



### 3rd Task 56 Experts meeting at Dublin Institute of Technology

The 3rd Task 56 Experts meeting was hosted by Dublin Institute of Technology (DIT, Ireland) from March 2-3, 2017 in connection with the 1st International Conference on Building Integrated Renewable Energy Systems. Experts from 14 research institutions and five industry partners participated in the meeting. Two representatives from New Energy Technology Department at Kawasaki city in Japan joined Task 56 meeting for the first time. During the Experts meeting, a general introduction of Task 56 was given by the Operating Agent Roberto Fedrizzi. Together with the experts, the Subtask leaders identified the progress of the work in the three Subtasks. Selected presentations from the meeting are summarised in this newsletter.

The industry workshop on "Building Envelope Technologies and Lessons Learned" was arranged on day two of the Task meeting. Invited experts from Kingspan, FenestraPro, O'Donnell + Tuomey, Solarwall and Aventa presented their experiences on this topic.

Ten countries were represented at the Task meeting: Austria (3), Canada (2), Denmark (1), Germany (3), Italy (3), Japan (2), Norway (2), The Netherlands (1), Spain (1) and Ireland (6) as host and observer.

Contributions from partners at the Task meeting:



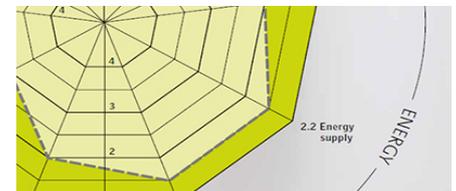
#### The Passive House Planning Package

by Passive House Institute is an easy to use planning tool for energy efficiency for the use of architects and planning experts. Several thousand users have experienced the reliability of the calculation results of this planning tool ... [\[more\]](#)



#### Energy- and cost-efficient, façade-integrated daylight and led illumination

- shall be improved by employing micro-structured optical components for daylighting and electrical lighting. There are two compatible micro-optical structures under development by Fraunhofer IBP and partners that can be combined with one another ... [\[more\]](#)



#### Buildings that give more than they take

The Active House vision presented by Cenergia defines highly ambitious long-term goals for the future building stock: Create healthier and more comfortable lives for their occupants without impacting negatively on the climate ... [\[more\]](#)



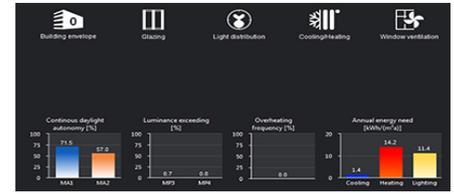
### BI solar systems at Columbia University

The Center for Zero Energy Building Studies (CZEBS) of Concordia University has been a leader in several research networks and has a significant academic contribution in the past years ... [\[more\]](#)



### Building Integrated Solar Heating by SolarWall®

SolarWall® is a solar heating technology that is integrated into the building's south façade and is being used around the world in 40 countries ... [\[more\]](#)



### DALEC – Day- and Artificial Light with Energy Calculation

The newly developed Online-Analysis-Tool DALEC developed by Bartenbach & partners allows to analyse the effects of early-stage façade concepts in an intuitively accessible way ... [\[more\]](#)

## Task 56 Industry Workshop

March 23, 2017  
Dublin Institute of Technology  
Ireland

The Task 56 Industry workshop on March 3, 2017 at Dublin Institute of Technology (DIT) aimed to get an update on building envelope technologies and lessons learned from invited partners (see left box). Operating Agent Roberto Fedrizzi (EURAC) opened the workshop by giving an overview of the objectives and activities in Task 56.



### Workshop invited partners and building envelope solutions

As an introduction to the workshop Prof. David Kennedy from Dublin Institute of Technology presented the project **Building integrated Solar Thermal Systems (BISTS)**. BISTS is an *European Cooperation in Science and Technology (COST) Action* and supported by the *EU Framework Programme Horizon 2020*. A consortium of 22 partners presents a critical mass of European knowledge, expertise, resources, skills and R&D in the area of STS, supporting innovation and conceptual thinking. BISTS defines a solar thermal system to be integrated into a building if the building integrity or functionality depends on it. To fully explore the Pan-European nature of STS three generic European regions are considered in BISTS: Southern Mediterranean, Central Continental and Northern Maritime Europe. Among other feedback, Prof. Kennedy pointed out that construction laws around Europe are too variegate and standards needed to architects are not adequate.

Invited partners:



BISTS is on-going from 2013-2017.  
Further reading:  
<http://www.tu1205-bists.eu/>  
[http://www.cost.eu/COST\\_Actions/tud/TU1205](http://www.cost.eu/COST_Actions/tud/TU1205)

**Kingspan's** strategy is being an one-stop-shop integrated solution for the building. The design of the BI solution is developed by Kingspan's internal departments. In the next step the interaction with architect, energy consultant and owner is important. Kingspan is world leading in building systems and solutions, including envelope systems and integrated renewable systems.  
[www.kingspan.com](http://www.kingspan.com)

Contact:

[Barry Sharry](#), Kingspan  
[Prof. David Kennedy](#), DIT  
[David Palmer](#), FenestraPro  
[Denise Murray](#), O'Donnell + Tuomey

**FenestraPro** developed an easy facade performance software for architects and façade manufacturers taking into account the performance of the building in the early design phase. FenestraPro operates within the Revit® software for BIM (Building Information Modelling), is easy to operate and fast to promote the interactions, which are needed by the building designer in the early stage.  
[www.fenestrapro.com](http://www.fenestrapro.com)

Award-winning architectural practice **O'Donnell + Tuomey Ltd** shared experiences with the participants of the Industry workshop on façade-integrated technologies illustrated on the examples of Grangegorman library in Dublin and Central European

John Hollick, SolarWall

Michaela Meir, Aventa AS

University CEU in Budapest. Critical in adopting new façade-integrated technologies is having the client on board. Long life cycle of facade-integrated component is a concern since it is not easy to remove and substitute. Economics are an issue, in particular in projects without lighthouse character.

[odonnell-tuomey.ie](mailto:odonnell-tuomey.ie)

**SolarWall®** is a solar heating technology that is integrated into the building's south façade. As space heating accounts for over 50% of buildings' energy needs in northern climates the technology is being used in 40 countries worldwide. It heats air directly for maximum efficiency and it can either blend into the façade or become an architectural feature. Applications are for residential, industry, agriculture and tertiary sectors. Possible future development: SolarWall integrated with air-based heat pumps.

[solarwall.com/](http://solarwall.com/)

**The AventaSolar Technology** introduces high-performance polymer materials as a key to realize flexible dimensions for building integrated solar heating modules and obtain costs reduction by substitution of conventional facade covers and large production volumes. The cooperation with building industry is essential at an early project stage regarding building regulations, installation practices and logistics. As main barriers the lack of competence among installers and other involved actors, economic competitiveness, complex system design and installation process.

[www.aventasolar.com](http://www.aventasolar.com)

## Workshop Summary

### What can help bringing a product into the market?

The importance of regulations requiring to meet onsite renewable energy generation- and performance targets has been pointed out by several experts; further to educate about benefits of renewables and trade-offs for different technologies. Planner and architects lack often accreditation systems for the components to be installed and flexibility to choose between a range of materials. Obviously durability, easy installation and the possibility of changing surface materials and building appearance has to be in focus. According to suppliers uniform regulations are needed over Europe.

### How much do renewables depend on subsidies?

The dependency of implementing renewable energy technologies is presently strongly linked to subsidy schemes. Problematic is the roller coast effect when the incentives change drastically and without interim solution for stepping down. Experts also agreed that unstable subsidy schemes are counteracting in the sector creating purchasing waves in the market.

### The Passive House Planning Package (PHPP)

Passive House buildings and energy efficient projects which are carefully planned using the PHPP have proven successful. Whether new builds or retrofits, building projects that achieve the Passive House Standards meet the level of comfort and the extremely low energy demand being strived for. The PHPP is continually being validated and extended on the basis of measured values and new research findings.

In the context of accompanying scientific research in several objects, measured results were compared with the calculated results. In the process, a high correlation could be demonstrated between the demand calculated using the PHPP and the consumption ascertained through scientific monitoring projects.



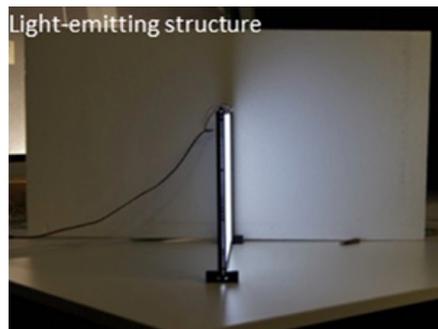
Usefull links:

## An ideal instrument for realising NZEBs

The possibility of planning and assessing efficient projects in a reliable way makes the PHPP an ideal planning tool for the implementation of NZEBs (Nearly Zero-Energy Buildings) or other buildings which are also optimised for low energy consumption. Proven successful over many years, PHPP is also useful for the calculation of NZEB's which are now being strived for in Europe and worldwide. This is the case in spite of the different national expressions this definition may take, with reference to the detailed characteristics of the projects.

*Tomas Mikeska, PHI-Passive House Institute, Germany; [tomas.mikeska@passiv.de](mailto:tomas.mikeska@passiv.de)*

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## Energy- and cost-efficient, façade-integrated daylight and led illumination based on micro-optical components

Energy efficiency, life cycle balances and indoor comfort shall be improved by employing micro-structured optical components for daylighting and electrical lighting. There are two compatible micro-optical structures under development that can be combined with one another, namely

- Light-redirecting structures, which are applied to both sides of transparent substrate layers and are being optimized for redirecting glare-free daylight deeply into the building interior;
- Light-emitting structures at the surface of transparent substrates, which emit laterally injected LED light specifically on one side only. The element remains transparent when viewed from above (plan view).

The optical structures will be integrated into the building envelope in different ways:

- When integrated into vertical facades, these structures allow the sunlight directly incident from a wide range of solar altitudes to be redirected into spaces located deep inside the building interior, namely without sun tracking.
- When integrated into rooflights, they allow for improved lighting of low-lying areas in high, narrow spaces (e.g. atria or light wells).
- As the artificial-light emitting structure is integrated in windows and rooflights, future building envelopes will also be able to supply artificial lighting, besides providing virtually unlimited natural lighting. In some cases, conventional indoor lighting systems may hence be waived.

*This joint project is funded by the Federal Ministry for Economic Affairs and Energy (BMWi) (Project Management Jülich). Project partners are Fraunhofer Institute for Building Physics (IBP), Green Building R&D GmbH, Karl Jungbecker GmbH, durlum GmbH, RIF e.V. Institute for Research and Transfer TU Dortmund, Saint-Gobain Sekurit Deutschland GmbH & Co. KG, Temicon GmbH, Schürmann Spannel AG (SSP) and ai3 / Dr.-Ing. Werner Jäger.*

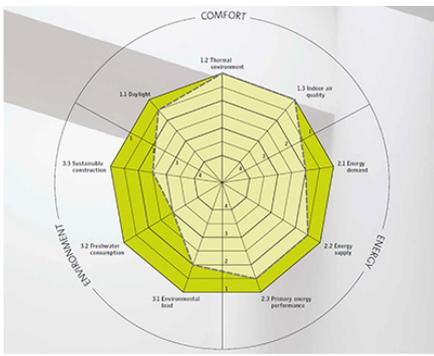
*Carolin Hubschneider, IBP, Stuttgart, Germany [carolin.hubschneider@ibp.fraunhofer.de](mailto:carolin.hubschneider@ibp.fraunhofer.de)*

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## Active House Specifications

### - Buildings that give more than they take

Active House is a vision of buildings that create healthier and more comfortable lives for their occupants without impacting negatively on the climate – moving us towards a cleaner, healthier and safer world. The Active House vision defines highly ambitious long-term goals for the future building stock. The purpose of the vision is to unite interested parties based on a balanced and holistic approach to building design and performance, and to facilitate cooperation on such activities as building projects, product development, research initiatives and performance targets that can move us further towards the vision. The Active House principles



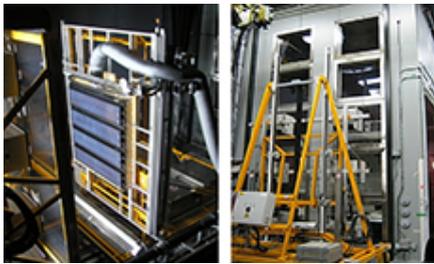
[www.activehouse.info](http://www.activehouse.info)

propose a target framework for how to design and renovate buildings that contribute positively to human health and well-being by focusing on the indoor and outdoor environment and the use of renewable energy. An Active House is evaluated on the basis of the interaction between energy consumption, indoor climate conditions and impact on the environment.

In the Task 56 we are using the Active House Specification Radar in the following projects; Lykkebo School, Grøndalsvænget School, Living in Light Box and Gl. Jernbanevej. In the two first projects (Lykkebo and Grøndalsvænget School) we are evaluating the effect that the ventilation projects have had on the comfort (CO<sub>2</sub> and temperature). In the Living in Light Box (a small office building) and Gl. Jernbanevej (multi-storeyed dwelling) we are making a total evaluating where all three categories of the Active House Radar is included; comfort, energy and environment.

*Vickie Aagesen, Cenergia part of KUBEN Management, [vjaa@kubenman.dk](mailto:vjaa@kubenman.dk)*

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Please visit: [CZEBS](http://CZEBS)

### Building-Integrated Solar Systems: Overview of Recent and Current Work at Concordia University

The Center for Zero Energy Building Studies (CZEBS) of Concordia University has been a leader in several research Networks and has a significant academic contribution in the past years. Part of this research is held at the unique Solar Simulator and Environmental Chamber of Concordia University. Also Concordia University contributed at the design and the realization of projects towards the Net-zero energy goal such as the EcoTerra house, the BIPV/T system at the John Molson School of Business, the Varennes Library and other. Currently, air-based BIPV/T systems for integration in spandrels or in curtainwall are investigated. In addition, new technologies such as semi-transparent Photovoltaics and Double Skin Facades integrating Photovoltaic panels are tested and characterized at the facilities of Concordia University. Also Concordia University is participating at the Solar Decathlon China 2017 competition representing Canada and is part of several other Net-Zero energy building projects.

*Zissis Ioannidis, CZEBS, Concordia University, Montreal, Canada; [zissis.ioannidis@gmail.com](mailto:zissis.ioannidis@gmail.com)*

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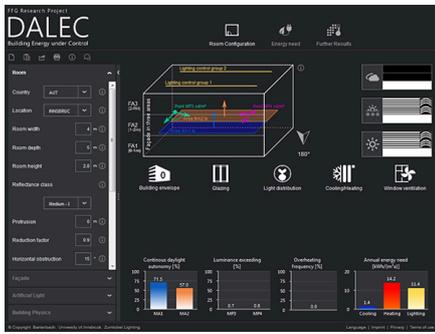


### Building Integrated Solar Heating by SolarWall

Space heating accounts for over 50% of buildings' energy needs in northern climates and large surfaces free of snow are necessary to meet this demand. SolarWall® is a solar heating technology that is integrated into the south façade and is being used around the world in 40 countries. It heats air directly for maximum efficiency and it can either blend into the façade or become an architectural feature. Numerous photos of many building types were presented to show the versatility and attractive appearance of building integrated solar air collectors.

*John Hollick, Solarwall, Canada; [jhollick@solarwall.com](mailto:jhollick@solarwall.com)*

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Please visit: [www.dalec.net](http://www.dalec.net)

## DALEC – Day- and Artificial Light with Energy Calculation

- A development by Zumtobel, University of Innsbruck and Bartenbach GmbH

Building design significantly affects the energy demand of the building. Especially the façade system determines the solar gain, and as a result the demand for heating, cooling and artificial light. A realistic evaluation of the building behavior so far can only be done by a coupled light and thermal simulation – a costly and time-consuming task to undertake by building experts. The newly developed Online-Analysis-Tool DALEC allows architects, building engineers, light planner and building owner to analyse the effects of their early- stage façade concepts in an intuitively accessible way. All relevant complex physical processes are considered with high accuracy while the input efforts and calculation time is minimized. In this way for instance different façade systems can be compared regarding their impact on annual daylighting, artificial lighting demand, heating and cooling demand and user comfort by a well-structured graphical illustration. A future edition will enlarge the functionality to further visual and thermal comfort criteria, will enable evaluation of complex buildings and will further simplify direct design comparisons.

*Andreas Ampenberger, Bartenbach GmbH, Austria; [andreas.ampenberger@bartenbach.com](mailto:andreas.ampenberger@bartenbach.com)*

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### Which experts participate in Task 56?

The experts, which contribute to Task 56 are introduced on our public IEA SHC website. Find a short partner description and the aimed contribution to Task 56 [here](#). For updates, contact [Subtask leader A](#) or the Operating Agent. Status: July 2017.

### What are the on-going projects?

Read [more](#) about the projects with public funding, which support the work in Task 56. Status: Mai 2017.

### Next Experts meeting 21. - 22. September 2017

The next Task 56 experts meeting will take place at Eindhoven University of Technology, The Netherlands. For updates on the experts meeting, please check back [here](#).

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### Task 56 Newsletter

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