the emerging IT and simulation technologies then the establishment of regionally based support organizations was essential. Equally essential was the creation of a structure by which these organizations could affiliate in order to disseminate their know-how and promote their local best practice. Only in this way could the benefits of the new technology be understood and future standardization enabled. It was with the view of a network of autonomous regional organizations that IBPSA has turned to regionalization and is encouraging existing or newly formed groups to become IBPSA affiliates.

### Structure and Operation

Under the existing structure, IBPSA affiliates are financially and administratively independent. In practice, this means that they raise and deploy their funds as long as these funds are under the control of elected officers and are used in pursuit of aims and objectives that are consistent with those of IBPSA. IBPSA-Central concentrates its resources on issues such as inter-region communication, international conferences and product standardization. In this way IBPSA complements and empowers the regional affiliates in their attempts to inform and support their members in the context of local design issues and concerns. The entire IBPSA network is represented by a 15-member Board comprised of an executive and regionally elected officers.

The following guidelines have been devised to assist with the establishment and operation of an IBPSA regional affiliate.

1. Organizers of a new regional affiliate should prepare a brief proposal for the IBPSA Board of Directors. This should outline the proposed name, geographic territory, organizational structure and goals and objectives (if different from those included in the IBPSA charter statement). Affiliation depends only on the organization having a purpose and mission consistent with those of IBPSA. The Affiliate and IBPSA then enters into a specific agreement by defining their working relationship based on regional considerations prevalent at the time.
2. Regional affiliates may be named "**IBPSA <region>**" or they may use any other appropriate name. Their letterhead and other publicity material should indicate that they are "an affiliate of IBPSA".
3. For regions with limited financial resources, IBPSA can provide a limited amount of **matching start-up funds** (see below) to aid the initial set-up of the affiliated organization. A case for support should be submitted to the IBPSA Secretary for consideration by the Board. (See attached proposal guidelines.)
4. The financial structure of a regional affiliate is independent from IBPSA. This means that affiliates will retain all member dues or other funds raised by their activities.
5. IBPSA will provide affiliates with a list of operational guidelines (see attached by-laws), contact information for persons available to assist the local organizer and electronic images of the IBPSA logo.
6. The regional affiliate will provide membership data to IBPSA for use in mailing IBPSA materials.

7. Members of the regional affiliates will automatically be full members of IBPSA. Any given individual or organization will pay dues directly to IBPSA only if there is no regional affiliate operating in their area.
8. IBPSA will make newsletters and other IBPSA materials available to all members of the regional affiliates either in printed form or in downloadable electronic format from the IBPSA web page. This will be at no cost or at a nominal cost depending on the circumstances. Other services may be provided by IBPSA to the regional affiliates for a fee.

**Start-up Proposal Guidelines:**

It has been the IBPSA Board's policy to grant start-up funds to regions that are in need of matching funds to get the organization officially registered and/or to purchase initial office support equipment. The proposal should be submitted to the IBPSA board and should contain the following elements:

1. Name of Affiliate: i.e., **IBPSA-<region>**.
2. Geographic territory covered.
3. Organizational structure – The IBPSA Charter is founded on a set of board- and member-approved by-laws (see attached). Each Affiliate's organizational structure is therefore expected to adhere to the same or similar principles of operation.
4. Officers -- i.e., Specify the officers that will be constitute the board (e.g., Chairperson, secretary, treasurer, etc. – see IBPSA by-laws)
5. List of goals and objectives – Must be consistent with the mission statement and objectives of the IBPSA Charter.
6. Minutes of the first organizational meeting, indicating organizational business transacted.
7. List of initial members and their affiliations (can be those attending the first meeting).
8. Proposed activities of the affiliate.
9. Proposed amount of annual membership dues.
10. Breakdown of costs associated with set-up of the Affiliate organization.
11. Amount of matching funds provided by the Affiliate.
12. Amount of the requested support from IBPSA. \*

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\* Please note that IBPSA's policy is to provide start-up funds with the expectation that the Affiliate will return the granted amount once the region reaches financial stability. The Affiliate is therefore asked to return the funds on a voluntary basis, so other regions can be assisted in the same fashion.



## **Becoming an IBPSA Affiliated Organization**

If you would like to become an affiliated organization then please write to the IBPSA Secretary at the address given at <http://www.ibpsa.org> . Alternatively, you may wish to discuss the matter further with one of the IBPSA office bearers or a representative of one of the existing affiliates whose addresses can also be found at <http://www.ibpsa.org>.