

*ibpsa*NEWS

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IBPSA
BUILDING
SIMULATION
CONFERENCE
2015
HYDERABAD
DECEMBER 7 - 9, 2015

BS 2015, Hyderabad - India



INTERVIEWS

with Christoph van Treeck, Professor of Energy Efficient Building (E3D) and Dirk Müller, Head of the Institute for Energy Efficient Buildings and Indoor Climate (EBC), about research at RWTH Aachen

SOFTWARE NEWS

about CommONEnergy, an Integrated Modelling Environment for shopping malls, and a DesignBuilder update

GLOBAL COMMUNITY NEWS

from IBPSA affiliates in Canada, Egypt, Italy, Japan, Korea, Nordic countries, Netherlands & Flanders, Switzerland, and the USA

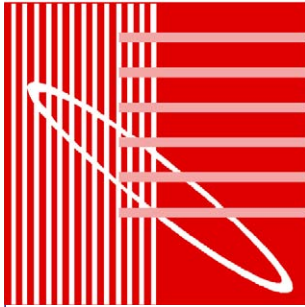
CALENDAR OF EVENTS

7 conferences and other events for your diary, including more information about BS2015



Contents

President's message	3
2014 Board of Directors Election	4
Projects and work at RWTH Aachen University, Germany	5
Forthcoming events	9
Calendar	9
IBPC 2015: Building Physics for a Sustainable Environment	9
SEB-15: Sustainability in Energy and Buildings	10
Building Simulation 2015: 14th IBPSA International Conference	11
BSO 2016: 3rd IBPSA-England conference	15
Software news	17
CommONEnergy: an Integrated Modelling Environment for shopping malls	17
DesignBuilder update	19
IBPSA announcements	21
Fly the IBPSA colors!	21
Student Travel Awards — supporting students to attend BS2015	21
News from IBPSA affiliates	23
IBPSA-Canada	23
IBPSA-Egypt	24
IBPSA-Italy	25
IBPSA-Japan	26
IBPSA-Korea	27
IBPSA-Nordic	27
IBPSA-Netherlands + Flanders	27
IBPSA-Switzerland	28
IBPSA-USA	29
University news and job opportunities	32
A Finnish project on local energy matching	32
About IBPSA	34
Affiliates	34
Committee chairs & contacts	35



The International Building Performance Simulation Association 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

Dear IBPSA colleagues and friends,

I am just getting my feet on the ground after becoming President in February. And my feet have to fill big shoes – I follow four years of Ian Beausoleil-Morrison's steady leadership. As Ian reported in his October 2014 message and as summarized on page 4, IBPSA is now operating under revised By-Laws dictated by changes in Canadian law. A new Board of Directors (BoD) was elected in late 2014 under the updated procedures and the officers listed at left were selected by the BoD.

The challenge for the new BoD is to simultaneously carry on with successful activities while also extending what IBPSA does. The Board has a number of "operational" committees that oversee current programs, including Publications, Conference, Web Site, and Education. Now emphasis is shifting to "what next?". Ideas for new undertakings include establishing mechanisms for sharing code and data, publishing consensus-based reference information, developing training materials, and sponsoring research. All fine possibilities, but there is an overriding question – what is IBPSA's long view? Where do we want the field of building performance simulation to be in 10, 20, or even 100 years? There is a lot to grapple with, given rapidly increasing computing power, the Internet, and the demand for sustainable, high-performance buildings. The Futures Committee, chaired by Joe Clarke, is working to articulate a vision for IBPSA and develop a set of tactical priorities. The newly-created IBPSA College of Fellows will undoubtedly be asked to provide additional guiding wisdom.

An important dimension of our planning must be remaining true to the "I" in IBPSA. Regional affiliates can address locale-specific topics such as energy code compliance and building ratings. The world organization should concentrate on areas of that serve the entire field – harmonizing terminology, validating models, providing communication frameworks, and the like.

The practical aspect of any next steps is finding champions to implement what is proposed. IBPSA remains an all-volunteer organization. Help wanted - if you have interest in working on current activities or helping launch new initiatives, please contact me or suitable committee chairs. Email addresses are found on page 35 of this edition of the IBPSA News and also at www.ibpsa.org.

Finally, I urge you to attend the upcoming Building Simulation 2015 in Hyderabad, India (Dec 7 – 9, 2015). Nearly 1000 abstracts have been received and papers are being prepared at the time of this writing. In the long Building Simulation tradition, the conference promises to be an unmatched opportunity to exchange ideas with fellow simulationists from around the world. I hope to see you there.

2014 Board of Directors Election

IBPSA is a Canadian Not-For-Profit corporation. In the fall of 2014, IBPSA applied for and received Articles of Continuance from the Canadian government, as required by revisions in underlying governing law. The revised law necessitated changes in the IBPSA By-Laws and Board of Directors (BoD) election procedures.

The new By-Laws specify that the BoD consist of 10 At-Large Directors (nominated by any two members) plus one Affiliate Director from each affiliate (nominated by the affiliate). Directors will serve for 2 years and half of the Board will be elected each year by the membership.

The officer positions of President, Vice-President, Secretary, and Treasurer are filled by Directors selected by the BoD after each election.

To initiate the new procedures, a new full BoD was elected in the fall of 2014. 1- and 2-year terms were assigned by random selection. The results are listed below.

The next election will be held in the fall of 2015, with half the BoD seats in contention. Notices will be sent to all members and affiliates requesting nominations. The next Annual General Meeting will be held in Hyderabad, India, in association with Building Simulation 2015.

At-Large Directors

2-year terms

- Paul Bannister (Australasia)
- Charles Barnaby (USA)
- Ian Beausoleil-Morrison (Canada)
- Matthias Haase (Nordic)
- Christoph van Treeck (Germany)

1-year terms

- Drury Crawley (USA)
- Lori McElroy (Scotland)
- Andrea Gasparella (Italy)
- Christina Hopfe (England)
- Michael Wetter (USA)

Affiliate Directors

2-year terms

- William O'Brien (Canada)
- Jose Norberto Guerra Ramirez (Chile)
- Martin Bartak (Czech Republic)
- Milorad Bojić (Danube)
- Mohammad Fahmy Ramadan (Egypt)
- Pieter De Wilde (England)
- Christoph Nytsch-Geusen (Germany)
- Donal Finn (Ireland)
- Kwang Woo Kim (Korea)
- Ala Hasan (Nordic)
- Piotr Narowski (Poland)
- Roman Rabenseifer (Slovakia)
- Joseph Deringer (USA)

1-year terms

- Raul Ajmat (Argentina)
- Quentin Jackson (Australasia)
- Nathan Mendes (Brazil)
- Da Yan (China)
- Etienne Wurtz (France)
- Rajan Rawal (India)
- Vincenzo Corrado (Italy)
- Yoshiyuki Shimoda (Japan)
- Wim Plokker (Netherlands + Flanders)
- Nick Kelly (Scotland)
- Gerhard Zweifel (Switzerland)
- Ayşe Zerrin Yilmaz (Turkey)
- Khaled Al-Sallal (UAE)

Projects and work at RWTH Aachen University, Germany

a conversation with Christoph van Treeck and Dirk Müller

We continue ibpsaNEWS's feature describing the work of research institutes, university faculties and other organizations that are actively involved with IBPSA related research. This is intended to provide more insight into organisations around the world and to answer questions that cannot be easily found on a website, to update you about news and openings, or to showcase potential collaboration opportunities.

In the April 2014 ibpsaNEWS Michael Wetter and Phil Haves of the Simulation Research Group at Lawrence Berkeley National Laboratory (LBNL) shared their insights, and in the October 2014 issue we focused on the Building Energy Research Group (BERG) at Loughborough University in England. This time, to discover more about building simulation research and IBPSA-related activities in Germany, Christina Hopfe spoke to Christoph van Treeck, Professor of Energy Efficient Building (E3D) in the Faculty of Civil Engineering, and Dirk Müller, Head of the Institute for Energy Efficient Buildings and Indoor Climate (EBC) in the Faculty of Mechanical Engineering, about IBPSA Germany, the BauSIM conference and their research and projects at RWTH (Rheinisch-Westfälische Technische Hochschule) Aachen University.

The first BauSIM, the regional conference of the German and Austrian Chapter of IBPSA, took place in 2006 in Munich, followed by Kassel (2008), Vienna (2010), and Berlin (2012). The most recent, BauSIM 2014, took place from 22 -24 September 2014 and was organized jointly at RWTH Aachen by E3D and EBC. 179 delegates from 14 different countries attended this 5th BauSIM, which included three keynote speeches, 71 paper presentations, and 23 poster presentations. The overall theme of the conference was "Human-centred buildings", including issues in the field of building and systems performance simulation such as (amongst many others) computational modelling and simulation at multiple scales between occupants, buildings and city quarters; building services; human performance, interactions between light, acoustics, indoor climate and air quality; and (in a special session) the IEA's new Annex 60 project "New Generation Computational Tools for Building and Community Energy Systems".

Christina J Hopfe (CJH): IBPSA Germany was founded in 2004, and currently has 190 members. The most recent conference of the German/Austrian chapter had a large international attendance ranging from Australia to Canada. One of the reasons was that the IBPSA World board meeting took place on the day before the conference opened at RWTH Aachen, but certainly there has been noticeable growth in international interest in this particular conference. From the first event in 2006 to the most recent in 2014, an increasing number of English submissions have been evident now that the conference language is both German and English with one in three sessions held entirely in English. Is this an inevitable trend due to the fact that the international academic language is, by default, English and do you foresee BauSIM becoming solely an English speaking event in the near future?

Christoph van Treeck (CvT): Well, in my opinion, BauSIM will always be – and have to be – a bilingual event. BauSIM needs to attract practitioners and local members of the simulation community to the conference and aims to enable an active dialogue with academia and research. We would not reach these people if the

conference was offered only in English; this was a clear conclusion from a member survey we conducted some years ago where we asked this question. On the other hand, I agree with what you say: English is the academic language and organizing a bilingual event is not easy. Organizers need to find the right balance. In Aachen we did this by organizing one of the parallel conference tracks in English only, and that worked quite well.



BauSIM 2014: keynote lecturers Thomas Hamacher (TU München, left above), Matthias Müller (RWTH Aachen, left below) and Michael Bauer (Drees&Sommer, below centre), and conference chairs Christoph van Treeck and Dirk Müller announcing the prize winners at the conference banquet (below right)



CJH: The conference was organized by your two institutes. Could you introduce these two different groups and explain how they differ and/ or complement each other?

CvT: Dirk and I, and of course our teams, collaborate quite intensively and well in a number of areas where linking the topics across the mechanical and civil engineering faculties makes good sense. We complement each other well in the areas of performance modelling and simulation of building and community energy systems. E3D focuses more on buildings and building physics-related aspects, whilst EBC puts emphasis on energy systems. For example, we are currently collaborating in a project on district modelling and performance optimization, where the entire RWTH Aachen campus with its buildings and energy networks is modelled within a geographical information system in order to develop an energy- and cost-efficient retrofit strategy.

Dirk Müller (DM): Another area where our research teams collaborate well is the indoor environment and its effect on occupants, including work on thermal comfort, air quality and related research. These collaborations also encourage the creation of a common infrastructure between E3D and EBC. Currently, our institutes are building a new shared test facility with a budget of €4M, a test hall for research on human-centred building technology which will enhance the existing test labs of the E.ON Energy Research Center. Additionally, as there are also two teams from the faculty of electrical engineering at the E.ON Energy Research Center we can address all topics relating to future energy systems.

CJH: Could you tell us what sort of on-going projects you have at the moment and whether they are more national or international in focus?

CvT: Of course, both national and international. E3D focuses on modelling and simulation of processes in building physics within the area of energy efficient and sustainable building and operation of buildings, on life cycle (cost) assessment, and on modelling and simulation of the impact of the thermal environment on occupants' thermal physiology and comfort. We are therefore also interested in the interrelations between physiological and

psychological aspects. In this area, we are participating in the international IEA Annex 66 project on occupant modelling, focusing on dynamic stochastic modelling. We are also running several projects in the automotive field, developing new feedback-control systems for cabin climate control in electric vehicles. We collaborate intensively with the automotive industry in both nationally funded research projects and in pure industry projects, and we have recently conducted several empirical studies investigating thermal sensation and comfort. Another area of interest is building and community information modelling (BIM). Supported by a national research project, we are involved in the IEA Annex 60 project on building and community energy performance modelling, where we act as joint Operating Agent, in collaboration with Michael Wetter of LBL.

Thinking
the future.

RWTHAACHEN
UNIVERSITY

DM: EBC's research aims to reduce the energy consumption of buildings and improve the quality of the indoor climate. To this end, our research includes the generation of energy and its distribution, the storage of energy and its release to the room, and the thermal behavior of a single building or a city district. Unlike many other energy approaches typically applied nowadays, the institute uses an exergy-based analytical technology which, in particular, involves sensible utilization chains for energy transformation. This method enables a thermodynamically valid evaluation of the entire energy supply chain, starting from the supply structure and the energy transformation chain and extending down to the energy streams within a building. In all methods for reducing the energy requirements of buildings, our research always compares the costs (energy/exergy) with the benefit (indoor comfort), so that new concepts for the supply of buildings can be compared with existing solutions and be further developed to meet future requirements.

CJH: How many PhD students/ postdocs do you have currently working in the two different groups? Will there be any new openings in the near future?

CvT: At E3D, we currently have one chief engineer (postdoc), 14 full-time research associates and one guest researcher (all PhD students), five non-academic staff and two software developer trainees; there are a further seven associated PhD students and around 20 associated student workers. E3D was founded in 2012 as a new institute. The E3D team is interdisciplinary and consists of civil, computational, mechanical, industrial, electrical and biomedical engineers, a mathematician, an architect and computer scientists. This spread is necessary in order to work on all these topics.

DM: At EBC there are currently two chief engineers (postdocs), 40 full-time research associates and one guest researcher (all PhD students), nine non-academic staff and two software developer trainees, and around 60 associated student workers. The institute was founded in 2007 as one of the five institutes of the E.ON Energy Research Center. The majority of the researchers in the EBC team are Master graduates of mechanical engineering.

New openings are usually announced via our web sites - or sometimes directly communicated to talented young researchers... ;-)

CJH: What would you say is, or are, your (greatest) asset(s)? This might include a particular knowledge base, or specific lab equipment, or some key software development or personnel?

DM: In recent years many research projects at EBC have focused on future urban energy systems. It is certainly true that large-scale power plants can achieve higher efficiency than smaller energy conversion units. The main advantage of small and locally established energy conversion units is a better use of waste heat. Almost every form

of energy conversion produces a considerable amount of waste heat. In central power plants, waste heat can only be used in conjunction with a district heating network. If a district heating system is not available, waste heat is dispersed to the environment through cooling towers. If many smaller energy conversion units are operated in an urban environment, waste heat can be used locally to heat one or more buildings. In summer it is also possible to provide cooling energy via sorption technology. We can therefore use any kind of fuel more efficiently. Apart from reducing the demand on the central electricity grid, this is the main advantage of a decentralized energy supply.

Small energy conversion units can also be easily connected to local energy storage based simply on water, on latent heat, or on chemical storage. Or we can use the existing mass of buildings for free. These small-scale storage units add up to a large storage capacity that can be used locally or centrally like a virtual power plant. This storage capacity can make a significant contribution to the integration of renewables into our energy system today.

We cannot control the sun and the wind, so we need to adapt to the power production characteristics of photovoltaic systems and wind turbines. In the event of a power shortage, we can shut off heat pumps and turn on our combined heat and power generation units. If we have excess electricity, we can switch on heat pumps and direct electrical heaters. This demand-side management leads to more flexibility in usage and needs to be considered alongside potential improvements in energy efficiency. This example also shows that we will need more information and communication technology in building supply systems. Thanks to our cooperation with our colleagues from electrical engineering we are able to inject new ideas and adopt new approaches to these tasks.

I am very grateful that we are taking an active part in these fundamental changes to our energy systems through public and industry-funded projects. Many of these projects require intensive energy systems simulations. In 2014, we published our open source Modelica library "AixLib" for the detailed modelling of building physics and HVAC systems. This will enable new research collaborations and ensure an ongoing development process. But I am also very pleased that, in addition to all the simulation work, we have some other projects that deal with real machines and equipment. Engineers need real hardware!

CJH: Where do you expect your institution to be in 5 years' and in 20 years' time? Are you aiming for organic growth or are you actively seeking more expertise in a different area?

CvT: This is quite an interesting question. Work on the topics we have already mentioned in a cross-disciplinary manner necessarily requires a team of commensurate size. At present we are quite happy with the size of the team, and our concept of academic research in a university team requires that one is acquainted with the people and the content of their research. On the other hand, we all know that this is not easy if the team size grows organically. Our approach to this dilemma is to have organized teams with people responsible for project coordination, post doc researchers managing the research teams and, most importantly, to actively collaborate to avoid duplications and duplicated effort.

Based on our experience research topics will change every five to seven years. This will keep us busy! We have to adapt to upcoming questions and methods and we will enjoy all of our new experiments and findings.

CJH: Thank both for a very informative conversation.

If you would like to know more about RWTH Aachen University and its work, visit www.rwth-aachen.de, and if you are interested in publicising the work of your faculty or research group, please contact Christina Hopfe (C.J.Hopfe@lboro.ac.uk). ■

Forthcoming events

Date(s)	Event	Web site
2015		
14-17 June 2015	IBPC 2015: 6th International Conference on Building Physics for a Sustainable Environment Turin, Italy	www.ibpc2015.org
27 June - 01 July 2015	ASHRAE 2015 Annual Conference Atlanta, Georgia, USA	http://ashraem.confex.com/ashraem/s15/cfp.cgi
01-03 July 2015	7th International conference on Sustainability in Energy and Buildings Lisbon, Portugal	http://seb-15.sustainedenergy.org
30 September – 2 October 2015	2015 ASHRAE Energy Modeling Conference Atlanta, Georgia, USA	https://www.ashrae.org/membership-conferences/conferences/ashrae-conferences/2015-ashrae-energy-modeling-conference
07-09 December 2015	BS2015 Hyderabad, India	www.bs2015.in
2016		
07-10 April 2016	9th Windsor Conference Windsor, UK	http://windsorconference.com
12-14 September 2016	Building Simulation and Optimization BSO16 Newcastle upon Tyne, UK	www.bso16.org

Note that the dates in this calendar may, but do not necessarily, include pre and/or post-conference workshop days

14-17 June 2015 Turin, Italy www.ibpc2015.org

IBPC 2015: 6th International Conference on Building Physics for a Sustainable Environment

The International Building Physics Conference (IBPC) takes place every 3 years and is organized by the International Association of Building Physics (IABP). IBPC 2015 will take place in the lively city of Turin, hosted by Politecnico di Torino and co-organized by ATI Piemonte and the Politecnico di Torino's Department of Energy

IBPC 2015 will provide a forum for scientists, researchers and practitioners from all over the world to disseminate technical information, new ideas, and the latest developments, and to discuss future directions in the fields of building physics.

Topics will include energy efficient design and retrofit of buildings, indoor environment control for comfort and/or preservation, IAQ and ventilation, building and architectural acoustics, noise control, lighting, visual and acoustic comfort, building materials and components, the energy and economic sustainability of high performance buildings, and optimization and modelling techniques, as well as a broad range of building integrated RES (Renewable Energy Sources) and Zero Energy Buildings.

In addition to presentations of technical papers, IBPC 2015 will include expert keynote talks, workshops, special sessions for IEA and EU research projects, and doctoral student seminars.

Further information about the programme and the venue is available from the conference website, www.ibpc.org. ■

01-03 July 2015

Lisbon, Portugal

<http://seb-15.sustainedenergy.org>



SEB-15: Sustainability in Energy and Buildings

SEB-15, the Seventh International Conference on Sustainability in Energy and Buildings, will take place in the vibrant city of Lisbon, Portugal. Organised by the UNINOVA research institute group at Universidade Nova de Lisbon, (the New University of Lisbon) in partnership with KES International, it aims to bring together researchers and government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective.

The conference will have four main tracks: **Sustainable Buildings** (chaired by John Littlewood, Cardiff Metropolitan University, Wales, UK), **Energy Systems and Cities** (chaired by Catalina Spataru, University College London, UK), **Renewable Energy Technologies, Applications and Integration** (chaired by Mahieddine Emziane, MASDAR Institute of Science and Technology, Abu Dhabi, UAE) and **Energy and Resource Efficiency in Industry** (chaired by Ana Rita Campos, UNINOVA, Portugal). More details of these can be found on the website, <http://seb-15.sustainedenergy.org>. ■

In addition to presentations of full and short papers in general tracks and invited session tracks, SEB-15 will also include expert keynote talks, doctoral student poster sessions and workshops.

Papers presented may be published after the conference in Elsevier's *Procedia Energy* open access journal, which is available in ScienceDirect and submitted to be indexed/abstracted in Scopus. ■

**07-09 December
2015**

Hyderabad, India
www.bs2015.in



The International Building Performance Simulation Association's 14th international conference will be held in India, in Hyderabad, the country's 6th most populous city, with a rich mix of academic institutes and industries. BS 2015 will bring together academics, researchers and professionals from a broad range of science and engineering disciplines with the aim of sharing the latest technology and innovations and spearheading the practical application of building simulation in developing nations. The International Institute of Information Technology – Hyderabad (IIITH) is acting as secretariat.



India is the second-fastest growing economy in the world and its construction sector is the country's second-largest economic activity, so we expect this conference to attract a rich mix of local and international participants.

BS 2015 will feature a wide range of topics such as:

- Thermal simulation
- Thermal comfort
- Daylight simulation
- Simulation of natural ventilation
- Simulation for passive measures
- Building-integrated photovoltaic systems
- Simulation for Code compliance
- Urban Scale simulation



The conference programme will include both oral presentations with question-and-answer sessions and poster sessions. There will be workshops on the energy performance of buildings and other building-related aspects such as acoustics, fire and water both before and after the main conference.



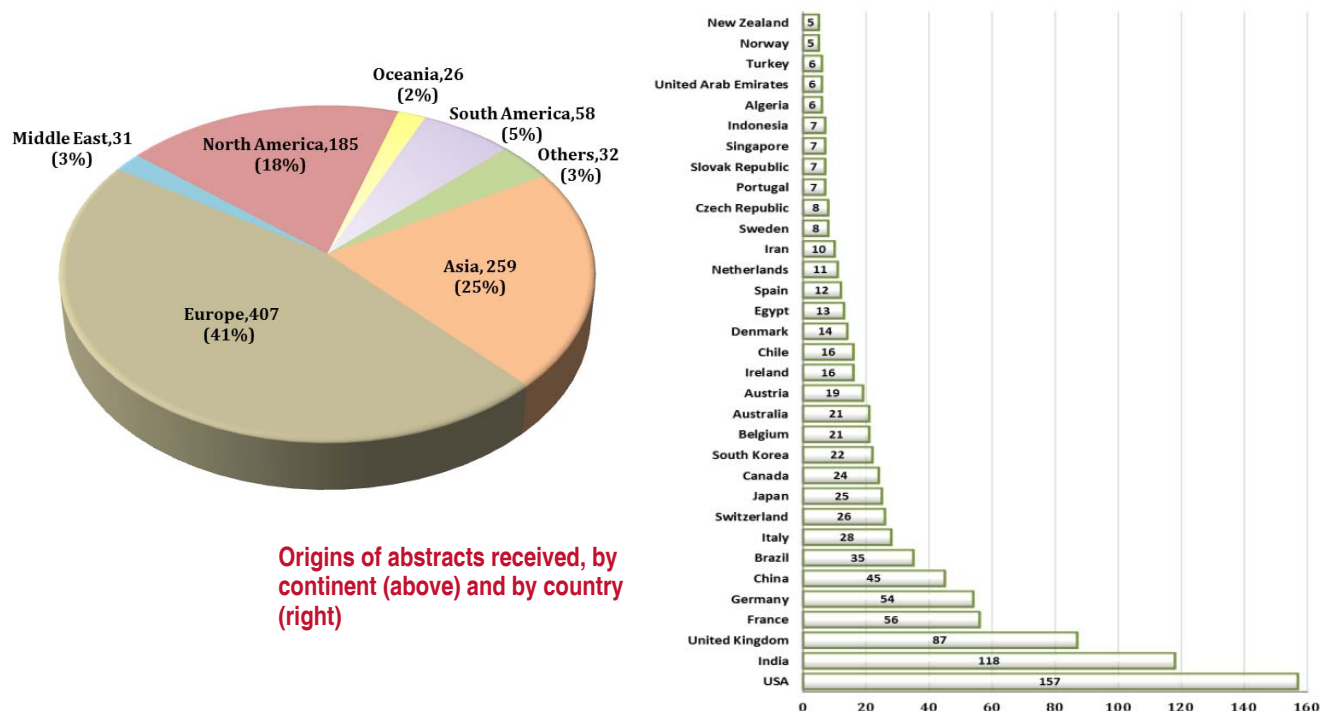
Conference venue

Hyderabad is emerging as a global hub for Information Technology, and the industry's growth is driving both commercial and residential construction. Hyderabad also leads the green building movement in India, with the local presence of the Indian Green Building Council, and it has a rich heritage of UNESCO Asia-Pacific historical sites.

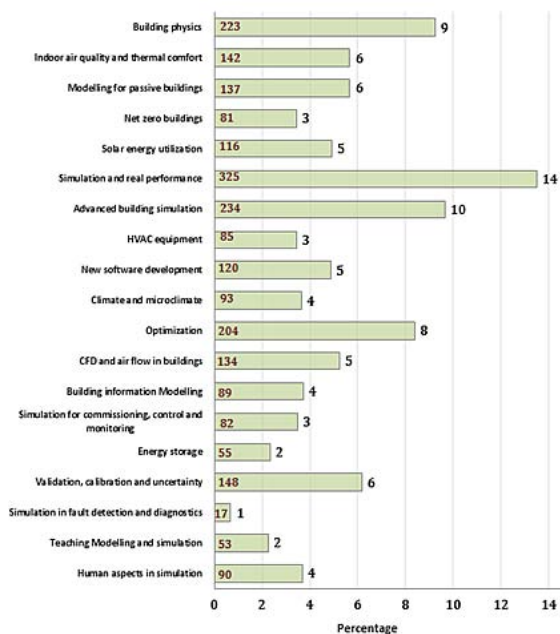
BS2015 will be held at the state-of-the-art Hyderabad International Convention Centre (HICC), which has space for 32 breakout sessions, and the keynote session hall can accommodate over 1000 delegates.

Progress

We are pleased to announce that work towards BS2015 is shaping up well. With submissions of abstract and final papers now closed, we have received an overwhelming response to the Call for Papers with 998 abstracts received from 64 countries worldwide:



There are 19 different tracks for paper submission; the track for which most abstracts have been received is 'Simulation and real Performance' (14%):



The online registration facility should be available for you to register under the Early Bird offer shortly. Please visit www.bs2015.in for regular updates relevant to the conference. We are also in process of negotiating with a few hotels in Hyderabad, in and around the conference venue, to ensure a comfortable stay for you while in India.

As part of Building Simulation 2015, IBPSA is also organizing a student modelling competition. The aim is to facilitate wider participation in the conference and provide a competitive forum for student members of the building simulation community. We have received an overwhelming response to the student modelling competition from around the world. Two awards will be presented: one for individual entrants and a second for group entrants. The individual winner will be given a complimentary registration along with the prize money of \$500US and a certificate. For the winning group entry, up to two group members will be given complimentary registrations along with the prize money of \$500US for the group. All members of the winning group will be given certificates. The conference is proving very popular with students, and they have submitted nearly half of all the abstracts received.

The IBPSA Conference has support from organizations such as ASHRAE, ISHRAE, Indian Green Building Council, Administrative Staff College of India and Malaviya National Institute of Technology. Autodesk has also confirmed its participation as a Platinum Sponsor.

The 3 day program will provide an enriching experience for participants in this knowledge fair. We look forward to receiving you in Hyderabad, the city of smiles, lights, a thousand faces, and endearingly called the Pearl City. Hyderabad offers a variety of tourist attractions ranging from heritage monuments, lakes and parks, gardens and resorts, and museums to delectable cuisine and a delightful shopping experience.

Key dates for authors

The dates for submission of abstracts and full papers have passed. Those that remain are:

- Notification of provisional acceptance/rejection of full papers: 15 June 2015
 - Submission of final papers: 1 July 2015
 - Notification of final acceptance/rejection of final papers: 1 September 2015 ■
-

www.bs2015.in



IBPSA
BUILDING
SIMULATION
CONFERENCE
2015
HYDERABAD
DECEMBER 7 - 9, 2015

**14th INTERNATIONAL
CONFERENCE OF THE
International
Building
Performance
Simulation
Association**

Dec 7 - 9, 2015
Hyderabad, India

Key Dates

Abstract Submission Opens
September 10, 2014

Abstract Submission Closes
November 15, 2014

Abstract Acceptance Notification
January 31, 2015

Submission of Full Length
Papers Closes
April 15, 2015

Notification of Provisional
Acceptance/Rejection of Full Papers
June 15, 2015

Submission of Final Papers
July 01, 2015

Notification of Final Acceptance of
Papers
September 01, 2015

Conference Dates
December 7 - 9, 2015

Call for Papers

The overall objective of **Building Simulation 2015** is to advance the practice in diverse disciplines of building energy analysis and performance simulation. Paper abstracts are invited across a variety of fields, including the following streams:

- Building physics
- Indoor air quality and thermal comfort
- Modelling for passive buildings
- Net zero buildings
- Solar energy utilization
- Simulation and real performance
- Advanced building simulation
- HVAC equipment
- New software development
- Climate and microclimate
- Optimization
- CFD and air flow in buildings
- Building information modelling
- Simulation for commissioning, control and monitoring
- Energy storage
- Validation, calibration and uncertainty
- Teaching modelling and simulation
- Simulation in fault detection and diagnostics
- Human aspects in simulation

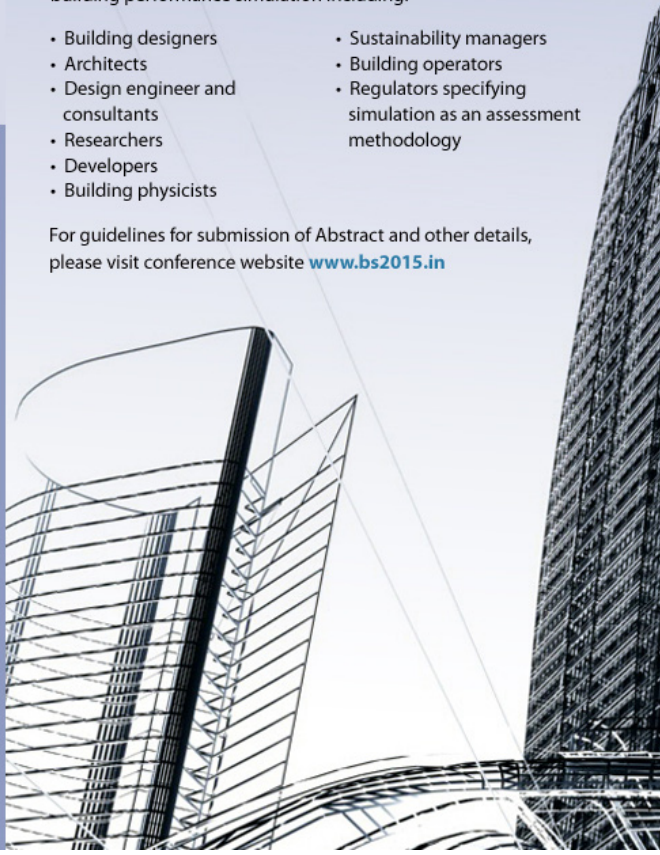
All submissions will be peer reviewed and acceptance would be based on their quality and relevance to the conference topics.

Who Should Attend

The conference is for anyone working in or learning about the field of building performance simulation including:

- Building designers
- Architects
- Design engineer and consultants
- Researchers
- Developers
- Building physicists
- Sustainability managers
- Building operators
- Regulators specifying simulation as an assessment methodology

For guidelines for submission of Abstract and other details, please visit conference website www.bs2015.in



**12-14 September
2016**

Newcastle, UK
www.bso16.org



BSO 2016: 3rd IBPSA-England conference

IBPSA-England announces its 3rd conference, Building Simulation & Optimization 2016, which will be held at the University of Newcastle on 12-14 September 2016.

The built environment's impact on climate, human wellbeing and natural resources underpins an increasing demand for building and urban performance modelling. The role of performance modelling has expanded from facilitating energy regulatory compliance to enabling a wider discourse on how designed buildings, from a single building to the urban scale, are predicted to perform before they are actually built. Although advances in building and urban simulation tools have leapt forward in terms of their computational power and data visualization capabilities there are still major challenges relating to data integration and interpretation. This conference seeks to explore the extent of these simulation challenges and demonstrate how optimization techniques can be used systematically to inform optimized design and operation strategies.

BSO16 conference themes

- Progress in simulation tools and optimization methods
- Application of environmental and sustainability modelling to case studies
- New directions in building environmental modelling including BIM and visualization methods
- Progress in modelling micro-urban environments

Key dates

- Conference website with further details activated: 15 April 2015
- Abstract submission: 01 November 2015
- Full paper submission: 13 March 2016
- Final decision to authors: 30 July 2016
- Early bird registration: 15 August - 04 September 2016

Organisers

Conference Chair: Dr Neveen Hamza, Newcastle University (Vice Chair, IBPSA-England)

Conference Executive Organising Committee: Dr. Neveen Hamza; Prof Chris Underwood, Northumbria University; Prof Malcolm Cook, Loughborough University; Prof Dejan Mumovic, The Bartlett, UCL; Prof Pieter De Wilde, Plymouth University (Chair, IBPSA-England)

Chair of Scientific Committee: Prof Chris Underwood

Conference Executive Scientific Committee: Prof Jon Wright, Loughborough University; Prof Malcolm Cook; Prof Pieter De Wilde; Dr Neveen Hamza; Prof Dejan Mumovic. ■

Building Performance Simulation for Design and Operation

Jan L.M. Hensen and Roberto Lamberts

Effective building performance simulation can reduce the environmental impact of the built environment, improve indoor quality and productivity, and facilitate future innovation and technological progress in construction. It draws on many disciplines, including physics, mathematics, material science, biophysics and human behavioural, environmental and computational sciences. The discipline itself is continuously evolving and maturing, and improvements in model robustness and fidelity are constantly being made. This has sparked a new agenda focusing on the effectiveness of simulation in building life-cycle processes.

Building Performance Simulation for Design and Operation begins with an introduction to the concepts of performance indicators and targets, followed by a discussion on the role of building simulation in performance-based building design and operation. This sets the ground for in-depth discussion of performance prediction for energy demand, indoor environmental quality (including thermal, visual, indoor air quality and moisture phenomena), HVAC and renewable system performance, urban level modelling, building operational optimization and automation.

Produced in cooperation with the International Building Performance Simulation Association (IBPSA), and featuring contributions from fourteen internationally recognised experts in this field, this book provides a unique and comprehensive overview of building performance simulation for the complete building life-cycle from conception to demolition. It is primarily intended for advanced students in building services engineering, and in architectural, environmental or mechanical engineering; and will be useful for building and systems designers and operators.

Selected Table of Contents

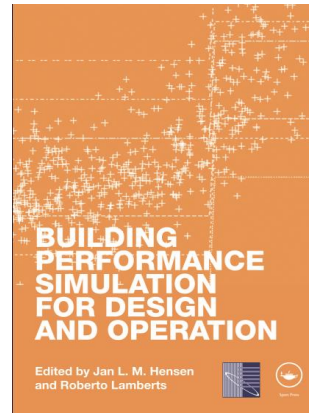
1. The Role of Simulation in Performance Based Building 2. Weather Data for Building Performance Simulation 3. People in Building Performance Simulation 4. Thermal Load and Energy Performance Prediction 5. Ventilation Performance Prediction 6. Indoor Thermal Quality Performance Prediction 7. Room Acoustics Performance Prediction 8. Daylight Performance Predictions 9. Moisture Phenomena in Whole Building Performance Prediction 10. HVAC Systems Performance Prediction 11. Micro-cogeneration System Performance Prediction 12. Building Simulation for Practical Operational Optimization 13. Building Simulation in Building Automation Systems 14. Integrated Resource Flow Modelling of the Urban Built Environment 15. Building Simulation for Policy Support 16. A View on Future Building System Modelling and Simulation

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About the Authors

Jan L. M. Hensen (Ph.D. & M.S., Eindhoven University of Technology) has his background in building physics and mechanical engineering. His professional interest is performance-based design in the interdisciplinary area of building physics, indoor environment and building systems. His teaching and research focuses on the development and application of computational building performance modelling and simulation for high performance.

Roberto Lamberts is a Professor in Construction at the Department of Civil Engineering of the Federal University of Santa Catarina, Brazil. He is also currently a board member of the IBPSA, Vice-President of the Brazilian Session and Counsellor of the Brazilian Council for Sustainable Buildings.



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Software news



CommONEnergy: an Integrated Modelling Environment for shopping malls

*Annamaria Belleri, Chiara Dipasquale and Roberto Lollini, Eurac, Italy
Matthias Haase, Sintef, Norway*

The planning of a high-quality retrofit requires several different aspects to be taken into consideration simultaneously: climate and location, architecture, and the selection of HVAC, lighting, refrigeration, renewable energy sources and storage systems. Due to the variety of systems present in shopping malls, their retrofitting needs a decision process based on a comprehensive approach which considers the actual energy performance of the building, climate, management and user behaviour.

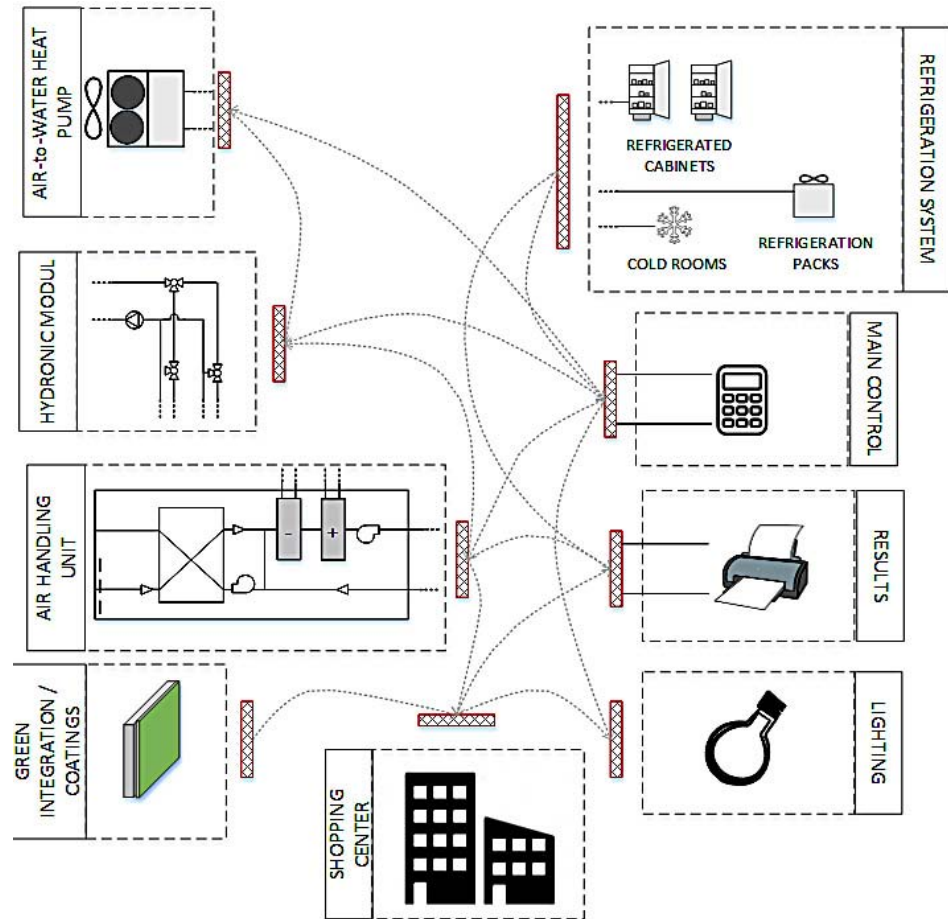
Building energy simulations allow effective retrofitting solutions to be identified and the associated energy savings, power requirement profile and impact on comfort assessed. Simulation is already widely used in the design of other types of building, but its use in shopping malls is still rather new due to their complexity: thermal zones with different uses, interaction between several components and technologies, and a variety of different scenarios and control strategies all need to be considered. The development of energy models for this kind of building can be time consuming due to the need to:

- develop numerical models for several technologies specific to shopping malls (cold cabinets, cold rooms, booster systems...)
- define inputs and schedules for the different types of thermal zones (shops, common areas, food stores, restaurants, parking...)
- identify a common nomenclature for all contributors to the model development
- manage the different systems in a consistent way.

This challenge is being addressed within the EU's FP7 CommONEnergy project — Converting EU Shopping Malls Into Beacons Of Energy Efficiency, www.commonenergyproject.eu — where an Integrated Modelling Environment (IME) based on the Trnsys simulation software is under development to support the retrofitting phases (auditing, design, construction, commissioning and operation) of shopping malls. The IME gathers together in the same simulation model:

- building
- HVAC and refrigeration systems and components
- daylighting/shading/lighting
- storage technologies
- renewable energy technologies
- natural ventilation and infiltration
- unconventional envelope solutions (vegetation, multi-functional coating and materials, etc.).

The whole building system is divided into base blocks (both passive and active components as well as subsystems) to provide a user-friendly modelling environment. Technologies are considered as building blocks which will make up the building model: base elements are joined at system level and systems are joined at building level.



The modularity of the IME allows the user, with reduced modelling effort, to:

- characterize the energy savings of shopping mall retrofitting scenarios to support decisions at different design stages;
- define and optimize control algorithms at whole building and/or sub-system level;
- address optimal scenarios by overall energy system parameterization.
- optimize installed power.

The modular structure of Trnsys is a key factor in the IME. Every component or technology can be developed independently from the other parts of the building model and then gathered together into sub-systems. The IME allows a collaborative development of components and several partners are contributing, many of them — including Eurac, Sintef, and Uni Udine — belonging to IBPSA affiliates, including Italy and Nordic. ■



DesignBuilder software update

DesignBuilder provides advanced modelling tools in a graphical user interface for simulation engines such as EnergyPlus and Radiance in addition to our own CFD engine and national code compliance tools such as SBEM in UK and RT2012 in France. This enables fully integrated building performance modelling. DesignBuilder are pleased to announce a number of significant improvements in our latest version, including:

- Many Detailed HVAC additions and improvements: VRF including free tools and documentation for users to add manufacturer's data as curves to model EnergyPlus VRF systems (usable for all EnergyPlus interfaces); Water to air heat pumps in unitary and zone units; Air to water heat pumps; Water side economiser; Dry cooler; District heating and cooling. An example of one of the many pre-configured EnergyPlus Detailed HVAC templates available in DesignBuilder is shown in Figure 1, with the curve generation tool shown in Figure 2:

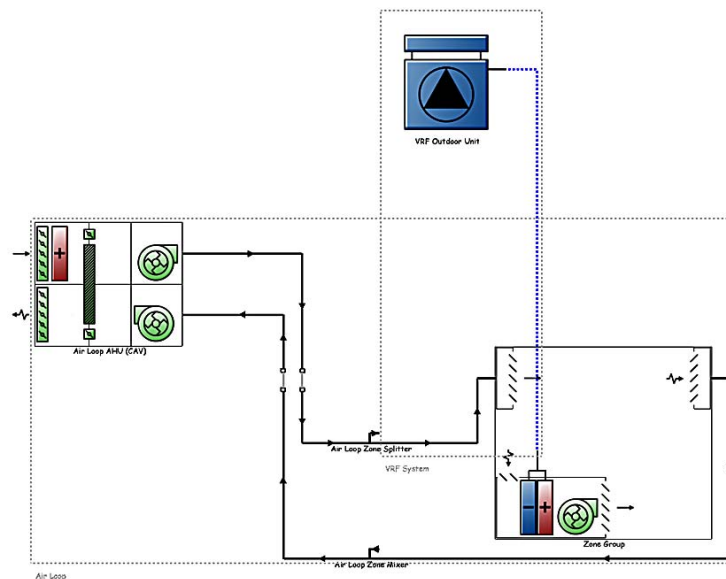


Fig 1: Pre-Configured DesTemplate for VRF with DOAS Heat Recovery AHU

EIRRatioCurves Table 2: Cooling energy input ratio modifier function of temperature data									
OER (°C)	IWB (°C)								
	13.89	16.11	17.78	19.44	21.11	22.22	23.89		
	EIRFT	EIRFT	EIRFT	EIRFT	EIRFT	EIRFT	EIRFT		
10.00	0.563719586	0.552367029	0.541670037	0.525716695	0.536454717	0.530259689	0.532488967		
12.22	0.578586915	0.566978564	0.556007044	0.53920742	0.549548856	0.544416037	0.544759786		
14.44	0.600288428	0.588222996	0.577064528	0.558600337	0.57018153	0.564711468	0.563346035		
15.56	0.620711016	0.607603732	0.59632876	0.58111298	0.58646543	0.582514477	0.579634746		
17.78	0.641153595	0.626884668	0.615559228	0.60623946	0.603511556	0.600317487	0.59578656		
19.44	0.67274667	0.657108324	0.645185005	0.634845666	0.63096221	0.627744127	0.621615864		
21.11	0.692599777	0.67638906	0.664430638	0.652613828	0.647554806	0.643181071	0.638405533		
22.22	0.728499157	0.710260623	0.697584886	0.684232715	0.677313759	0.67546168	0.67141451		
25.00	0.776817978	0.756117508	0.742388132	0.726812816	0.71778594	0.71603705	0.70946111		
26.67	0.836297297	0.812396413	0.79704797	0.779080376	0.76817776	0.766241537	0.76141448		
28.89	0.893278728	0.866590914	0.849467652	0.828836425	0.815395296	0.812529361	0.80100705		
31.11	0.955225935	0.924433122	0.905471584	0.88237774	0.86618393	0.86202171	0.849121874		
33.33	1.023367863	0.988528541	0.967747957	0.940978078	0.92372895	0.91608572	0.905010148		
35.00	1.09366207	1.053666162	1.029576298	1	0.9777084	0.96951565	0.954444848		
37.22	1.18876606	1.14253337	1.114702277	1.044028148	1.026277274	1.0435025	1.02841408		
39.44	1.26200915	1.213123059	1.178618603	1.087484841	1.115151088	1.097444062	1.082845768		
41.67	1.396666666	1.346666666	1.310232149	1.1890755	1.280381096	1.2680814	1.251571186		
43.89	1.52121515	1.443186384	1.385148181	1.310154174	1.3013412	1.279887272	1.2443118		
46.11	1.647990002	1.55721402	1.479268847	1.386107542	1.386145375	1.347821357	1.318414134		
47.78	1.656529945	1.558262648	1.480310015	1.400010015	1.400010015	1.368484848	1.339000000		

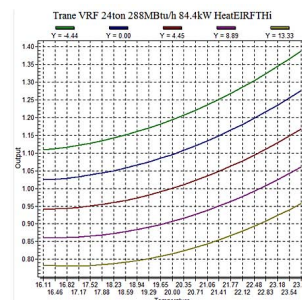


Fig 2: Curves generated with the free EnergyPlus VRF coefficient generator tool

- Implementation of the EnergyPlus Energy Management System (EMS). The EMS is one of the high-level EnergyPlus control methods available to access a wide variety of “sensor” data and use this data to direct various types of control action. The EMS allows the functionality of many of the existing high-level control objects to be overridden, such as overriding schedules to switch on and off HVAC components and adjusting their performance characteristics. One example would be overriding the default control linkage between an economiser and heat recovery. It also provides more precise control over simulated behaviour for systems such as enabling you to link earth tubes to HVAC air inlets. DesignBuilder makes using the EMS much simpler and includes some important extensions to the standard EnergyPlus EMS and Etl system allowing DesignBuilder EMS programs to be reused and shared. A presentation explaining DesignBuilder’s EMS application can be found here: www.designbuilder.co.uk/downloads/DesignBuilderEMSDemo.pdf and via our fully integrated Help file here: www.designbuilder.co.uk/helpv4.3/.
- Combined heat and moisture simulations with options for both EMPD and HAMT.
- Option to simulate using EnergyPlus v8.2.
- BIM import of thermal properties (constructions, materials, glazing).
- Improvements for LEED and ASHRAE 90.1 modelling.
- Panes database upgraded for IGDB v37.
- Simple generation of CIBSE TM52 overheating outputs.
- New hourly weather data listings for Australia (NATHERs), Portugal (LNEG), Germany (DWD) and UK (CIBSE).
- High performance EnergyPlus cloud simulations through integration with the JESS remote server.
- Optimisation improvements including a new option to allow the same variable type to be applied to multiple places in the model (e.g. find optimal glazing type on different facades). An example optimisation output is shown in Figure 3:

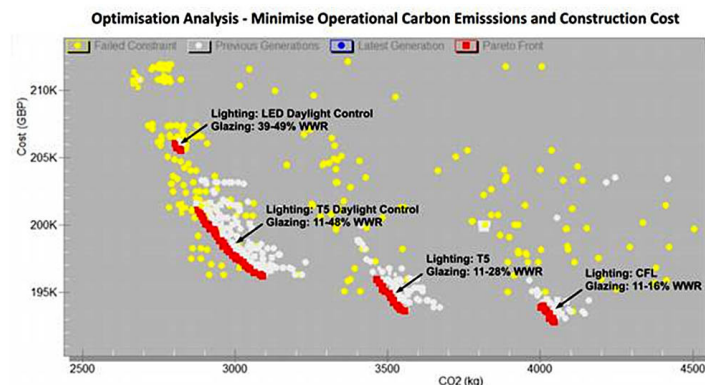


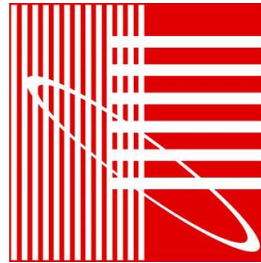
Fig 3: Example multi-criteria cost-benefit output from optimisation study

DesignBuilder run simulation training which is fully modular so you can choose which days to attend based on your own expertise. For more details on our extensive international training programme, visit www.designbuilder.co.uk/content/view/78/115/. ■

IBPSA announcements

Fly the IBPSA colors!

Looking for more ways to show your support for IBPSA? Become an IBPSA Supporting Member or Student Supporting Member. Supporting members provide concrete financial support for IBPSA and receive several benefits: a print subscription to the Journal of Building Performance Simulation, online access to the Journal, and the right to use the IBPSA Supporting Member logo.



**IBPSA
SUPPORTING
MEMBER
2015**

Supporting memberships run on a calendar year basis and you can sign up now for 2015 via the Supporting Members link on the IBPSA home page. (Or go directly to the membership site: <http://ibpsa.wildapricot.org>). For 2015, Supporting Membership dues are set at US\$120/year and Student Supporting Membership is \$80/year. Dues payment can be made via PayPal or credit card.

The Supporting Membership grade does not alter the traditional system that automatically confers membership via membership in an affiliate organization. Instead, the new grade provides an additional way to help IBPSA while receiving benefits and recognition.

Questions may be addressed to the chair of the Membership Development Committee, Jeff Spitler (spitler@okstate.edu). ■

Student Travel Awards – supporting students to attend BS2015

Travel to IBPSA Conferences can be an expensive business — especially for students. In order to assist as many students as possible to participate in BS 2015 in Hyderabad, India, IBPSA will grant a number of travel awards of up to US\$1000 to students presenting papers. The number of places is limited to a maximum of 5 grants and as a result is highly competitive.

The selection committee bases its decisions upon the following selection criteria:

- need for financial assistance, evidenced in a letter of recommendation from the student's supervisor/ advisor of studies (must be on university letterhead);
- overall quality of the paper;
- relevance of contribution to the field of and/or furthering the effective application of building simulation.

To be eligible:

- the student must be enrolled in a graduate programme related to building simulation at the time of the conference; AND
- the thesis project must be directly related to building simulation.

Applications MUST be supported by a letter of recommendation from the student's supervisor/ advisor / director of studies.

Applications for the award must be made by 15 April 2015 (same date as the deadline for full paper submission) via e-mail to **pieter.dewilde@plymouth.ac.uk**. The subject heading of the e-mail should be "Student Travel Award" followed by the name of the student.

The e-mail application must include the following:

- The student's name;
- The name of the programme, department, faculty, and university;
- The title of the PhD or Master's research;
- The name of the student's supervisor(s)/ advisor(s);
- The faculty recommendation letter on university letterhead in PDF format.

The selection committee will base its decision upon a review of the letters of support and the final manuscripts. Therefore, to be eligible the student MUST submit the paper by the full paper deadline of 15 April 2015.

IBPSA would like as many nominations as possible, so please contact the chair of the Awards and Fellows Committee, Pieter de Wilde, via **pieter.dewilde@plymouth.ac.uk** to discuss a possible nomination if required.

Payment will be made either to the academic department before the conference or directly to the student at the conference. ■

News from IBPSA affiliates

IBPSA affiliates are asked to submit a report to the IBPSA Board each year to keep Board members informed about their activities and membership. These are too detailed to include in ibpsaNEWS, so affiliates have been asked to make their latest annual report available through their web sites, and this section includes only selected, recent news. Other news from affiliates may be available from their websites; the URLs for these are available on the IBPSA Central web site at www.ibpsa.org/?page_id=29.

IBPSA-Canada

Liam O'Brien, President, IBPSA-Canada

IBPSA-Canada has had a busy year with its largest ever eSim conference last year and formation of three new local chapters: in the Greater Toronto and Hamilton Area, British Columbia, and Ottawa. IBPSA-Canada strives to continue providing services to and representing the large community of at least 700 BPS users, researchers, and developers in Canada.

IBPSA-Canada successfully hosted the 8th biennial eSim building simulation conference in Ottawa last May. The conference grew to a record size of 72 papers, covering a wide variety of topics from daylighting, net-zero energy buildings, and occupant behaviour, to ESP-r simulation on palm-sized computers (courtesy of Jon Hand). In all, 150 delegates attended eSim with representation from 10 countries and five continents. eSim 2014 had the rather unusual venue of a former church, St. Brigid's Centre for Arts, in Ottawa's main entertainment district. The nature of the 150 year old building stimulated many conversations on daylighting, infiltration, and thermal comfort.

In addition to the two day academic conference, there were seven workshops hosted mainly at Carleton University that were exceptionally well attended with about 140 participants. Topics ranged from occupant behaviour and indoor environmental quality led by myself to ESP-r/TRNSYS Co-simulation taught by Profs. Beausoleil-Morrison and Kummert. Other workshops included OpenStudio taught by National Renewable Energy Laboratory (NREL) researchers, eQuest/CanQuest taught by MMM Group and Natural Resources Canada, IES VE taught by IES experts, and a workshop on digitizing existing buildings led by Mario Santana.



Scenes from eSim 2014:

Opening speech by Liam O'Brien, eSim 2014 Chair (top)

eSim 2014 reception volunteers, from left: Burak Gunay, Isis Bennet and Breagh Peel (middle)

Presentation of awards by eSim organizers; from left to right: Lukas Swan, IBPSA-Canada Past President, Jeff Blake, IBPSA-Canada Secretary, Ted Kesik, eSim Co-chair and IBPSA-Canada board member, and Liam O'Brien, IBPSA-Canada President (bottom)

A special thanks to all those who attended eSim and the workshops, the IBPSA-Canada Board, all the volunteers, and the generous sponsors! eSim 2016 is slated to occur in Hamilton (just outside of Toronto) in mid-May. A call for abstracts will be made in summer 2015.

In the meantime, three local IBPSA-Canada chapters have formed in order to facilitate more frequent events and local networking among professionals.

The first to form was the Greater Toronto and Hamilton Area (GTHA) Chapter (<http://gtha.ibpsa.ca>), which captures a population of close to 8 million. Starting in 2014, various working groups have been organized to undertake the following activities: Recommended Site Energy Use Intensity Guidelines for Architects and Owners; Chart of Compliance Paths and Associated Energy Modeling Requirements for OBC, TGS, LEED, HPNC and Savings by Design; Best Practice Guidelines - Energy Modeling and Reporting; Energy Modeling Database (voluntary reporting of key performance metrics); and Advocacy and Outreach (GTHA Chapter website). In addition to these ongoing projects, the GTHA chapter is engaged with the High Performance New Construction and Savings by Design demand management programs in Ontario to provide suggestions on more effective guidelines and protocols for energy modelling. The outcome of these activities will be a series of helpful resources for energy modellers on the GTHA website.

Next, the Vancouver Chapter (<http://bc.ibpsa.ca>) formed in 2013, in which the focus is on education and advocacy for building simulation. The Chapter is actively engaged with the simulation community through various events, courses and workshops that are organized by local educational institutions and utilities. The external communication group has reached all professional associations in British Columbia and all municipalities with developed green building policies. Their education group has organized a panel discussion event called “Demystifying the Black Box –Energy Modelling Process and Best Practices”. The seminar uncovered common communication barriers within teams, and facilitated the understanding of how energy modelling can be used at different stages of design (i.e. concept design, schematic design, design development and construction) to meet sustainability goals at a reduced capital cost.

The IBPSA-Ottawa Chapter held its inaugural meeting on January 8th, 2015 at Carleton University. They hosted three great speakers: Alex Ferguson (Natural Resources Canada), Burak Gunay (Carleton University) and Clément Guénard (Arborus Consulting). IBPSA-Ottawa is committed to facilitating and fostering on-going collaboration and communication between all forms of building simulation practitioners in the Ottawa Valley region. This chapter has committed to a diversified speaker list of junior researchers/industry members, senior researchers (university/government) and senior industry members. Roughly 30 people were in attendance from government, academia and industry. Coincidentally, participants included the IBPSA-World past president, IBPSA-Canada president and IBPSA-Ottawa leadership! A second meeting in March continued the trend of great speakers and a solid participant turn-out. They will continue to meet on a bi-monthly basis throughout 2015. ■

IBPSA-Egypt

On 10 March 2015 IBPSA-Egypt and The American University in Cairo staged a one-day Eco-Research Forum to provide a platform to celebrate today’s Egyptian architects, for researchers to present their work, and for delegates to network. Four sessions addressed indoor and outdoor environmental research, daylighting and visual comfort, and sustainable housing design. There is further information about IBPSA-Egypt’s activities in their latest (March 2015) newsletter, at <http://eeer-ibpsaegypt.wix.com/home#!newsletter/c16s4> . ■

IBPSA-Italy

New board for IBPSA-Italy

The new board of IBPSA-Italy for the years 2015-2017 has recently been elected. Vincenzo Corrado (Polytechnic of Torino) has been confirmed as President. The other members of the board are: Francesco Asdrubali (University of Perugia), Paolo Baggio (University of Trento), Francesca Cappelletti (University Institute of Architecture of Venezia), Enrico Fabrizio (University of Torino), Andrea Gasparella (Free University of Bolzano), Luigi Marletta (University of Catania), Livio Mazzarella (Polytechnic of Milano) and Adolfo Palombo (University of Napoli).

Cooperation between IBPSA-Italy and AIA

A new agreement of cooperation has been signed between the AIA (Acoustic Italian Association) and IBPSA-Italy to organise joint working groups, seminars and conferences.

2nd edition of the course on Building Dynamic Energy Simulation

In accordance with the cooperation agreement, the second edition of the building performance simulation course organized by AiCARR Education and IBPSA-Italy is taking place in Milan from 11 March to 24 April with a total of 48 hours of lectures, in Italian. It includes a general introduction on the fundamentals with a focus and practical exercises on EnergyPlus and TRNSYS. Most lecturers are IBPSA-Italy members and the program was approved by the IBPSA-Italy board. The course will be repeated in other Italian cities and it will offer 48 Italian Continuing Education Credits to attending engineers, as this course has been accredited by the National Council of Engineers.

BSA 2015

On 4-6 February 2015 the Free University of Bolzano again hosted the Building Simulation Applications Conference. This second IBPSA-Italy conference succeeded in attracting even more authors and contributions and extending IBPSA-Italy's international presence.

While maintaining the compact one-and-a-half-day format of the first conference, three parallel sessions were needed instead of two to allow oral presentation of the 70 papers, more than one third (38) of which came from non-Italian research centres and institutions. The main topics were lighting, user behavior and comfort, high performance buildings and retrofit, energy systems, tools, envelope performance modelling and solar radiation modelling. Three of the sessions were entirely devoted to the presentation of papers by PhD students, competing for the first PhD IBPSA-Italy Award.

Four special keynotes opened or closed each day's activities, making a valuable contribution to fostering discussion and providing inspiration for the participants. Professor Ian Beausoleil-Morrison (Carleton University), President of IBPSA, gave a speech on *The past, present, and future of BPS and IBPSA's role*, a topic further analysed by Professor Jan Hensen (TU Eindhoven) in his talk *Challenges and opportunities for building performance simulation*. Professor Ardeshir Mahdavi (TU Wien) gave a keynote talk on *Common fallacies in representation of occupants in building performance simulation*, while Professor Athanasios Tzempelikos provided the delegates with a detailed overview of current developments in research at his institution, Purdue University, speaking on *Balancing daylighting, comfort and energy requirements in perimeter building zones – dynamic facades*.

At the conference closing session, the keynote speakers also presented awards to PhD Students Daniele Antonucci for the paper *Estimation of the water flow rate and heating consumption in an office building of*

a central heating system using system identification, Luca Battistella for *Urban heat island in Padua, Italy: simulation and mitigation strategies*, Jay Dhariwal for *Building simulation based optimization through design of experiments* and Sandra Stefanovic for *Modelling of domestic fine particles indoor exposure, its main sources and potential mitigation scenario: the case of Beijing*, and to the winners of the first IBPSA-Italy Award for a Building Simulation-Aided Project, Dr Eng Norbert Klammersteiner for *Design of the Air Conditioning System of the Tropical Greenhouse of MUSE, the natural history museum of Trento* and Dr Eng Fabio Viero for *Design of the New Headquarters of Prysmian in Milan*.

The Proceedings and recordings of the presentations will be available soon after the final editing phase. For further details and updates on the conference, please visit the conference website www.unibz.it/en/sciencetechnology/welcome/IBPSA.html.

The third BSA conference will take place in two years' time, again in Bolzano. ■

IBPSA-Japan

IBPSA-Japan hosted ASim2014, the 2nd Asia Conference of the International Building Performance Simulation Association, together with IBPSA-China and IBPSA-Korea, on 28 and 29 November 2014 at Nagoya University. There were 136 delegates, and 111 papers were presented — 86% of them written by authors from Asian countries. Students' contributions were remarkable in ASim2014 as 47% of papers were mainly written by students. We celebrated three best student paper award winners: Juyeon Chung (Kyushu University), Min-Hwi Kim (Hanyang University) and Yao Nie (Tsinghua University). Masato Miyata (National Institute of Land and Infrastructure Management) and Young-Jin Kim (Sunmoon University) jointly received the best paper award.



During the closing session of ASim2014, Prof Kwang-Woo Kim announced that IBPSA-Korea will host the next ASim conference. ■

IBPSA-Korea

Kwang-Woo Kim, President, IBPSA-Korea

IBPSA-Korea hosted two special sessions on building simulation at the Korean Institute of Architectural Sustainable Environment and Building Systems (KIAEBS) biannual national conference held on 29 Nov 2014. A total of 72 papers were presented at the conference, of which 12 were in IBPSA-Korea's special sessions. With growing interest in building simulation these sessions were a great success, with papers on a variety of topics including energy simulation using BIM, cross-comparison of data-driven models, ISO 13790 vs. EnergyPlus for performance assessment of glazing systems, use of BIM for ISO 13790 calculation, building energy simulation at the early design stage, photovoltaic simulation for residential buildings, risk analysis for energy retrofit project, and performance simulation of water source heat pumps.. ■



A speech at the KIAEBS/IBPSA-Korea fall conference on 29 Nov 2014

IBPSA-Nordic

On 18 November 2014 IBPSA-Nordic and Equa Simulation Finland Oy organized a seminar in Innopoli II, Espoo, Finland on the topic of lighting energy in building design. The programme included presentations on *Daylight utilization, energy efficient lighting design and examples of lighting calculations in life-cycle analysis of buildings*, by Anne Jokiranta and Kimmo Liljeström from Optiplan Oy, and on *Daylight calculation and control using the IDA-ICE software and IDA-ICE connection with the Radiance program*, by Mika Vuolle from Equa Simulation Finland Oy. ■

IBPSA-Netherlands+Flanders (NVL)

Prof Jan Hensen (TU Eindhoven), President of IBPSA-NVL, presented the first IBPSA-NVL Best Thesis Award 2014 to Ir Arnout Aertgeerts at KU Leuven on 8 December 2014.

The IBPSA-NVL Best Thesis Award is made annually to reward the author of the thesis that best contributes to the extension of knowledge in the area of building simulation, or application of building simulation, and takes the form of a cheque for €500. The aim is to highlight the importance of accurate knowledge of the application of building performance simulation.

Arnout Aertgeerts won the award for his thesis *Demand side management of thermal flexibility in a residential neighborhood using a hierarchical market-based multi-agent system*, submitted towards the degree of Master of engineering - energy at the KU Leuven, under the supervision of Prof Lieve Helsen and Prof Dirk Saelens.



In a bright and clearly written thesis, Arnout delivers an excellent contribution to research on intelligent energy supply in cities. The assessors praised his highly challenging and forward-looking research and impressively broad multi-disciplinary approach. Arnaut developed a simulation model which uses a market-driven multi-agent system for thermal energy storage tanks and thermal mass in houses (TES). The controlled charge and discharge can make an important contribution to the organization of a stable supply-demand profile of our electrical infrastructure. With his research, Arnaut made a very valuable contribution to the implementation of such a market-driven multi-agent system and contributed to the development of a link between Modelica and Python, two environments that offer new opportunities and challenges for building performance simulation. ■

IBPSA-Switzerland

Achim Geissler

IBPSA-CH held a Python Workshop in October 2014, a Members' Workshop in January 2015 and has two further events planned for 2015.

The October 2014 workshop, *Python for Building Simulation* run by Clayton Miller of ETH Zürich, was well-attended considering the very specialized topic and small Swiss community. Clayton gave hands-on introductions to various options, especially for post-processing vast amounts of simulation data — a very handy skill.



Computers Galore at the Python Workshop on 31 October 2014 in Zürich

The January 2015 workshop, for IBPSA-CH members only, aimed to better define where IBPSA-CH should be heading as an organisation. It was hosted by AFC (Air Flow Consulting), Zürich. Attendance was very good, with 37 members present. Discussion showed that members felt strongly that IBPSA-CH should increase its focus on being a link between researchers and practitioners. To this end, the IBPSA-CH website will undergo major changes shortly. Membership application will no longer be “fill out and click – you’re in” but will change to a peer review type of admission. This will make it possible to make more meaningful and “internal” information available for members. We hope that the three current workgroups and the communities will then be able to share and exchange information more easily. Also, new “member tags” for individual skills/ areas



Great turnout of Members at the January Workshop on IBPSA-CH's future direction

of work will be added in order to aid members in finding specialists for certain topics. This should also help to connect researchers and practitioners. We hope all this works out OK!

Sadly, we had to say goodbye to our Board Member Christian Struck at the workshop, as he has left Switzerland; we thank him for his dedication and work!

IBPSA-CH has planned a "Feierabendseminar" (after work seminar) on the topic of building automation and simulation with two input presentations from commercial companies. We expect lively discussions to ensue. Later in the year, in September, IBPSA-CH will have an embedded session on building simulation at CISBAT '15. ■

IBPSA-USA

IBPSA-USA is in a period of rapid change and development. This article summarizes just some of these activities. Please check the www.ibpsa.us website now and in the coming months.

New Executive Director and staff to support IBPSA-USA activities.

About 4 years ago, IBPSA-USA hired its first staff support, an administrative assistant working 1 day per week.

Then, just over a year ago in November 2013, IBPSA-USA hired a new $\frac{1}{2}$ time Executive Director — Mike Wilson — with an objective of transitioning from an all-volunteer organization to one with more stable and professional operation. Mike has helped improve operations, and has successfully spearheaded a number of new activities, including increasing funding support for IBPSA-USA activities. Mike is located in the San Francisco Bay area, and is reachable at mike@ibpsa.us.

Then, several months ago in November 2014, IBPSA-USA also hired a new $\frac{1}{2}$ time assistant to Mike. These new resources are greatly increasing our capacity to generate information and resources intended to benefit the building energy modeling community. We are able to accomplish so much more!

This new level of activity has also brought new annual budget levels. A challenge is to accomplish more without giving up key values, such as a strong IBPSA-USA commitment to generating open source products. To monitor resources, Mike works with IBPSA-USA's Executive Committee to monitor a detailed 2-year cash flow projection of income and expenditures. Results have been very positive.

New Website

In 2014 IBPSA-USA developed a new website, based on Drupal. The intent was to distribute to several people the ability to input to and edit portions of the website. The new site is up and running at www.ibpsa.us. Some key resources on the site include:

- **Unmet Hours**, a new Question-and-Answer Resource for the Building Energy Modeling Community. This is located on a separate site linked from the ibpsa.us site. You are welcome to try it out.
- **Publications**, a resource location for publications. The contents are currently being expanded.

We are now testing a new capability to provide access to subsets of the site to chairs of committees and to officers of regional and local chapters. We anticipate this will allow us to publish more in-depth information in a more timely way.

Local and Regional Chapters

There are now 10 active local and regional chapters, and IBPSA-USA has a strong commitment to provide support and services to the chapters. Erik Kolderup and Chris Balbach have co-chaired a national committee to provide support to the chapters. One such support is a GoToWebinar subscription that can be used by all chapters, on a jointly scheduled basis. The local and regional chapters are a very active part of IBPSA-USA! See the chapters page of the website at www.ibpsa.us/chapters.

Conferences

There are several key conferences:

- We collaborated with ASHRAE on a very successful 2014 ASHRAE/IBPSA-USA Building Simulation Conference that merged the IBPSA-USA SimBuild and ASHRAE Energy Modeling Conference.
- We are now beginning to plan for and discuss collaboration for Simbuild 2016.
- IBPSA-USA is hosting the international Building Simulation 2017 Conference to be held in San Francisco. This is a major commitment for IBPSA-USA. Phil Haves is chairing this effort, a conference committee is in place, a hotel has been selected (the Hyatt Regency), and a conference manager has been hired.

Collaboration with USGBC on GreenBuild.

IBPSA-USA has very recently signed a sector partnership agreement with USGBC (US Green Building Council) to collaborate on the next GreenBuild conference. Board member Chris Balbach is heading this effort and will join the Greenbuild 2015 Program Working Group. A Greenbuild Program Working Group Retreat will take place April 16, 2015 in Washington, DC. During the retreat, the Working Group will review the top rated sessions from the 1st and 2nd rounds of review of potential Greenbuild sessions, and select the most qualified sessions for the final 2015 Greenbuild program.

Training Seminars in Building Energy Modeling (BEM)

IBPSA-USA has developed a one-day BEM Seminar with HVAC focus, with support from ASHRAE and Rocky Mountain Institute (RMI). This course has been given over 25 times and counting. IBPSA-USA and ASHRAE have an agreement to co-host the seminars, and proceeds have more than recovered IBPSA-USA's investment in developing the seminar. An update to the course content is being planned.

A side benefit of the BEM seminar with HVAC focus is that it has proved successful to present a series of workshops while the entire open source contents of the seminar are posted on the IBPSA-USA website for free download.

More recently we have developed a detailed outline for a similar seminar on modeling aspects of daylighting and lighting. The board has approved going ahead with development, pending obtaining modest co-funding.

Board & Executive Committee Meetings and Focus

In recent years, the Board had held web meetings every 2 weeks for an hour. In an effort to focus more on policy issues, since October 2014, the full Board now meets 1 time per month for 1.5 hours. In addition, the Executive Committee (President, VP, Secretary, Treasurer, and Executive Director) meets twice a month and focuses on administrative matters.

Membership Dues

Several years ago the annual dues for full members went to \$90 and membership dropped substantially. Then several months ago a decision was made to cut dues in half in an effort to increase membership. Analysis showed that the impact on annual income would be marginal, and would indeed be positive if membership increased substantially. Membership in recent months has increased by 50%, and we have not yet done a push to increase membership.

Committees as Primary Focus for IBPSA-USA Volunteer Activities

We are now actively focusing on committees as a major focus for accomplishing our objectives.

In the past the Board and Board members formed the main source of volunteers. But this was a small pool of volunteers and caused “burn out.” We are now actively shifting the focus of volunteering to an expanded committee structure (with Board liaison, of course). This focus has been underway informally for about a year, and has been increasing in the past few months. See the committees page of the website at www.ibpsa.us/committees.

Next Steps

There are more activities underway and planned. Please check with our website for updates. ■

University news and job opportunities

This new section of ibpsaNEWS reports new jobs, courses, notable lectures, and theses on topics of particular interest to IBPSA members. If you know of any other learning and teaching news that you believe would interest the IBPSA community please send an email to C.J.Hopfe@lboro.ac.uk.

A Finnish project on local energy matching

Advanced Local Energy Matching in Future Smart Hybrid Networks Using Semi-virtual Building Emulation

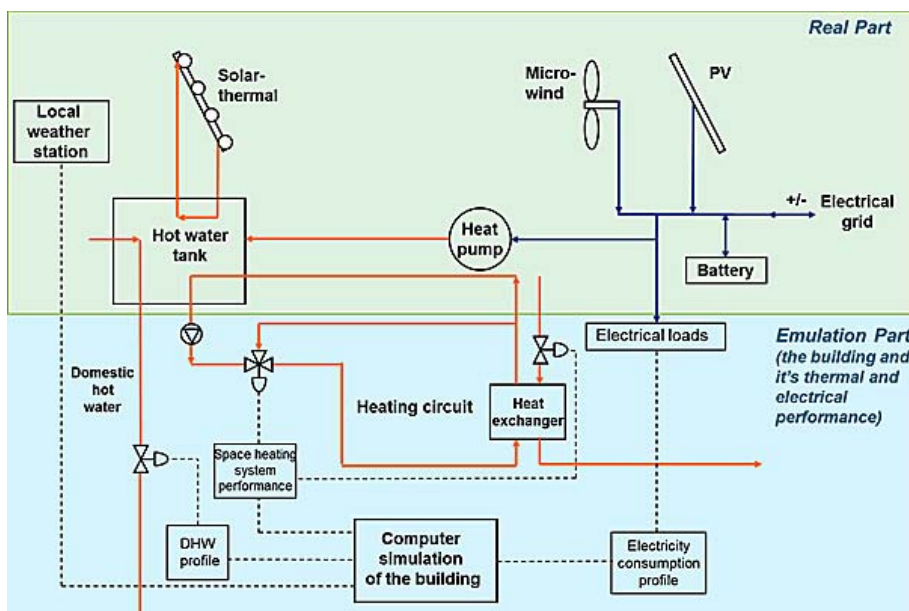
Mismatch between on-site generated energy and energy demand of buildings, and its impacts on different energy networks, is an inevitable problem in Net-Zero Energy Buildings (NZEB). This 4-year project, which started on 1 September 2014, will make a comprehensive study of the problem using a building emulator test-rig. The project partners are VTT Technical Research Centre of Finland and Aalto University, and the project is funded by the Academy of Finland.

The main objective of the project is to design NZEBs with the best possible energy matching capabilities when connected to bi-directional hybrid smart electrical and thermal grid networks. For this purpose, an emulator test-rig has been built, consisting of a real part (including on-site renewable energy generation from solar, wind and ground, connected to hybrid bi-directional electrical and thermal networks with local electrical and thermal energy conversion and storage options) and a virtual interactive building modelled in the computer.

The virtual building comprises a heating circuit and domestic hot water (DHW) and electrical loads (see Figure). TRNSYS^[1] is used to carry out real-time simulation of the building and find its performance at each time-step. The simulation communicates with the test-rig via LabVIEW^[2], which controls the heating circuit operation so that the water operating temperatures and flow rate match the simulated values.

The DHW and electrical load profiles are based on high resolution data from monitored sites. The matching characteristics of the building are

being evaluated using new indices (on-site energy fraction and on-site energy matching indices) based on a general topology of energy flow including heating and cooling as well as electrical energy^[3]. The project also includes the building, testing and operation of an energy management system (EMS), which can also provide predictive control over subsequent time-steps. The EMS decides how to optimize the energy flow in the emulator



Basic components of the emulator project

and interact with different energy networks based on one or more simultaneous set targets (minimizing the primary energy consumption, minimizing the emissions, maximizing the economic profit, etc.).

The outputs of the project will include improved versions of the indices used in the energy matching analysis, including heating and cooling energy as well as electrical energy, from both the building's and the grid's perspectives. The comparison between the building's operation as measured at the study sites and that modelled in the emulator will identify characteristics of energy demands and on-site energy generation in low/zero energy buildings. In addition, it will quantify the benefits that can be obtained using advanced building emulation. An energy management system such as that developed in this project is greatly needed in the implementation and progress of interactive NZEB.

For further information, contact Dr. Ala Hasan, VTT Technical Research Centre of Finland, ala.hasan@vtt.fi .

References

^[1] TRNSYS, The University of Wisconsin Madison <http://sel.me.wisc.edu/trnsys/features/features.html>

^[2] LabVIEW System Design Software, National Instruments Corporation <http://ni.com/labview>

^[3] Sunliang Cao, Ala Hasan, and Kai Sirén, "On-site energy matching indices for buildings with energy conversion, storage and hybrid grid connections," *Energy and Buildings*, Vol. 64, pp. 423-438, 2013. ■

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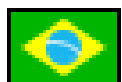
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IBPSA's mailing list has been consolidated into another listserver known as BLDG-SIM, which is a mailing list for users of building energy simulation programs worldwide, including weather data and other software support resources. To **subscribe** to BLDG-SIM, to unsubscribe or to change your subscriber details, use the online forms at <http://lists.onebuilding.org/listinfo.cgi/bldg-sim-onebuilding.org>.

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