

Index and Programme

Wednesday, 9 October 2019

Plenary Session

Ernst Ulrich von Weizsäcker

Environmental scientist and honorary president of the Club of Rome Co-Chair, International Resource Panel

“Come on”

Hou Li’an

Environmental specialist academician, Chinese Academy of Engineering

Indoor air quality control for a healthy China

Diana Ürge-Vorsatz

Environmental scientist and engineer. Professor, Department of Environmental Sciences and Policy, Central European University

IPCC report 2018/2019 – A summary

Wolfgang Feist

Founder of the Passive House Institute and Professor at the University of Innsbruck

Passive House – building healthy, comfortable and sustainable constructions globally

Session 1:

Room 3

China: Non-Residential Passive House projects

1:30 PM Wang, Yafeng; Yang, Ming

Share of case of first Premium Passive House in China

This paper briefly describes the calculation process of PHPP and how to achieve the first Premium grade Passive House in China by optimizing doors and windows, thermal insulation, thermal bridges, fresh air system, heat pumps and renewable energy resources. The paper also elaborates the differences between PHI standard and the calculation methods for glass parameters and the test methods for fresh air system in China.

1:55 PM Michulec, Dawid

Passive House experience from South China

Through regular consultations and joint visits of the execution with the Passive House building certifier Ing. Dawid Michulec, a very good quality of execution could be guaranteed for both projects. Monitoring systems were installed in both projects to optimally regulate energy consumption and comfort.

2:20 PM Shuhui, Tian

R&D Centre Hebei Academy of Building Research

The Hebei Academy of Building Research Centre is the first completed large-scale non residential project in the field of Sino-German cooperation of low-energy passive house. The building is the first of the dena Sino-German Energy Efficient non-residential buildings in China, completed end of 2014.

2:45 PM Zhang, Peng; Yun, Qinghua

Research on key technologies for passive ultralow energy consumption in China's Central Plains region

This paper mainly studies the key technologies for passive ultra-low energy consumption in central China. The paper analyzes the process of airtightness detection, and reaches a conclusion that the energy-saving rate of the vertical louver shading compared with no shading is up to 1.52%, and exhibits the best effectiveness at the angle of inclination of 0°.

3:10 PM Deng, Binta

From 0 to 1

This paper focuses on the development of Passive House in China, starting from nothing, and then to a comprehensive promotion. Projects throughout China's 22 provinces and cities are supported by the relevant government departments in order to encourage the development of passive house.

Session 2:
Airtightness and Quality Assurance

Room 4

- 1:30 PM Peper, Søren; Schnieders, Jürgen**
Guidelines for airtightness measurements in highrise buildings
In high-rise buildings, the stack effect can cause pressure differences of more than 50 Pa between the ground and top floors. For valid airtightness measurements, it is particularly important to avoid measurement points where underpressure and overpressure are present simultaneously in the building.
- 1:55 PM Cai, Qian**
The selection of materials and measures for the airtightness of Passive Houses with different construction types
This paper sorts out and analyses the airtight materials used in the market at present, proposes the applicability of different airtight materials, and summarizes the corresponding key nodes of the air tightness and treatment measures in combination with the structural characteristics of different buildings.
- 2:20 PM Meyer-Olbersleben, Michael**
Measuring the air tightness in highrise buildings
In last decade we have been 22 times in China to do measurements and workshops during the construction of the first Passive Houses in China. We have seen, that it is possible to obtain very good results. These good results are necessary for the function of these buildings. But we have also seen, that we need to upskill all people who are involved in the value chain of construction.
- 2:45 PM Bai, Yu**
Construction control and energy consumption functioning in renovation project of Passive ultra-low energy green buildings - with Landsea Huabei Passive House experience center as an example
This paper focuses on the existing buildings, how to realize the renovation of passive low-energy buildings. From the aspect of construction and functioning, the paper will introduce and analyze the different building parts' construction and analyze energy consumption functioning through the actual use of the building.
- 3:10 PM Peng, Mengyue**
Practice and thoughts on whole-process quality control of ultra-low energy passive buildings in China
This paper introduces the development status of the passive ultra-low energy buildings in China. It explains how good planning and high quality construction of passive low energy buildings in China can be ensured and proposes recommendations for the large-scale and high quality development of passive low energy buildings in China.

Session 3:
Ventilation concepts

Room 5

- 1:30 PM **Iannone, Ileana**
Innovative strategy for retrofitting high rise social housing building stock at a territorial scale: the case study of Torri Madonna Bianca – Trento (Italy)
This paper will discuss the solutions and challenges involved in retrofitting 3 towers located in the modernist social housing district of Madonna Bianca in Trento, Italy. Results will show a radical reduction in terms of energy consumption and a significant improvement of living comfort.
- 1:55 PM **Kaufmann, Berthold; Jiang, Huijun**
Ventilation+AC design layout for apartments in (Chinese) cooling climates
Highly-efficient heat exchanger and fans are indispensable for highly efficient ventilation unit. Other aspects must be paid attention to as well: good airtightness, well-insulated casing, hygiene through filter, balanced airflow, proper condensate water drain, good accessibility of components and unit for maintenance to exclude performance gap.
- 2:20 PM **Wei, Xing**
Research on air distribution of all-in-one HVAC systems based on Airpak simulation
One of the necessary conditions for passive houses is the environment all-in-one HVAC system with the heat recovery function. This paper simulates the airflow distribution of the environment all-in-one HVAC system by means of Airpak 3.0.16 software.
- 2:45 PM **Fanxuan, Xia**
Collaborative design and research of fresh air ventilation system and exhaust system for kitchen and bathroom in Passive House
This paper focuses on the influence of heat and energy ventilation units on humidity and cleanliness management of exhaust air ducts in the Longfor Railway City Passive House project. It shows that energy recovery has a better performance than heat recovery, which can reduce the hygiene risks.
- 3:10 PM **Ochs, Fabian; Siegele, Dietmar; Calabrese, Toni; Dermentzis, Georgios**
Ventilation, heating and domestic hot water preparation with decentral compact heat pumps
For multi-family buildings a complete renovation including conversion to central heating systems is often not possible. Very compact heat pumps are developed that can be integrated into the window parapet or into a prefabricated timber façade. The wall integration has a high potential in prefabrication and leads to an optimal solution for small apartments.

Session 4:
Ecology

Room 6

1:30 PM **Aichholzer, Martin**

Use of sustainable building materials on the example of the "House of Learning"

When the "House of Learning" was designed an attempt was made to keep the ecological footprint as small as possible, whereby the client's socio-cultural and economic aspects play an equally role. There were many small measures and unconventional approaches necessary to pursue these goals.

1:55 PM **Fallon, Ann-Marie; Pearce, Hugh**

Delivery of the first 'high rise' Passivhaus development in the UK, lessons learned, and carbon impact study

Agar Grove block is the largest scale Passivhaus development in the UK. It drove innovative ways of dealing with a masonry construction typical of the UK at scale. A growing awareness of embodied carbon led to research on the next phase comparing the construction and tender material carbon impacts.

2:20 PM **Quinn, Jason**

PHPP and LCAQuick - an integrated energy / Life Cycle Assessment toolset

Demonstration of the integration between the Microsoft Excel based LCAQuick and PHPP which allows simultaneous calculation of the Life Cycle Assessment (LCA). This allows the designer to optimize the building to minimize energy and multiple environmental indicators simultaneously.

2:45 PM **Grove-Smith, Jessica**

Climate-specific renewable primary energy factors across China

This paper describes the PER (primary energy renewable) approach based on selected examples from different climate zones in China. It explains how and why PER weighting factors vary for different locations and highlights the implications for combining energy efficiency and renewable energy supply.

3:10 PM **Schulze Darup, Burkhard; Krick, Benjamin**

Sustainable supply systems in multi-storey residential buildings

The paradigm shift from fossil fuel based building services technology to a renewable energy supply makes possible new decentral techniques with a very favourable life cycle assessment. In the next few years the opportunity must be seized to bring sustainable technology onto the market on an industrial scale.

Session 5:

Room 8

WORKSHOP: designPH 2

1:30 PM **Sifferlen, Camille**

designPH 2.0 - What new shading algorithms can do for you!

This paper will explain the differences between the new shading concept of the plugin designPH 2.0 and the current concept of PHPP. It will also explore the potential of these new algorithms via a case study in different climate zones and to finish with, present some future development ideas.

2:20 PM **Arnautu, Dragos**

designPH 2.0 explained - how to apply the new shading

In the new designPH shading detection, single or multiple measuring points and different detection solutions can be chosen from, dependent on window area and the shading objects and distance. The paper will explain how to apply the new shading analysis according to different shading situations, so reliable shading factors can be generated for design or certification purposes.

3:10 PM **May, Edwin**

Using Sketchup as an information modeler for enhancing accuracy and simplifying certification

Digital workers involved in the creation and management of large datasets need to develop the skills for creating custom tools to help improve accuracy and streamline their work. This session will present a particular case where a simple extension was created in order to help manage building room-level data in a 'Sketchup' 3D model.

Session 6:
Projects in Heating Climates

Room 3

4:00 PM **Flechas, Oscar**

The Valleyview Town Hall: Energy Efficiency in the Canadian Subarctic

The Valleyview Town Hall sets an example of a fiscally and environmentally responsible approach to new municipal buildings in northern Canada. This case study describes the challenges overcome by the municipality and design team to meet the Passive House standard in the Canadian subarctic.

4:25 PM **Lebinger, Thomas**

Passive Houses for active students - providing knowledge about eco-efficient buildings

It is the aim of the OeAD-Housing Office to convey knowledge about eco-friendly building to future generations and to offer the highest possible standard of living with the lowest environmental impact. This paper highlights two OeAD-Guesthouses in Vienna and Leoben.

4:50 PM **Failla, Maria Chiara**

The impact of thermal bridges in reinforced-concrete multi-family house and high-rise projects

An evaluation of the heat losses caused by typical thermal bridges in a reinforced-concrete building and their impact on the energy balance was conducted for a 5-storey and a 15-storey building. The analysed thermal bridges can be reduced through flanking insulation, punctual penetrations or thermal breaks.

5:15 PM **Reinberg, Georg W.**

Realizing the ecological civilisation

Using typical examples, this presentation shows that through the passive house concept and energy generation, the goals of an "ecological civilisation" can be successfully achieved today. Subsequent monitoring proved the workability of energy producing and ecological passive houses.

- 5:40 PM **Dietz, Søren**
Passive House School in the northern part of Denmark: 7 years' consumption below PHPP calculated values
- 5:45 PM **Verhulst, Graeme**
Passive House goes to work: A commercial office case study
The Charter Telecom building, the first Passive House office in Western Canada and first engineered mass timber building in our region, is presented as a case study in applying the Passive House standard to non-residential buildings in the context of North-Western North America.
- 5:55 PM **Whitmore, Dan; Boetzel, Alex**
Verified successful airtightness approaches in the US and the PNW
Selection of a specific air-barrier system alone, does not guarantee the whole building air-tightness will be Passive House level. Strict quality control is still required during the course of construction. Testing prior to concealing air-barrier components, are vital to ensure successful execution.

Session 7:
China: Implementing Passive House

Room 4

4:00 PM **Lingchen, Kong**

Key points of Passive House design and construction control from developer's perspective - Take Gaobeidian Railway-City project as an example

In Gaobeidian Train New Town Project, Longfor Group has summarized a set of control points for the Passive House design through continuous exploration, hoping to provide some guidance for the Owner's management of Passive House projects in the future.

4:25 PM **Shaobiao, Zhao**

Technology and application analysis of prefabricated ultra-low-energy buildings in cold areas

The heat transfer coefficient of prefabricated sandwich insulation wall board can meet the requirement of less than $0.15 \text{ W}/(\text{m}^2 \cdot \text{K})$ when the anchor made of GFRP material are placed in the middle with insulation of 200~300 mm.

4:50 PM **Lu, Mingzhe**

German passive house technology "Chinese re-innovation"

With the development of China's construction industry and the popularization of new national codes, more and more Passive Houses will be built in different climatic zones in China. As more and more experienced professionals continue to work in the field of Passive Houses, there will be more new directions and better localized technical solutions for the re-innovation of Passive Houses in China.

5:15 PM **Yu, Mou**

Let Passive House construction become "Non-passive"

This paper demonstrates the influences of design on economy of the Passive House projects with the project cases, explains the misunderstanding to the Passive Houses and it's design, and calls on everyone to regard the Passive Houses rationally.

- 5:40 PM **Shuo, Li; Liu, Lei**
Research on Passive House thermal bridge free design - taking the Passive House residential extension and demonstration community project in Sino-German Ecopark as an example
- 5:45 PM **Wei, Lin-Bin; Li, Qi**
Discussion on design of passive ultra-low energy building based on performance measurements

The passive ultra-low energy building can improve the building energy-saving performance in China. However, the relevant standards of design and construction are distempered. Based on the technical standards at home and abroad, the practice and performance test of passive ultra-low-energy buildings in Shandong Province will be discussed.
- 5:50 PM **Zhang, Funan; Wei, Hedong**
Analysis of thermal bridges of door and window openings in the walls of Passive ultra-low energy Buildings
- 5:55 PM **Tao, Wen; Ke, Yang**
Analysis for outdoor air system heat recovery of commercial Passive House
- 6:00 PM **Chuai, Yu**
PHI certified steel precast construction systems
In three years R&D period, the current precast building envelop system has been optimized by Dena, thermal bridges in all important details have been calculated by PHI. The Sd value has been tested and the hygrothermal simulation has been made by Fraunhofer Institute. Such a precast building system as a result has been certificated by PHI in 2019.

Session 8:
Construction Systems

Room 5

- 4:00 PM Freundorfer, Franz**
Passive House Building envelope in all climatic regions – solutions for the practice
The Passive House should be marketed as one single product. Convincing decision makers at the very beginning of any planning process of the cost-efficiency of the Passive House standard results in success. The Passive House should also be produced as one single product, as it is more than the sum of its components.
- 4:25 PM Rongen, Ludwig**
Prefabricated Passive Houses in modular construction
The prototype of a highly energy-efficient house with passive house components, developed in prefabricated modular construction for the warm and humid climate of Quanzhou's summer is to be produced in industrial mass production using robotic technology.
- 4:50 PM López-García, Soraya; Lowes, Edward**
Uptake of native Certified Passive House Components by the Chinese passive construction sector - a gap analysis
Recent years have seen widespread adoption of Passive House in China, both for buildings and construction products. This paper examines which locally manufactured construction systems, windows and HVAC units are being used in Chinese developments, with a view to spotting trends and opportunities.
- 5:15 PM Xiaodong, Xia; Zitong, Wang; Zebin, Chai; Yu, Shi**
Prefabricated light steel and light slurry walls without thermal bridge
This paper introduces the structure and process of fabrication and installation of prefabricated, thermal bridge-free light steel and light slurry walls, and explains how such series walls are widely applicable to enclosure structures of various low-rise and multi-story prefabricated Passive House buildings.
- 5:40 PM Strang, Marcus**
Material benefits and risks of cross laminated timber for Passive House construction in tropical climates
Climate-appropriate design changes for Passive House that employs Cross Laminated Timber in Australian hot-humid climate using a well-received case study. Achieved through assessment of design solutions and hygrothermal analysis to inform an optimised CLT envelope assembly.

Session 9:

Room 6

Sinfonia - Deep retrofits international

4:00 PM Arnautu, Dragos

Lessons from an EnerPHit industrial building in Sri Lanka

This paper will tell the success story of an outdated factory in Katunayake, Sri Lanka, that has been retrofitted and turned into an EnerPHit certified garment manufacturing facility by a remotely collaborating team of Jordan Parnass Digital Architecture, Steven Winter Associates and the Passive House Institute.

4:25 PM Tumbas, Milica; Chen, Lovell

Old Quad - significant heritage building retrofitting to Passive House EnerPHit standard

The Old Quad project is the first where the EnerPHit standard has been applied to a significant heritage building in Australia. The application of EnerPHit standards in this heritage building delivers a balance between the heritage values and achieving thermal comfort and economic efficiency.

4:50 PM Ingui, Michael

Combining a systematic approach with final design benefits to passive retrofits

Engine 16 is an adaptive reuse of a historic firehouse converted into multifamily residences with a public community facility. It's one of 7 Passive Houses Baxt Ingui has under construction. We're excited to share the details, decisions, and the systematic approach used on this unique project.

5:15 PM Sun, Hui; Zhao, Xing

Building airtightness and Chinese craft – the Ao'ni Courtyard project in Songyang, China, as an example of how traditional timber construction can achieve EnerPHit

This EnerPHit project shows how to realize the building air tightness, and to substantially improve its thermal performance, prolong the service life of main structures, and tackle the challenge for comfort and energy conservation, protection and reuse of buildings in traditional timber structure.

5:40 PM **Varga, Szabolcs**

Case study of a pre-certified step-by-step retrofit to EnerPHit standard of a 1950`s building located in a cold climate zone

The step-by-step retrofit to the EnerPHit standard using component method, of a typical solid brick house built in Romania in the 1950s was presented. After completing the EnerPHit retrofit plan the total heating energy demand of the existing building is reduced by 85%.

5:45 PM **Hrynyszyn, Bozena Dorota; Tian, Zhiyong**

Retrofitting according to the EnerPHit standard in cold climate - components

The object of retrofitting is one of the smaller typical Norwegian wooden houses from the 60s. Optimal packages of measures, including mechanical components, were determined using the Passive House Planning Package according to the EnerPHit criteria for energy retrofit with the energy demand method.

5:50 PM **Dietz, Søren**

Final renovated social housing to PH standard with district heating, CO₂ emissions of future energy systems

Prim/End factor in Building code DK2015 and DK2020 are unrealistic. Renovation to NZB as Toftebo Case and fossil free district heat by 2035 and 2050 can fulfil low emission demand. Prim/End 2035 and 2050 are calculated to 0,88 and 0,97. Prim/End wind elec. drops from 2,5 to 1,13 in 2050.

Session 10:
WORKSHOP: Kitchens

Room 8

4:00 PM **Xiao, Peng; Liu, Lei**

Fume exhaust and air-makeup and exhaust system in kitchens of Passive Buildings

This paper, with Qingdao Sino-German Ecopark as a case, carries out research on the differences between the fume exhaust and air-makeup and exhaust systems in kitchens of Chinese and German Passive Houses, and optimizes the scheme for the fume exhaust and air-makeup and exhaust system in the kitchen of Passive buildings proposed by PHI from the perspective of use of Chinese kitchens.

4:25 PM **Guo, Haifeng; Liu, Yulin**

HVAC Design Difficulties and Ventilation System Solutions for Chinese Kitchens in Passive Houses

This paper studies the characteristics of Chinese style kitchen and HVAC design schemes. In combination with the technical points, the paper analyses the technical difficulties in HVAC design and ventilation system in the kitchen of the Passive House, and proposes four schemes.

4:50 PM **Zhao, Yang**

Discussion of Selfbalance Oil Fume Purifier in Passive Room Kitchen

Self-balance Oil Fume Purifier (SOFP) will not pump out the indoor air to outdoors when removing fume thoroughly. As a result, SOFP technology can fulfill the requirements of low energy consumption in passive house.

5:15 PM **Schirmer, Stefan**

Ventilation system in Chinese Passive House: Challenges with integration of WC and kitchen in heat recovery

This paper identifies various challenges in the Chinese market and shows that they can only very slowly be improved by know-how transfer, steadily improved quality of products and control of design, energy calculation and construction quality.

5:40 PM **Bräunlich, Kristin; Kah, Oliver**

Extractor hoods in kitchens in energy-efficient buildings

Extractor hoods have the task of reducing air pollution caused by cooking. The paper presents the results of a research project on cooker hoods in living kitchens and derives recommendations for passive houses.

Thursday, 10 October 2019

Plenary Session

Wolfgang Feist

Founder of the Passive House Institute and Professor at the University of Innsbruck

Latest developments of Passive House technology and components worldwide

Cheng Caishi

Chief Economist, Mohurd (Hebei government)

Successes and Experiences with ultra low energy buildings in Hebei Province

Xu Wei

Board Chairman of CPBA (China Passive Building Alliance)

Perspectives on the development of nearly zero energy building in China

Zhang Xiaoling

Kangju Institut – Building Certification and Consulting, Beijing

Challenges and development trends for Passive Houses in China

Gu Xiuming

Acting representative CEO, Longfor Group

Passive House in Practice: The construction experience of Longfor Group – The Bahnstadt Project

Martin Meesenburg

President of EBH and Meesenburg Group

The Development of energy efficient buildings in Europe

Ni Haiqiong

CEO, Orient Sundar Group

Promoting a new era of high quality Passive House Developments

Session 11:
Sinfonia - Districts

Room 4

11:30 AM **Higgins, Christopher; Wickham, Andrea**

City Process for ensuring projects target and achieve Passive House certification

Vancouver has made great progress to 2 million square feet of Passive House in permitting or under construction. This presentation gives an overview of processes Vancouver has gone through to encourage Passive House projects. We will show other cities how they can lead with Passive House focused policy.

11:55 AM **Bermich, Ralf**

Passive House city district Heidelberg-Bahnstadt - experience and evaluation

The City of Heidelberg is committed to ambitious climate protection and sustainable development. The new city district Bahnstadt is developed on the area of the former freight yard. With an area of 1.16 square kilometer Bahnstadt is the first quarter of this dimension entirely built in passive house standard.

12:20 PM **Reyes Bernal, Elena; Flórez, Javier**

Implementation of the Passive House standard in social housing in Mexico, lessons learned

The LAIF Component of the Ecocasa Program ran until 2018 in Mexico, with the aim of reducing CO₂ emissions in social houses by 80% through the cost-efficient implementation of the Passive House standard. This paper includes the main outcomes and the lessons learned during implementation.

12:45 PM **Fei, Han**

Large-scale certified Passive House development in Qingdao, China -- demonstrative residential project settles in Sino-German Ecopark

Passive houses reduce greatly the dependence on fossil fuel energy while providing high indoor comfort. The innovative large-scale development of passive house residences in the Ecopark Qingdao can abolish the district heating and reduce infrastructure investment, in this way the passive house residences will save a lot of energy and emit less CO₂ and dust pollution, contributing to the environment quality.

1:10 PM **Lang, Günter**

Reduction of the heating demand of buildings by 50% until 2050

It's possible to reduce the energy demand to 50% of the whole building sector until 2050, if actions are taken consequent and immediate, like a field analysis of two city areas shows. Therefore, the focus must be put on the best available building standards, both for new buildings and for refurbishments.

Session 12:
Training and design concepts

Room 5

11:30 AM Winkel, Susanne

Quality assurance through further training

For the past 12 years the PHI, together with more than 100 partner organisations, has been providing training and further education in the field of highly energy-efficient construction around the world. Since 2018, this program has been modularized and gradually expanded to cover the entire planning and construction process of highly energy efficient buildings.

11:55 AM Si, Daxiong; Liu, Yabo

The significance of Passive House education in Chinese colleges and universities

This paper analyses the characteristics of the Passive House course and the way of talent cultivation of Hefei University, and provides a case for the development of Passive House in Chinese universities. In the future, the mode of cultivation of the passive house technicians in which course, experiment and project practice are combined will be attempted

12:20 PM Bonilauri, Enrico

Re-Learning training: The need and potential for regional and trades-specific training

Emu Systems' curriculum covers CPHT learning objectives in North American conditions, from Florida to Alaska. Responding to participants' requests, Emu also added a workshop: at its core are the Emu Passive Pods, micro Passive Houses including exercises designed around the CPHT learning objectives.

12:45 PM Frey, Wolfgang

Thermal Comfort in summer vs. large windows

The global spread of the Passive House and climate change make summer comfort increasingly important. With thoughtful design, multifunctional facades and structural shading, planners can develop intelligent, economical and energy-efficient buildings. This paper shows examples from Germany and China.

1:10 PM Zhang, Huifang

A systematic approach towards designing thermal bridge-free constructions

This paper introduces definition and influences of thermal bridges, and explains the importance of anti-thermal bridge design in the Passive House projects. The paper also shares the methods and ideas for handling thermal bridges from design of nodes, calculation of thermal bridges and cost economy to construction communication in combination with the domestic project experience and examples.

Session 13:

Room 6

Non-residential buildings

11:30 AM Kaufmann, Berthold

Office and residential Passive House building in Zhuozhou, China – focus on monitoring

As of today, not many Passive House buildings in China have been monitored so far. But the information from measurements are essential to know what the buildings behavior is in reality and if the users are happy with this new building conception and living experience there. This article outlines the data and the experience gained from ZhuoZhou office building.

11:55 AM Frisque, Andrea; Wimmers, Guido

The Wood Innovation Research Laboratory at UNBC, Prince George, BC, Canada

The Wood Innovation Research Lab, certified Passive House in 2018, is a small university laboratory with an industrial workshop with large equipment for developing wood products, a small office component, and one seminar room. It achieved exceptional airtightness with a final test result of 0.07 ac/h.

12:20 PM Sanchez, Marine

Strategies for improving energy efficiencies in large institutional kitchens

The University of Victoria's PH student residences is among the few projects aiming to reach the standard with a fully-equipped commercial kitchen. The design adopts a wide range of measures, detailed and assessed in PHPP, to reduce the high-energy intensity embedded in the kitchen operation.

12:45 PM Peel, Andrew

Shifting Gears: A Passive House car dealership in the making

This paper explores the challenges and solutions of the world's first Passive House Car Dealership. Strict requirements, a tough climate, and operational realities forced the design team to continually re-evaluate proposed solutions. What resulted is an innovative building that will serve as a beacon for Passive House buildings around the world.

1:10 PM Grove-Smith, Jessica; Gollwitzer, Esther

Passive House guidelines for indoor swimming pools

Based on in-use experience of the first completed Passive House indoor swimming pool projects and supplementary research, the Passive House Institute has released a comprehensive report and general guidelines of recommended efficiency measures for indoor pools. This contribution summarises the main findings.

Session 14:
Project Monitoring and Results

Room 7

11:30 AM **Menendez, Jesus**

Keeping overheating cool

This paper presents passive and active cooling strategies for Passivhaus buildings in warm and hot climates. Passive strategies include the orientation and geometry of the building, windows, shading devices, thermal mass, dense insulation and summer ventilation. Active HVLS fans are not considered within the PHPP but can improve the indoor climate with little energy input.

11:55 AM **Mori, Miwa**

Measured data of the Passive Town Phase 3 in Kurobe

Apartment units of the Passive Town Phase 3 Building J with EnerPHit cert. have been monitored for a year. Its energy consumption and indoor climate shows that cooling energy would not increase, if the air-conditioner is running constantly.

12:20 PM **Filippi, Marco**

Pilot Passive House in UAE – results from monitoring

An important feature of the very first PH in UAE is the monitoring system that allows to verify crucial parameters, such as the indoor quality and the energy consumption. The article shows the results from the monitoring over 2017/2018, comparing designed and measured values and identifying the chances for improvement for the PH in the very hot climate.

12:45 PM **Dermentzis, Georgios; Ochs, Fabian**

Three years of monitoring analysis of two multi-story net zero energy buildings

Two new multi-family Passive Houses that aim to achieve net zero energy building (NZEB) standard are monitored in Innsbruck. Monitoring results for three years are presented and discussed. The energy performance is also compared with the one calculated with PHPP. The importance of quality assurance control e.g. with monitoring is highlighted.

1:10 PM **Kaufmann, Berthold; Sheng, Sichen; Liu, Bin; Song, Binlei**

Qingdao PHTEC monitoring within two years of operation

Monitoring during two years of operation of the Qingdao PHTEC building shows that optimization of the building service systems operation strategies could improve the energy efficiency and keep the average indoor temperature (23°C) and relative humidity (48%) at a constant first class comfort level.

Session 15:
AZEB WORKSHOP Building Envelope

Room 8

11:30 AM Krick, Benjamin; Lowes, Edward

Component Award 2019 - Window of the future

The Award has been accomplished successfully. 23 companies from 12 countries took part with 31 products. The jury awarded 10 regular and 3 special prizes. High life cycle cost as well as CO₂ savings are possible with passive house windows. Care has to be taken of thermal bridges caused by shutter housings. But the award showed excellent solutions.

11:55 AM Freundorfer, Franz

20 years of development work on the Passive House window, a cool story

Wolfgang Feist's definition of criteria for windows usable in Passive Houses has changed the window world. The smaller wood window producer followed the findings of PHI scientists as the first group. The result is, that PH window quality is present as the highest level in beauty, sustainability and energy-plus cost efficiency.

12:20 PM Weber, Hagen

Passive House certified curtain walls /
The difficult relation between demand & reality

The requirements on passive house certified windows for cool temperate climate regions are versatile. Besides the required total U value and the corresponding reference glazing must also reach a value of $U_{w,installed} \leq 0.85 \text{ W/m}^2\text{K}$. And it's not only about the total U-value. All the specifications of the passive house certificates must be fulfilled.

12:45 PM Kramer, Roman

Reducing structural thermal bridge effects – A best practice study on Passive House projects in China

Established European thermal break solutions must be assessed regarding their compliance with Chinese building codes. Available systems for balconies and air-condition slabs (but also façade fixings) have already been successfully evaluated and approved by certified national test centres in China

1:10 PM López García, Soraya

PHI certification of transparent and opaque building envelope components

Comprehensive overview of the current level of development of Passive House Components globally. Presentation of the underlying principles of the Components Certification System, going. Brief overview of the standing certified components and outlook to current innovation challenges.

Session 16:
Sinfonia - Deep retrofits in Europe

Room 4

2:30 PM **Lepp, Laszlo**

SINFONIA – Selection of outcomes and best practice examples from Innsbruck

A Selection of implemented best practice solutions for energy efficient and affordable measures in large scale renovation buildings in Innsbruck will be shown in this presentation. Furthermore, an overview of the outcomes of SINFONIA will give an insight into this research project.

2:55 PM **Kislinger, Johannes; Huber, Martin**

Refurbishment of the primary school and gymnasium, Ziersdorf

A primary school and gymnasium built in the 1970s were substantially refurbished in terms of energy and function in the space of only 13 months. Thanks to cooperative project-management from the outset, a 94% improvement in energy performance was recorded while the building was in operation.

3:20 PM **Streicher, Wolfgang; Pfluger, Rainer; Sengl, Lukas**

Results of deep renovation of two austrian Schools

In the EU-project SINFONIA, two public schools in Innsbruck, Austria, built 1960 and 1955, were deeply refurbished and equipped with a ventilation system. A one year measurement campaign shows that all comfort criteria were met and the energy consumption after refurbishment was lower than predicted.

3:45 PM **Steinmüller, Bernd**

From experimental to Passive House Plus: Some 4-Decade insights

The oil crisis 1973 triggered energy and first Passive House research some 4 decades ago. The author, one of the “Passive House Pioneers”, is still active in the field and will share his insights gained on the road from early Experimental to latest Passive House Plus projects in new and old buildings.

4:10 PM **Schöberl, Helmut; Schriefl, Ernst**

EnerPHit renovation of a residential building in Vienna with preservation of its historical facade

In Vienna (Austria) a 19th century residential building was renovated after a gas explosion to a very good energetic standard (EnerPHit). The facades were insulated with hemp and aerogel plaster. As a result the external appearance of the historic building could be restored.

Session 17:

Room 5

Projects in cooling dominated climates

- 2:30 PM **Carranza Navarro, Pablo; Lorente Martin, Clara**
Basa I, Passivhaus multi-family dwelling in Zaragoza (Spain)
The paper covers the main passive design strategies that have been chosen to achieve energy balance in adverse climate conditions, describing how the Passive House five principles have been applied and the strategies used to simulate and achieve Passive House standard requirements.
- 2:55 PM **Sheng, Sichen**
Efficient cooling and dehumidification strategies for Passive Houses in warm and hot Climates
This paper summarizes the common cooling and dehumidification systems in PH and evaluates their efficiencies in different climates. It can give designers a first guideline how to choose an efficient cooling concept and show the manufactures what system could be suitable for PH in the future.
- 3:20 PM **Russo, Piero**
Cost-effective multi-family building in warm climate
A Passivhaus in Southern Italy at the same selling costs of a building meeting the minimum energy performance by code was the main target to achieve. Integrated design, also in the early stages and PHPP used as a design tool made it possible to optimise the envelope and an appropriate MEP solution.
- 3:45 PM **Wassouf, Micheel**
Chengdu mixed use building – a Passive House challenge in the heart of China
This paper aims at describing the passive and active strategies of a mixed-use building in Sichuan capital city of Chengdu, pretending to reach the Passive House standard. The presented building has a thermal floor area of 2637 m². Construction works are planned to start in July 2019.
- 4:10 PM **Sepulveda Corradini, Juan Pablo**
Meeting the Passive House standard through parametric design
A new 150-room, 6-storey student accommodation for Monash University in Australia, designed in Cross Laminated Timber (CLT). The architectural design was streamlined through Parametric Design and aligned with the University's commitment to reach net zero carbon emissions by 2030.

Session 18:
Policy and Financing

Room 6

2:30 PM Murschall, Hartmut

Passive Houses in 50 solar and 100 climate protection estates in the former coal and steel region North Rhine-Westphalia, Germany

Since the 1990s, NRW has been promoting Passive Houses: 6000 residential units, several other building types, and 150 solar/climate protection housing estates. Continuous governmental support for Passive Houses, with renewables in the context of urban development, is the most successful strategy.

2:55 PM Ploss, Martin

Only numbers count – life cycle costs in social housing

Austrian research project, KliNaWo, demonstrates that social housing projects with high energetic qualities can be realised with very little additional cost, of approximately only 3%. The measured energy consumption of 14 kWh/m²net dwelling area corresponds very well to the demand calculated using the PHPP.

3:20 PM Goossen, Carl-Peter

New finance model for apartments to approaches neutral living expenses before and after the EnerPHit renovation

New Finance model for home owners to approaches neutral living expenses after the deep retrofit. Financing is crucial to unlock the enormous potential of energy efficiency. With the savings on energy and the savings of 30 years maintenance the loan plus interest can be paid back easily.

3:45 PM Cunz, Thilo

Long-term monitoring of the successful energy-efficient Brunck-Quarter modernization

In 2001 BASF revitalized a residential district, the first time use of Passive House components in a district refurbishment. Ten years later a monitoring program confirmed that all buildings still perform as expected. Achieving nearly the Passive House standard in a modernization is currently possible with a payback of 20 years (2018).

4:10 PM Alter, Lloyd

Framing the conversation: How do we talk about Passivhaus

On TreeHugger website ca. 300 Passivhaus stories are published. We looked at what posts and titles interest readers the most, analyzing content and comments to see if there are themes and trends. The intent of this work is to determine what attracts the public to the concept, and how to frame the argument for Passive House.

Session 19:
China: Residential Passive House Projects

Room 7

2:30 PM **Demmler, Rolf**

Tianjin Eco-City residential high-rise Passive House

A case study of the holistic design approach to design and construction of two Passive House residential high-rise towers in Tianjin's Eco-City and implemented strategies for wider replication. Once certified (summer 2019), the towers will be considered as among the tallest Passive House buildings in Asia.

2:55 PM **Li, Chun; Gao, Jianhui**

Optimization of U value of external insulation of exterior walls and g-value of glass in hot-summer and cold-winter regions

With a project in Wuhan located in hot summer and cold winter areas of China as an example, this paper analyses the influences of U-value of external insulation of exterior walls and g-value of glass on energy consumption of the building through PHPP software and the control variable method, and discusses the methods and ways for optimization of parameters.

3:20 PM **Jiang, Fuzhao**

Design, optimization and construction of 40# residential building project phase I in Beijing (Caofeidian) modern industry development experimental zone (first start zone of eco-city)

In the design process of Passive Houses, the physical elements, including building envelope, doors and windows, thermal bridges and ventilation shall be considered. In the meantime, the living habits of the future residents that directly affect the actual energy demand of the building during use in the future shall also be taken into full account.

3:45 PM **Radeva, Gergina**

Multifamily homes in China – initial design, optimisation potential and the impact of it

Optimising the building's architectural design and the building technology is a confident way to go to achieve a better building performance, e.g. low energy consumption and low carbon footprint.

- 4:10 PM **Zhang, Huanlin**
Huangshan reception Center project of Shandong Hua Jian Aluminium Industry Group
In the construction of light steel passive house, the key to reach the standard of passive house is as following: Focus on dealing with the air tightness of the house, layout air-tight film, paste airtight tape to meet the requirements of the standard, the careful and serious work of the construction staff.
- 4:15 PM **Stefan, Schirmer**
Social Housing in Beijing in Passive House standard
A residential high-rise building with 240 apartments is build in Beijing according to the Passive House standard for socially disadvantaged people. Besides a well-insulated and airtight thermal envelope challenges, are building services with two central ventilation systems with heat recovery and the fresh and exhaust air of kitchen area in the 25m² small units.
- 4:20 PM **Chen, Shou-Kong**
Sunyoung Pavilion - A Passive House in Shanghai
Sunyoung Pavilion, build in 2018, is the first certified passive house building in Shanghai after the German Pavilion of EXPO 2010. Wood structure filled with rock wool insulation, triple glazing windows, as well as ventilation system with heat and humidity recovery and integrated heating/cooling fulfil the PH-standards.
- 4:25 PM **Byoungyeol, PARK**
A Passive House Village in Korea
We succeeded to realize 18 certified Passive Houses or Low Energy Buildings in a small settlement. Among 18, 6 achieved the Passive House standard and 12 the Low Energy Building standard. The reason why only 6 achieved the Passive House standard is that majority of the houses (11) are east oriented.

Session 20:
WORKSHOP: Design Tools

Room 8

- 2:30 PM **Steiger, Jan**
PHPP 10 - The design tool for robustness and future proof buildings
In PHPP, the Passive House standard can be verified using standard assumptions for climate or boundary conditions. PHPP 10 will contain various evaluation possibilities to also assess the performance of the buildings under extreme situations, like extreme climate conditions, for example due to climate change, or extreme user behavior or building use.
- 2:55 PM **Chen, Cheney; Collins, Cillian**
Explorations in Optimizing PHPP using Grasshopper
This paper showcases computational design processes and tools Perkins and Will Architects in Vancouver are exploring in order to help early stage design on large scale projects aiming for the Passive House Standard. The future ambition is to integrate PHPP into Design Space Construction (DSC).
- 3:20 PM **Schnieders, Jürgen**
PHPP validation according to ASHRAE 140
The ASHRAE standard 140 is a test suite for building simulation programs that contains results for the annual heating and cooling demand for a reference building and 20 variants. The PHPP successfully passed this test.
- 3:45 PM **Bastian, Zeno; Reyes Bernal, Elena; Grove-Smith, Jessica**
Project-specific primary energy requirements for Passive House certification
This paper outlines the methodology used to derive PE/PER targets for large residential projects applying for an exemption. These are calculated with a tool that is linked to a PHPP file, giving a new PE and PER target based on the sum of primary energy requirements for individual end-uses (such as lighting, elevators, etc.).
- 4:10 PM **Hasper, Wolfgang**
Performance Monitoring Evaluation with PHPP 10
PHPP V10 will comprise tools for simplified performance evaluation of buildings. To this end the energy balance calculations can be updated with the measured boundary conditions of the period under consideration. Thus the building's operation can be followed up on a monthly basis. Deviations from the designed performance are detected early on and may be traced back and rectified systematically.

4:35 PM **Schnieders, Jürgen**

A calculation procedure for the heat losses caused by vented drain pipes

Drain pipes inside the thermal envelope that are vented to the outside cause additional heat losses. The existing calculation procedure from PHPP 9 was updated to account for the gradual warming of air flowing through such pipes. Particularly for high-rise buildings lower heat losses result.

Austria - Workshop:

Austrian pioneers of Passive House and Passive House Plus

1:45 PM Reinberg, Georg

Austria, Passive House and Reinberg`s Architecture: an evolution 1982-2020

The Austrian architect Georg W. Reinberg looks back to the development of his architectural work. He presents projects which can be seen exemplary for the evolution of the Passive House and it`s technic during this time. He gives also an outlook how could be the new develop in the near future.

2:00 PM Streicher, Wolfgang

New and refurbished low Cost Passive Houses in Tyrol/Austria – Technology and Results of Measurements

In Innsbruck, Austria many multifamily buildings are built in Passive House standard. Additionally renovation of buildings to very high energetic level has started. Accompanying measurement campaigns show that all comfort criteria are met and the energy consumption is close to the predicted values.

2:15 PM Krapmeier, Helmut

Austrian State Award for Architecture and Sustainability.

Since 2006, the Austrian Ministry of the Environment has been rewarding the State Prize for Architecture and Sustainability. The multitude of objects impressively proves that high-quality architecture and ambitious requirements for sustainability do not contradict each other, and are a clear and effective sign of climate and environmental protection.

2:30 PM Lepp, Laszlo

Awarded Chinese office buildings – Certified supermarkets and other non-residentials from Austria.

Passive House office buildings, supermarkets, hotels or student dormitories in China and Austria - quality assured and certified residential and non-residential Passive House buildings are a success story of the Passive House Institute in Innsbruck.

2:45 PM Huber, Martin

Lower Austrian State Buildings as Pioneers of the Passive House Standard.

In 2008, the Federal State of Lower Austria decided to construct all its state buildings in accordance with the passive house standard. Thus, beacon projects were used to initiate the development of know-how and the gathering of practical experience in the construction industry. The local construction industry was thus able to achieve a competitive advantage.

3:00 PM **Schriefl, Ernst**

World's first plus-energy office high-rise building (Vienna, Austria).

In Vienna a former high-rise laboratory building from the 1970s was renovated to an office-building in plus-energy standard (feeding more electricity from PV into the power grid than energy needed for building operation and use). An extreme reduction of energy demand through the optimization of 9,300 components was crucial to achieve this standard.

3:15 PM **Michulec, Dawid**

Lessons learned after 5 years of pioneering work in ASIA.

During the execution of the first certified passive house buildings in the cool temperate north and the first passive house buildings in the humid south as well as the trainings of the most certified passive house planners in the People's Republic of China by Dawid Michulec, NEUBAU best.energy many interesting experiences could be gained.

3:30 PM **Aichholzer, Martin**

It's always a question of resource.

With the establishment of the Passive House standard and standards that create buildings producing energy it was achieved a lot in terms of resource conservation. The great ecological footprint of the postindustrial states shows that a huge amount of work has to be put into the further reduction of resource consumption in the construction industry.

3:45 PM **Turrini, Marcello**

Green building Solutions for students – Summer Design workshop.

Organized since 2011, the G.B.S. Summer School provides the alumni (320 from 76 countries so far) the expertise to design a Passive House and to make it the center of a holistic approach that enhances its sustainable features. My talk promotes the duplication of our concept in other countries.