



25-26 April 2019

University of Sheffield

# TECHNICAL SYMPOSIUM 2019

## Transforming Built Environments

*Driving change with engineering*

### Programme

 @CIBSE #CIBSEsymposium



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# Day One Programme

Thursday 25th April 2019



Case study



Briefing paper



Opinion piece

## 08:45 Registration and refreshments

## 09:30 Welcome – Room A

Welcome: Prof Stephen Beck, University of Sheffield  
Opening address: Stephen Lisk, CIBSE President

## 09:45 Opening session – Room A

### Session 1

Chair – Stephen Lisk – CIBSE President



#### 1.1 Stuart Shell – BranchPattern

Engineering the occupant experience

## 10:15 Parallel sessions

### Session 2 – Room A – 10:15

#### The future of performance assessment

Chair – Abigail Hathway – University of Sheffield

#### 2.1 Christina Birch – University of Manchester

The development of a methodology for assessing unregulated power consumption on a university campus - pilot study



#### 2.2 Nishesh Jain – University College London

Moving beyond energy, integrating it with indoor environment quality: UK school building case study



#### 2.3 Ant Wilson – AECOM

Understanding the numbers behind the NABERS energy rating system

#### 2.4 Robert Cohen – Verco

Design for performance: development of a national UK scheme

### Session 3 – Room B – 10:15

#### Delivering and assessing performance in building lighting

Chair – Tony Sung – Consultant



#### 3.1 Steve Shackleton – Fagerhult Lighting

Workplace Lighting: The potential for LEDs to help improve lighting quality in offices

#### 3.2 Eleonora Brembilla – Loughborough University

Improving solar data in CIBSE climate files – Survey of measuring networks and test on daylight simulation

#### 3.3 Seda Kaçel – Istanbul Technical University

Integration of adaptive behaviour into the post-occupancy evaluation of the luminous environment for a holistic evaluation

3.4 Siti Norzaini Zainal Abidin – First City University College  
Daylight under tropics: process, performance and post occupancy factors in commercial case studies

### Session 4 – Room C – 10:15

#### Assessing and improving heat networks

Chair – Ewan Jones – AECOM

#### 4.1 Jon Greaves – Hydro-X Water Treatment Limited

Water quality assessment in UK district heating systems

#### 4.2 Sam Paine – University of Southampton

Impacts of fixed-rate charges on heating and controls use in communal network social housing

#### 4.3 Rachel Bell and Duncan Josh – Atkins

An analysis into the feasibility of a combined thermal network to supply district heating and cooling to a waterpark



#### 4.4 Phil Jones – Building Energy Solutions

5th generation heat networks - a major step forward for decarbonising heat in the UK

### Session 5 – Room A – 12:00

Chair – Mike Smith – BSRIA

## 12:00 Special address 1 – Room A

## 12:10 Compendiary presentations 1 – Room A

### Session 6 – Room A – 12:10

Chair – Mike Smith – BSRIA

#### 6.1 Heloisa Fonseca – Public Health England

Radon and newly built properties – information from builders to buyers

#### 6.2 Mohataz Hossain – University of Nottingham

Improving workspace environment through changing design strategies in clothing factories

#### 6.3 Jake Piner – University of Portsmouth

Improving the operation of the ground source heat pump at Chichester Festival Theatre

#### 6.4 Steven Peet – Frese Ltd

Achieving design delta-T for overall system efficiency and plant room performance



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**6.5 Kate Paxton – Hodkinson Consultancy**

Simulated vs measured summertime thermal comfort performance of new build dwellings

**6.6 Zaki Iqbal – Loughborough University and American University of Ras Al Khaimah**

Use of innovative building materials to transform the built environment in the United Arab Emirates

**6.7 Steve Munn – Hevasure Ltd**

Development of a low-cost optical corrosion sensor for use in commercial heating and chilled water systems

**9.2 Edward Murphy – Ollio The Building Performance Consultancy**

Indoor air quality and the health and wellbeing agenda – A desktop review of the current state of IAQ science and instrumenting technologies

**9.3 Peter Walsh – WSP UK Limited**

Intrusion of street sourced nitrogen dioxide into a building lobby

**9.4 Curtis Gubb – University of Birmingham**

Plants as a building service: Improving indoor air quality and reducing energy consumption – a critical review

**12:40 Lunch and posters****13:30 Parallel sessions****Session 7 – Room A – 13:30****Water utilisation and treatment for building success**

Chair – Jonathan Gaunt – SoPHE – Cundall

**7.1 Achala Wickramasinghe – CIBSE**

A new method of estimating design flow rates for water supply systems in residential buildings

**7.2 Stanislava Boskovic – Imperial College London**

Blue green infrastructure empowers urban patterns

**7.3 Phil Henry – Polypipe**

Evaporation from Blue Green roofs

**Session 8 – Room B – 13:30****Making existing buildings perform – Facilities management group**

Chair – Geoff Prudence – CIBSE FM Group – Consultant

**8.1 Rachel Dick – CIBSE FM Group**

Smart sensors as a method to improve the performance of buildings and barriers to their uptake

**8.2 Ravi Kumar Shukla – Arcadis UK Limited**

Water conservation and gravity drainage system – zero wastewater discharge policy

**8.3 Antony Corbett – Geberit**

The case for retrofit sprinkler installations in UK domestic building stock

**Session 9 – Room C – 13:30****The realities of building IAQ**

Chair – David Fitzpatrick – CIBSE Patrons – Colt International

**9.1 Samantha Carlsson – Hoare Lea LLP**

Exemplar approach to indoor air quality for a new office fit-out

**15:05 Refreshments and posters****15:25 Parallel sessions****Session 10 – Room A – 15:25****Innovative green energy sources**

Chair – Julie Godefroy – CIBSE Technical Manager

**10.1 Henrique Lagoeiro – London South Bank University**  
Heat from underground energy London

**10.2 Gareth Davies – London South Bank University**  
Electrical cable tunnel cooling combined with heat recovery in cities

**10.3 Livio de Santoli – Sapienza University of Rome**  
Hybridization of a desiccant cooling system for solar cooling application using a trans-critical CO<sub>2</sub> heat pump and PV panels

**Session 11 – Room B – 15:25****Information tools and techniques for construction and operation**

Vanessa Friedberg – ASHRAE YEA – Siemens

**11.1 Fan Wang – Heriot-Watt University**  
Smart environmental modelling for energy efficiency and indoor quality of special-purpose buildings

**11.2 Colin Pearson – BSRIA**  
Building performance compliance checking with a virtual construction management programme

**11.3 Sara Ibrahim – Al Amar Consulting Group**  
Obstacles facing BIM implementation



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**Session 12 – Room C – 15:25**

*The future of building power*

Chair – Eleonora Brembilla – Loughborough University



**12.1 Andreas Georgakarakos – University of Sheffield**  
Transforming buildings into energy vectors using battery storage

**12.2 Geetha Sathi – Arcadis UK Limited**

Control of STATCOM with supercapacitors as energy storage system for improved power quality



**12.3 Tony Sung – Consultant**  
Technical update on BS7671 - 18th Edition IET Wiring Regulations

**16:45 Debate**

**Session 13 – Room A – 16:45**

*Debate – Designers do not focus on the needs of occupier*

Chair – Sara Kassam – CIBSE Head of Sustainability Development

**19:00 Informal buffet reception**

*Walking distance from the Diamond building*

**21:00 Day one close**

## CIBSE Technical Symposium 2019 Posters

All speakers who presented in sessions 6 and 21 will also be displaying posters. They will be available to discuss their posters during the lunch and refreshment breaks.

## CIBSE Technical Symposium 2019 Speaker Profiles

View CIBSE Technical Symposium 2019 speaker profiles:

[www.cibse.org/speakerprofiles](http://www.cibse.org/speakerprofiles)

Available from April 22nd

## Friday Morning Tour (pre-session)

### Sheffield Urban Flows Observatory

On Friday 26 April, between 8am and 9am, before the main Symposium presentations commence, come and see Sheffield University's Urban Flow Observatory.

The urban flows observatory is gathering data across the city including thermal and visual imagery, air quality information and energy use through mobile and static sensors. The data will be made open access through a website to be launched in Summer 2019.

In this session, you can come and look at the mobile sensing vans, preview the website and the data that is available and talk to some of the researchers about the related projects. We will also be showcasing other Sheffield research projects, such as work developing the visualisation of building management system data, as outlined in session 14.2 on also Day 2, Friday 26 April.

The mobile sensing vans will be located outside the Diamond building and the other demonstrations will be in the Mind Sphere Lounge, adjacent to the café on the ground floor.

During the time, you will be able to wander between demos but to help manage capacities and your experience, please sign up to a time slot for each location at this link: <https://goo.gl/HXvTsA>

**Sheffield Urban Flows Observatory:**  
<https://urbanflows.ac.uk/>



# Day Two Programme

## Friday 26th April 2019



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### 08:45 Registration and refreshments

### 09:00 Parallel sessions

#### Session 14 – Room A – 09:00

##### Smarter building operation

Chair – Tony Day – CIBSE HVAC Group – International Energy Research Centre

##### 14.1 Kat Kelly – Atlas Controls

Putting some sense into smart homes: proving the case for automated domestic heating and ventilation

##### 14.2 James Milton – University of Sheffield

Visually displaying past and present smart building data through virtual reality



14.3 Dan Cash – University of the West of England  
When is a building smart?

#### Session 15 – Room B – 09:00

##### Modelling the engineered environment

Chair – Tim Dwyer – Symposium Chair



15.1 David Hamlyn – RWDI  
Modelling the impacts of building emissions on their local surroundings

##### 15.2 Geoffrey Levermore – University of Manchester

Reshaping the understanding of building dynamics with time constants

##### 15.3 Rebecca Ward – Cambridge University

A structured stochastic model for specification of occupant-related end-use energy demands in building energy simulation

#### Session 16 – Room C – 09:00

##### Addressing the challenge of overheating homes

Chair – Anastasia Mylona – CIBSE Head of Research



16.1 Laurence Cockman and Abi Roberts – Colt International Ltd

Overheating in residential developments: a comparative study highlighting how evaporative cooling can address this inefficiency



16.2 Katherine Holden – Sweco  
Limiting residential overheating in a noisy environment

##### 16.3 Mich Swainson – BRE

Achieving a better understanding of air infiltration when assessing overheating in multi-residential dwellings

### 10:20 Refreshments and posters

### 10:40 Parallel sessions

#### Session 17 – Room A – 10:40

##### Ensuring effective natural ventilation – Natural ventilation group

Chair – Martin Liddament – CIBSE Natural Ventilation Group – Consultant

##### 17.1 Ben Hughes – University of Nottingham

Novel integration of passive ventilation windcatcher and rotary heat recovery device



17.2 Zhiwen (Vincent) Luo – University of Reading

Impact of air pollution on natural ventilation potential in different climates of China



17.3 Ze Nunes – Mach Acoustics

Facade design for high performance, acoustically sensitive, natural ventilation



17.4 Benjamin Jones – University of Nottingham

Introducing the 2019 edition of CIBSE Applications Manual AM10: Natural ventilation in non-domestic buildings

#### Session 18 – Room B – 10:40

##### Developing sustainable buildings and systems

Chair – George Adams – CIBSE Past President & CIBSE Resilient Cities Group – SPIE UK

##### 18.1 Melvin Mathew – Loughborough University

Should current indoor environment and air quality standards be doing more to protect young people in educational buildings?

##### 18.2 Carlos Ochoa – IERC

Refurbishment methodology to attain thermally comfortable near-zero energy buildings using customizable solutions

##### 18.3 Clara Bagenal George – Elementa Consulting

Understanding the importance of Whole Life Carbon in the selection of heat-generation equipment

##### 18.4 Rajat Gupta – Oxford Brookes University

Defining the link between indoor environment and workplace productivity in naturally and mechanically ventilated office environments



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**Session 19 – Room C – 10:40****Reducing building environmental impact**

Chair – Munis Hameed – CIBSE YEN – Ramboll

**19.1 Puteri Shireen Jahn Kassim – International Islamic University Malaysia**

Reinventing the passive design framework in the tropics: The experience of green rating systems and passive strategies

**19.2 Roy Sigalingging – University of Liverpool**

Assessing internal conditions in typical housing built to Passivhaus Standard in Jakarta, Indonesia – analysis for a hot, humid, tropical season

**19.3 Robin Curtis – GeoScience Ltd**

Getting serious on carbon reduction – How a UK university campus could steer its way to &gt; 80% cuts by 2050

**19.4 George Bennett – UCL**

Secret life of boilers

**Session 20 – Room A – 12:20**

Chair – Charlotte Mercer – Cundall

**12:20 Special address 2 – Room A****12:30 Compendiary presentations 2 – Room A****Session 21 – Room A – 12:30**

Chair – Charlotte Mercer – Cundall

**21.1 David Glossop – Elementa Consulting**

DHW: Evidence-based design

**21.2 Andrew Butterworth – EECO<sub>2</sub>**

Energy efficiency in cleanrooms

**21.3 Suzana Zekic – Imtech Engineering Services London and Luis Gomes-Agustina – London South Bank University**

Towards the determination of acoustic characteristics of ventilation plastic ducts

**21.4 Usama Asif – Raahim Associates**

An analysis of HT/LT distributed and concentrated power supply in skyscrapers

**21.5 Karl Cullen – chapmanbdsp**

More than the sum of parts – a Part L case study of Battersea Power Station

**12:55 Lunch and posters****13:45 Parallel sessions****Session 22 – Room A – 13:45****Improving design practices**

Chair – Ashley Bateson – CIBSE Vice President – Hoare Lea

**22.1 Andy Lewry – BRE Global**

The 'Mind the Gap' project: Investigating the difference, in performance, between design and the building 'in-use'

**22.2 Andrew Corney – Trimble**

Applying lessons from software design to building services engineering

**22.3 Craig Wootton – University of Sheffield**

Evolving practice to enable and constrain technological impact

**Session 23 – Room B – 13:45****Effective commissioning and operation**

Chair – Andrew Saville – CIBSE YEN Mentor – Consultant

**23.1 Tsung-Hsien Wang – University of Sheffield**

Fault detection and localization using IFC: A case study of BIM-based visualisation of BAS-related faults

**23.2 Darragh Gleeson – Integrated Environmental Solutions**

Digital engineering, data analytics and model calibration – the future of building operation?

**23.3 David Green – CDML**

Building commissioning – Event or process?

**15:00 Concluding technical session – Room A****Session 24 – Room A – 15:00****Concluding technical session**

Chair – Kevin Kelly – CIBSE Vice President

**24.1 Chris Twinn – Consultant**

Heat Autonomy – Life after district heating

**24.2 Susie Diamond – Inking**

How do we recognise quality and professionalism in building simulation?

**15:45 Awards and closing reception****Session 25 – Room A – 15:45**

Chair – Hywel Davies – CIBSE Technical Director

**16:45 Day two close**



# YOUR EXPERIENCE COUNTS



## Years of experience but no formal qualifications?

Whether you're starting out, have been working in the field for years or are already professionally registered with another engineering institution, our range of membership grades and routes to membership mean that there are options to suit everyone.



It is easy to forget a lifetime of personal achievement. Experience is invaluable and should never be underestimated.

Martin Trentham MCIBSE IEng, Interserve Engineering Services.



Having gained a BEng degree, I needed to demonstrate technical ability to Masters Level to gain CEng registration. There were two options open to me, either return to university full or part-time to complete a Masters or undertake a Technical Report. I decided to pursue the Technical Report Route.

James Outram, MCIBSE CEng, Hoare Lea.

## Interested in joining CIBSE?

We can help you find out which membership grade or registration level is right for you and can talk you through your eligibility for the alternative routes to membership for those who do not have accredited qualifications or who have no formal qualifications. Get in touch by emailing [membership@cibse.org](mailto:membership@cibse.org) or call +44 (0) 208 772 3650

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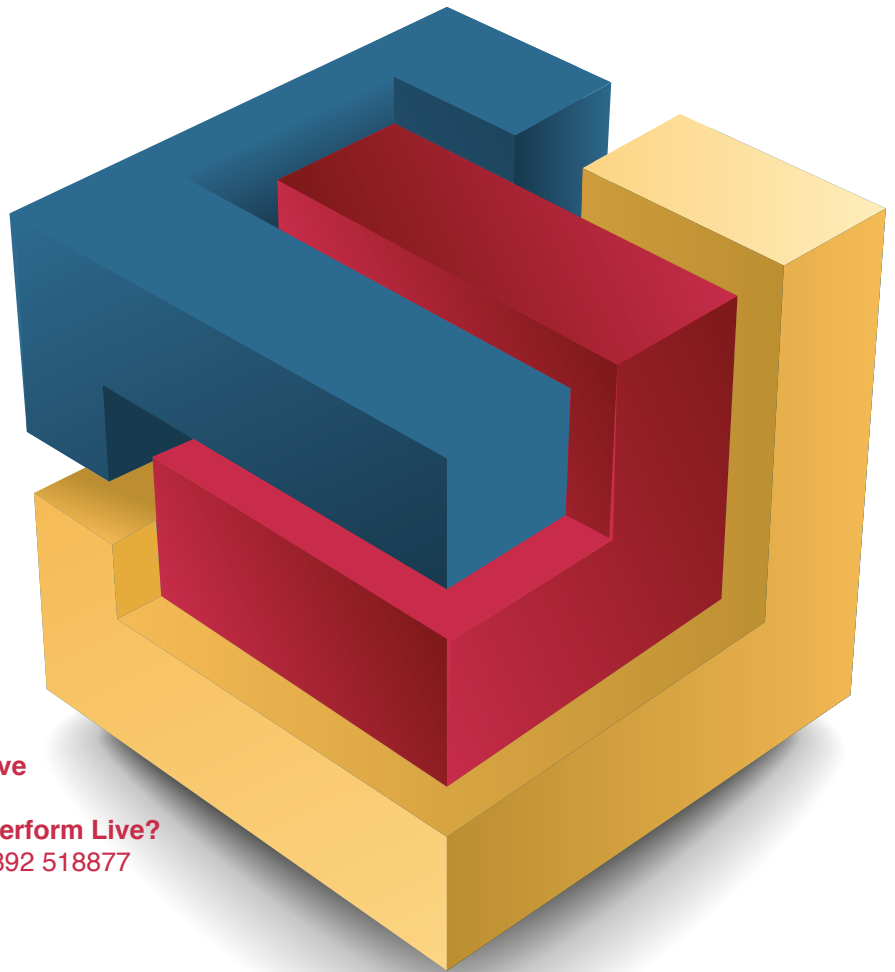
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