

Index and Programme

Friday 25th April 2014

Plenary Session 09:00 – 12:00

Europa Hall

09:00 Opening and Greeting

Prof. Dr. Wolfgang Feist

University of Innsbruck

and scientific director of the Passive House Institute

Organizer of the International Passive House Conferences

Johannes Remmel

Minister for Climate Protection, Environment, Agriculture, Nature
Conservation and Consumer Protection of the German State of
North Rhine-Westphalia

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Marcel Philipp

Mayor of the City of Aachen

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Lothar Schneider

Director of the EnergyAgency.NRW

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Heinrich Bottermann

The Passive House – an established construction standard on the
way to energy revolution

57

Diana Ürge-Vorsatz

Energy efficient buildings – an important opportunity to mitigate
climate change

Wolfgang Feist

Passive House is more...

61

Quantitative criteria can be derived for the functional Passive House criterion in all climates zones, and in each case, ventilation systems are able to ensure the overall level of comfort from the air exchange rate already required for hygiene. The resulting demand for heating and cooling energy is automatically very low – low enough to be covered by locally available renewable sources everywhere. But such optimization does much more; after all, a good building envelope and controlled ventilation provide comfort benefits, guarantee a building's long service life, and keep costs down, as this paper illustrates with examples.

Session I:		Europa Hall
PH on the regional level (PassREg)		
13:00	Leidinger, Ulrike; Wendel, Eckhard The City of Aachen - on the way to Passive House The City of Aachen has adopted the Aachen Standard, which is similar to the Passive House Standard. The first experience with 12 buildings shows that building services do not need to be complicated. We believe that intensive monitoring – called "work phase 10" here – is necessary.	71
13:25	Murschall, Hartmut Energy efficiency in North Rhine-Westphalia: political commitment and Since the late 1990s, North Rhine-Westphalia has supported the use of Passive House technology. Up to now, 3,700 residential units and various nonresidential buildings have been constructed in compliance with the Passive House Standard. Some 10,000 people now live in 150 solar and climate protection neighborhoods.	77
13:50	Linder, Mathias The City of Frankfurt: 10 years of experience with public Passive House buildings Since 2004, the City of Frankfurt has completed 61 Passive House projects. Experience from these projects was used in formulating the 2014 Guidelines on Affordable Building. The Passive House Standard can be affordable for around 90 percent of municipal construction projects.	81
14:15	Stephan, Michael Tradesperson and designer network in the Aachen region Tradespeople and designers registered in a special network as an energieeffizienzFACHBETRIEB or energieeffizienzPLANER must pledge to follow the Energy Code. The network plays a part in increasing the retrofitting rate and improving energy efficiency in energy-focused retrofits of existing buildings in the Aachen region.	87
14:40	Klawitter, Inga; Probst, Jacques Energy concept and sustainable design in Belgium's German community The German-speaking community of Belgium is currently working on an energy concept to be presented in April 2014. At the same time, a sustainable building decree is also in the works; it will specify eligibility for funding for public buildings.	93

- 15:05 **Lehmenkühler, Markus; Leidinger, Ulrike; Fischer, Peter** 99
E-View - an online monitoring system not only for public administrative
bodies
- The City of Aachen has developed a new tool for the monitoring and
visualization of energy consumption in its own buildings: E-View. The system
provides detailed information about consumption based on data from 1,000
meters in 196 buildings. It is being further developed in cooperation with regio
iT.

Session II:
Ventilation

Brüssel Hall

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|-------|--|-----|
| 13:00 | Strauss, Rolf-Peter
Ventilation - simple and elegant!

This paper presents a semi-central residential ventilation system integrated into the façade around windows. Simple and visually subtle ventilation solutions can be implemented, even under difficult retrofitting conditions. The concept relies on an innovative enthalpy exchanger made of folded paper. | 105 |
| 13:25 | Martin, Bernhard
A new ventilation concept for small dwelling units

A satisfactory ventilation solution for small Passive House residential units has been lacking on the market. With its installation location in an outside wall, connections for other rooms, and sensor-controlled demand management, the new freeAir 100 system from bluMartin can meet that need. | 109 |
| 13:50 | Rojas-Kopeinig, Gabriel; Pfluger, Rainer
Cascade ventilation - air exchange efficiency in living rooms without separate supply air inlets and exhaust air outlets

CFD simulations and measurements were used to study whether and to what extent airflow between outlets can short circuit if the outlets lead to a common hallway. Planning tips for expanded cascade ventilation (without fresh air outlets in the living room) were derived from the investigation. | 115 |
| 14:15 | Pfluger, Rainer
Heatpipes for frost protection in PH ventilation systems

Large heat recovery systems often use a hydraulic brine circuit for preheating the air for frost protection. To avoid high invest and maintenance costs, the heat pipe principle can be applied. This contribution shows the principle and gives a comparison on efficiency and live cycle costs. | 121 |
| 14:40 | Lautner, Rainer
Highly efficient ventilation systems with rotation heat exchanger for Passive House buildings

This paper describes how rotation heat exchangers work and sheds light on planning aspects. Rotors from Lautner Energiespartechnik have heat recovery efficiencies exceeding 90 percent with pressure losses of only 30 Pa. The units cannot freeze up and are therefore highly efficient year-round. The output of heating systems can be reduced in line with the level of heat recovery. | 129 |

15:05	Brandmeier, Thomas Outdoor installation and special considerations for air handling units	137
	Sibille, Elisabeth; Pfluger, Rainer; Gritzer, Florian; Happach, Adrian Development of a coaxial-duct as outdoor air inlet and exhaust air outlet for ventilation units	139
	Woollett, John; Vladykova, Petra; Börjesson, Mikael Rotary heat exchanger: practical experience	141

Session III:
Retrofit

Berlin 1 Hall

- | | | |
|-------|--|-----|
| 13:00 | <p>Ebel, Witta; Kaufmann, Berthold
Economy and financing of efficiency: new buildings and renovations</p> <p>Methods, the correct assignment of costs and the assumed boundary conditions have a high influence on the results of an economic assessments. For buildings, this has to be based on life cycle costs. Well documented projects show that EnerPHit retrofits are profitable compared to capital assets on the market where high returns cannot be expected for risk-free investments. Read more on cost optimality and the EPBD, step by step retrofit and the EuroPHit project, financing and funding ...</p> | 145 |
| 13:25 | <p>Keig, Peter; Hyde, Trevor
Analysis of the operational energy performance of a retrofitted solid wall terraced house versus designed performance</p> <p>A UK Victorian house was retrofitted to reduce energy and CO2 emissions. The design was based on an analysis of retrofit measures using PHPP. Designed performance is compared with twelve months of operational performance. Results show a close correlation between PHPP and operational performance.</p> | 155 |
| 13:50 | <p>Sap, Herwin; Rovers, Ronald; Vincken, Maurice
A concept for a quick and clean passive house renovation for mass housing in the Netherlands</p> <p>In Kerkrade West 153 social houses of a common Dutch typology have been renovated to passive house standard with a prefab renovation concept. Renovation took only 10 days, while keeping the house inhabited. This concept was developed by a integral design team. Housing costs for the tenants (rent & energy) has decreased because of this renovation.</p> | 161 |
| 14:15 | <p>Troi, Alexandra; Lucchi, Elena; Exner, Dagmar; Freundorfer, Franz;
Energy efficiency of windows in historic buildings</p> <p>A method for improving the energy efficiency of the windows in historic buildings is presented. After explaining the heritage value of historic windows and the development of a holistic façade concept, the replacing of an existing window with a high efficient system is discussed.</p> | 167 |
| 14:40 | <p>Paticas, Harry; Clarke, Alan
Monitoring building fabric moisture in historic house retrofitted with internal insulation</p> <p>This paper reports on the design approach and fabric moisture monitoring undertaken for the thermal upgrade of a listed London townhouse. The hygrothermal performance of woodfibre and aerogel insulation with a range of U-values are appraised following an analysis of the first 8 months of readings.</p> | 173 |

- 15:05 **O'Leary, Tomas** 179
Ten Trans-European EuroPHit projects lead the next wave of Passive House promotion
- Whilst EnerPHit results in a significant reduction in heating and cooling demand, achieving this in one go is often difficult due to limited resources. The EuroPHit project aims to demonstrate how EnerPHit can be reached on a 'Step-by-Step' basis, using 13 diverse case study projects in different climatic regions of Europe.

Session IV:

Berlin 2 Hall

Day-care centres / schools

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|-------|--|-----|
| 13:00 | Künzel, Kay
"KlimaKita" in three weeks - An affordable retrofit for a Passive House day care centre
Entertaining presentation about the approach for expanding and retrofitting a day care centre with only three weeks for construction. The work done by 22 trades had to be coordinated. The focus is on innovative building automation and the affordability of the Passive House Standard. | 187 |
| 13:25 | Heinicke, Robert; Beckmannshagen, Lars
The "House by the lake" - QA considerations for a community center in the East of Hamburg
A planned community center was redesigned and completed as a Passive House building under difficult conditions and with tremendous pressure to finish construction on time. This paper presents the project, discusses problems, and investigates actual consumption, which is significantly higher than originally planned. | 193 |
| 13:50 | Ostrop, Patrick
Passive House school and educational centre "Tor zur Welt" in Hamburg
Along with urban development and pedagogical architecture, the objective of IBA Hamburg 2013 was to build a Passive House school that could serve as an impressive example of forward-looking public construction and encourage users and visitors to get more involved in sustainability. | 199 |
| 14:15 | Heuer, Helmut
Certification and architectural quality – a contradiction?
Inspired by the question of whether engineering and design oppose each other, this paper recommends that both aspects be given equal importance. Historical and contemporary examples and descriptions of methods demonstrate that sustainable, user-friendly architecture is possible. | 205 |
| 14:40 | Göttsche, Joachim; Röther, Sascha
Science College Overbach: Passive House school in Jülich-Barmen
The Science College Overbach is an innovative educational center in Jülich-Barmen that can serve as a beacon. Constructed in 2009 as a building close to Passive House quality, the SCO uses a LowEx concept that is complemented by light-diffusing mirrors and dimmable glazing. | 211 |

- 15:05 **Endhardt, Martin** 217
- Passive House day-care centre with class rooms in prefabricated concrete construction
- The day care center was built with prefabricated double-shell concrete walls. The various use areas were viewed separately in the planning and design of the ventilation system. Energy-efficient kitchen technology and the cafeteria's ventilation system (including extract air from the dishwasher and combi-steamer) intelligently uses the grease-free waste heat from the kitchen.

Session V:		Europa Hall
Components: building envelope		
16:00	Krick, Benjamin PHI window certification: cold and arctic climates This paper presents the Passive House Institute's window certification program and identifies factors that significantly contributed to its success. Financial aspects of different glazing types in Europe and the potential for future improvements in glazing are discussed.	225
16:25	Pazen, Günter Passive House windows are cost-effective! This paper discusses the evolution of ENERsign windows, the production of current models, and the cost effectiveness of various products under different climatic conditions.	235
16:50	Ziegler-Herboldt, Patrick Presentation of certified curtain wall substructure components & experiences Increasing orders and positive feedback demonstrate that this is a high-performance substructure system that can be used with almost all surfaces. Sold by StoAG, StoVerotec's PHI-certified substructure systems for rear-ventilated curtain façades are solutions that are technically and financially in line with national and international market demands.	241
17:15	Zeller, Klaus Two residential building projects with monolithic masonry walls in Cologne This paper discusses the planning and construction of two residential buildings (8 and 16 residential units) with single-shell outer walls without additional insulation. Problems and solutions are presented for building structure, details, and construction.	247

17:40	Muskatewitz, Adrian Challenging connection details and their impact on the heating demand	253
	Kethorn, Björn Durable airtightness of joints between windows and walls	257
	Gollwitzer, Esther Optimisation of roller shutters and exterior blinds	259
	Park, Sihyun; Song, Seung-Yeong; Lim, Jae-Han Comparative evaluation of EIFS using VIPs for better performance	261
	Andreau-Wiedenmaier, Annabelle; Sanders, Helen Electronically tintable glass: greater design freedom without compromise	265

Session VI:		Brüssel Hall
PH design tools		
16:00	Vallentin, Gernot; Vallentin, Rena Design principles for Passive House buildings: illustration of completed day-care centres This paper discusses the connections and reciprocal effects between the concept design and energy-focused construction of Passive House day care centres, urban planning and functional requirements, and design.	269
16:25	Bastian, Zeno Variant calculations and economic assessment with PHPP 9 The upcoming version 9 of the PHPP allows the user to calculate several designs of the same building. The findings are displayed in parallel and updated in real time. Two designs can also be selected for their energy demand and financial feasibility to be compared in depth.	275
16:50	Regner, Pia; Lamprecht, Birte Simulation and construction of cost-effective Passive House schools with minimised mechanical systems Despite high heat input from a large number of users, many public Passive House new builds and retrofits use at least two heat distribution systems. This paper refers to simulations of an annex to the public trade high school complex in Ansbach and discusses its energy concept in order to analyze how doing away with radiators in the classrooms affects usage quality, energy consumption, and financial aspects. Financial information on several public Passive House construction projects is also provided for comparison.	281
17:15	Schütze, Alexandre Sensitivity analysis with PHPP This paper shows how statistical analysis of existing PHPPs can provide valuable insights for planning multi-family dwellings. The main parameters are identified using a sensitivity analysis, and a method for estimating heating energy demand is presented.	287
17:40	Kuhne, Inga-Lill; Marmann, Michael; Nordhoff, Andreas ecolearn - Passive House experts at your fingertips	293
	Hasper, Wolfgang; Winkel, Susanne; Weber, Christine Advance! Education!	295

Session VII:		Berlin 1 Hall
Climatic challenges		
16:00	Ferrario, Fabio The first Certified Passivhaus hotel in Italy Best example of green building in Trentino-Sud Tirol (Italy) according to the Regional Water Resources and Energy Agency competition in 2012, the EcoHotel Bonapace in Nago Torbole is the first Near Zero Energy Hotel in Italy certified by the Passivhaus Institut with the collaboration of ZEPHIR.	301
16:25	Vallentin, Rena; Vallentin, Gernot Seminar and Youth-Guest-House - a flagship project in Korea Korea's largest Passive House project was successfully implemented through extensive exchange between German planners and Korean builders. To cope with climatic and cultural challenges a quality management framework was set up to ensure high standards of architectural design and energy efficiency.	307
16:50	Greindl, Thomas An ecological and sustainable Passive House 300 km south of the northern Arctic Circle The international Passive House definition can be implemented in the subarctic climate zone and built by students learning construction-related trades. An attempt to reduce overall environmental impact throughout the lifecycle must focus not only on heating demand but also on construction material selection.	313
17:15	Mauring, Tõnu; Hallik, Jaanus; Kalbe, Kristo; Valge, Margus Winter performance of certified Passive House building in Northern European cold climate	319
	Krauklis, Ervins; Reinberga, Mare Design, optimisation, construction and operation of a large single-family Passive House in Riga	321
	Szalavicz, Anca Can the Passivhaus Standards be adapted to high-rise residential buildings in South Africa?	323
	Marcelino, João; Gavião, João The performance of the first Passive Houses in Portugal: the path to sustainability	325
	Rosemeier, Kara Is mechanical ventilation dispensable in temperate climates?	327
	Vicente; Rodrigues Passivhaus economic feasibility for Portuguese climate	329

Session VIII:

Berlin 2 Hall

EnerPHit refurbishment

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| 16:00 | Rongen, Ludwig
Heinsberg Protestant Christ Church - EnerPHit refurbishment, conversion and extension

Interior insulation was added to the Christuskirche church in Heinsberg as part of an energy-focused retrofit in line with the EnerPHit Standard. The planning process included an analysis of the conditions for the retrofit, especially the suitability of the brickwork, based on laboratory studies carried out by IBAC and simulation calculations conducted by PHI. | 333 |
| 16:25 | Oehler, Stefan
Conversion of a trading post into a multi-family building with lofts

A fashion company's warehouse was turned into a modern multi-family building with loft apartments with Passive House components at low cost. The renovation had to be extended for cost reasons so the EnerPHit standard will be attained in two phases. The first phase paved the way for all measures that will be included in the second phase. | 339 |
| 16:50 | Reinberg, Georg
Passive House refurbishment with extension and redensification under challenging conditions

In Kierling bei Wien, a residential complex originally built in 1979 underwent a retrofit while inhabited, and a timbered annex was added to the roof. A new building was also constructed, and both buildings now have central heating based on solar and biomass. Central Passive House ventilation heating lowered the cost of the retrofit. | 345 |
| 17:15 | Anlauff, Eva
Cultural heritage preservation award for an energy retrofit - prevention of structural damage, cost-effectiveness and regulatory compliance

In 2001, the City of Nuremberg began installing interior insulation in the Herrnschiesshaus, a protected heritage building constructed in 1582-83. Measurements from behind the insulation and at the wooden beam heads show that the structures are free of damage. The complete retrofit of the building was completed in 2011. Heating energy consumption is now about half what it was before the retrofit. In 2012, the retrofit project was awarded the Bavarian Cultural Heritage Preservation Prize. | 351 |

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- 17:40 **Ottinger, Oliver; Vahalová, Eva; Bräunlich, Kristin; Kaufmann, Berthold** 357
- Comparison of four interior insulation systems - measurements and hygrothermal simulations
- The measured temperature and relative humidity evolution in a wall construction with four different interior insulation systems is compared with hygrothermal simulation results. For better adoption a parameter variation is conducted and results are discussed.

Saturday 26th April 2014

Plenary session 09:00 - 10:15

Europa Hall

- 09:00 **Vincent Berrutto**
Head of Unit for Energy Efficiency, European Commission
– Executive Agency for Competitiveness & Innovation
(EACI)
- 09:15 **Pat Cox**
German know how – Irish can do – A sustainable
enterprise and innovation
- 09:45 **Grégoire Clerfayt**
2015 – Brussels goes passive – from stimulation to
regulation

Session IX:

Europa Hall

Swimming pools, hospitals, super markets

- 10:30 **Kaluza, Jörn** 375
Improving the electricity efficiency of indoor swimming pools
When it comes to primary energy consumption in Passive House swimming pools, electricity dominates. This paper uses practical examples to present possibilities for optimization and power savings, especially in terms of ventilation and pool water treatment equipment.
- 10:55 **Grove-Smith, Jessica; Peper, Søren** 381
Energy efficiency in Passive House swimming pools: demand and consumption of the "Lippe" bath
In 2013, analysis of the data gleaned from monitoring in the first two years of operation of the Passive House indoor swimming pool in Lünen was completed. This paper discusses key findings with emphasis on the comparison of energy demand calculations to measured consumption, and derives planning values from the findings.
- 11:20 **Bräunlich, Kristin; Kah, Oliver** 387
Aspects of efficient ventilation in hospitals
Ventilation makes up a large share of total energy demand in hospitals, with especially high air exchange rates required in specific areas. Optimized control of outdoor air demand and a reduction in pressure losses for individual components provide considerable energy-savings potential.
- 11:45 **Kah, Oliver; Bräunlich, Kristin; Schulz, Tanja** 393
Baseline study - implementing the Passive House concept in hospitals
To evaluate and tap the conservation potential of retrofits and energy-efficient new builds, the State of Hesse studied basic issues for the implementation of the Passive House Standard in hospitals. This paper presents the main insights from the baseline study.
- 12:10 **Lepp, Laszlo; Schnieders, Jürgen; Feist, Wolfgang** 401
Passive House super markets on the rise: requirements, examples and results
Refrigeration of goods consumes the most energy in supermarkets. Ideally, the waste heat resulting from the process can be used to cover the supermarket's heat demand without additional heating technology. In the Passive House supermarkets already completed, efficiency improvements led to significant reductions in power consumption.

Session X:

Brüssel Hall

PH and renewables = NZEB

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| 10:30 | Huber, Manfred; Gassmann, Stefan
Field report: Nearly-zero energy multy-family building with load management

In a building with a well insulated envelope, much less heating energy is needed for space heating than for hot water. An outdoor air heat pump combined with a photovoltaic array and demand management allows a large part of the energy demand to be covered with power produced directly on the building. | 409 |
| 10:55 | Deimel, Christoph
Contemporary design in Berlin: From Passive House to Plus energy building

Three projects designed by Deimel Oelschläger from 2006 to 2014 demonstrate the evolution to highly efficient Passive House buildings that produce more energy than they consume. The paper presents structural and technological developments and their impacts on buildings' energy demand. | 415 |
| 11:20 | Wortmann, Ralph; Wember, Klaus
Passive and zero-emission refurbishments

How can a post-war building be retrofitted for Passive House? Even in such retrofits, affordable, future-proof building concepts that are architecturally attractive can be constructed in compliance with the Passive House Standard to produce nearly zero-emission buildings. But it takes teamwork, and you have to want it. | 421 |
| 11:45 | Varga, Edith
Evaluation of a Passive House settlement according to DGNB criteria

Because of the complexity of the scoring system, the difference between the Passive House Standard and the KfW-70 standard are not reflected in the DGNB sustainability score. The benefits of the Passive House Standard are only clear if ecological parameters are also taken into account. | 427 |
| 12:10 | von Ballmoos, Christian
Palazzo Positivo - refurbishment of a multy-family building in Chiasso to plus energy level with BIPV

A multi-family dwelling originally built in 1965 was retrofitted to the Passive House Standard. Thanks to intelligent use of current materials and technical equipment, including using thin film PV panels as façade cladding, a Plus Energy Building could be constructed in an urban environment. | 433 |

12:35	Garg, Vishal Design of a cost effective net Zero Home for Ahmedabad - India	439
	Yeats, Andrew; Clarke, Alan Lancaster Cohousing. 41 Passive Houses with on-site renewable energy distribution	441

Session XI:
North America

Berlin 1 Hall

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| 10:30 | <p>Cohen, Adam
Built comparison of a Passivhaus and a standard American dormitory - a twin study</p> <p>The opportunity to study 2 commercial buildings of similar design, size, construction methods and usage pattern is a rare and golden one. At Emory and Henry College in Virginia 2 dormitories, 1 of standard construction and 1 of Passivhaus construction are complete and ready for side by side comparison.</p> | 445 |
| 10:55 | <p>McDonald, Timothy
Strategies for affordable, modular and multifamily PH housing in the USA</p> <p>The Belfield Townhomes project, the first Certified Passive House project in Pennsylvania, is subsidized, "social" housing in the City of Philadelphia. The broader goal of the project was to demonstrate that Passive House, and therefore Net-Zero-Energy-Capable, buildings can and should be, at virtually no cost premium, standard in the United States.</p> | 451 |
| 11:20 | <p>Cohen, Adam
Design & construction of the LDS Dental Clinic</p> | 457 |
| 11:45 | <p>Rügemer, Jörg
Maximizing the Passive House at market rate - Utah's most energy-efficient and cost-effective house</p> <p>This paper evaluates the Passive House strategy when set in context to a given budget. Using average market rate costs for a comparable code standard building, the author explored how much energy-efficiency can be achieved in a single-family home without becoming substantially more expensive.</p> | 459 |
| 12:10 | <p>Isaacs, Malcolm
Passive House economics: A simplified North American approach</p> <p>This four-project study suggests a simplified approach to improve marketing of the Passive House Standard in Canada. It looks at total monthly cost of building ownership from the first month as the prime criterion of economic viability, not NPV, simple payback, total added cost or % added cost.</p> | 465 |
| 12:35 | <p>O'Malia, Matthew; Gibson, Alan
Design/Build/Refine/Repeat: A systems approach for Passive House construction in North America</p> <p>This presentation explores Passive House design and construction in the cold climate of the Northeastern United States and the development of a regional, wood framed, lightweight construction system that meets PH requirements. Monitored data and lessons learned will be discussed.</p> | 471 |

Session XII:

Berlin 2 Hall

Passive House regions (PassREg)

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| 10:30 | Scherer, Udo; Wohlfahrt, Matthias
Promoting efficient building: The PassREg principle in the Hannover Region

proKlima initiiert über Förderung Passivhaus-Pilotprojekte. Die Erkenntnisse daraus werden mit der Klimaschutzagentur in der Region Hannover verbreitet, um Nachahmer zu generieren. Priorität liegt auf der Vernetzung und Wissenstransfer. Der Beitrag gibt einen kurzen Einblick in die gemeinsame Arbeit. | 479 |
| 10:55 | Leardini, Paola; Cholmondeley-Smith, Brooke
How do Passive Houses perform in New Zealand? From simulation to facts

Monitoring the first two certified PHs in New Zealand has allowed verifying their overall performance and the associated energy savings, validating the PHPP as a suitable design tool for this country. New materials, construction methods and skilled labour opened the market to a new affordable, yet highly performing, housing model. | 485 |
| 11:20 | Siddall, Mark; Johnston, David; Fletcher, Martin
Occupant satisfaction in UK Passivhaus dwellings

Within the UK there has been scepticism about whether Passivhaus buildings can offer high standards of comfort and occupant satisfaction. This paper examines the results from a survey that has been undertaken in order to develop a better understanding as to whether or not this scepticism is warranted. | 491 |
| 11:45 | Peuhkuri, Ruut
Indoor environment in 126 Danish Passive House apartments heated by ventilation air

The indoor climate of 126 social housing apartments in 9 identical blocks in Køge, Denmark was studied with field measurements and questionnaires. The buildings are certified as Passive Houses and the apartments have supply air heating system with individual control in every room and adjustable external shading in most East and West facing windows. | 497 |
| 12:10 | Miščević, Ljubomir
The first twenty Passive Houses in Croatia | 503 |

- 12:35 **Rose, Clarence** 509
PassREg Solutions Open Source www.passregsos.passiv.de
No need to reinvent the wheel – or Passive House solutions. That is the guiding principle of this database for the regional implementation of Passive House with renewable energy, which encourages users to share solutions and helps overcome difficulties of the energy transition throughout Europe.
- Tzanev, Dragomir; Genchev, Zdravko** 513
PassREg Solutions Open Source www.passregsos.passiv.de
No need to reinvent the wheel – or Passive House solutions. That is the guiding principle of this database for the regional implementation of Passive House with renewable energy, which encourages users to share solutions and helps overcome difficulties of the energy transition throughout Europe.
- Pietrobon, Marco; Pagliano, Lorenzo** 519
Mediterranean Passive House solutions towards nearly zero energy buildings in italian regions

Session XIII:

Europa Hall

Living: examples and mechanical systems

- 14:30 **Treberspurg, Martin** 525
Passive House residential complex in Vienna's Kaisermühlenstraße
A Passive House can be an optimal solution for building sites subject to high noise pollution by taking advantage of thermal and acoustical buffer zones in the form of access ways and the use of a semi-central ventilation for the residential units.
- 14:55 **Müller, Michael** 531
Passive House dormitory
Passive House buildings can meet all of the requirements of sustainable construction. The project presented in this paper can even react to changes in tenant populations with different floor plans ranging from shared student apartments to standard apartments in accordance with the Residential Funding Program.
- 15:20 **Tappler, Peter** 537
Indoor air quality in energy efficient residential new builds
A study investigated and assessed air quality in mechanically and naturally ventilated residential buildings in order to determine the extent to which concentrations of individual indoor air components and perceived well-being differ among differently ventilated buildings.
- 15:45 **Schnieders, Jürgen** 543
Experience with a drain water heat recovery
Data were recorded for a heat recovery system for shower water installed in a single-family home. The annual utilization rate is 23 percent, making the system financially interesting depending on individual situations. The paper also includes a brief theoretical analysis and planning recommendations.
- 16:10 **Nolde, Erwin; Heinhaus, Uwe** 549
Grey water recycling and heat recovery - a steppingstone from Passive House to zero-energy buildings?
Distributed heat recovery is important for low-energy buildings because it provides a large share of the heat needed for hot water provision year round. In combination with gray water recycling, the savings in water can provide significant economic benefits.

Session XIV:
Experiences: integrated design and use

Brüssel Hall

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| 14:30 | Müller, Astrid
Energy concept Aachen Richtericher Dell | 557 |
| <p>An ecologically and economically sound urban planning concept was developed for this project in order to set conditions related to planning law and contractual obligations that would ensure energy-efficient construction. Energy standards, energy supply variants, and building envelopes were analyzed for relevant building types.</p> | | |
| 14:55 | Lückerath, Peter
Interface management in Passive House buildings | 563 |
| <p>Excellent cooperation between designers and tradespeople is essential for Passive House, more so than for all previous construction standards. To this end, the City of Geldern and the Environmental Center within the Düsseldorf Chamber of Small Industries and Skilled Trades worked with partners to develop a short course on "Interface management in Passive House buildings."</p> | | |
| 15:20 | Höffle, Ingo
Integrated design and cost-effectiveness of Passive House office buildings | 567 |
| <p>The task the investor set forth was to build an office building to the Passive House Standard, rather than the EnEV standard, at a maximum cost premium of 1% over EnEV. To achieve this, every design issue had to be fundamentally questioned and optimized, which led to intense interaction among everyone involved in the planning and improved the overall quality of the building.</p> | | |
| 15:45 | Frohn, Bernhard
Balanced Office Building - BOB.Aachen: 10 years of building use | 573 |
| <p>Energy-efficient building concepts only become truly energy-efficient with monitoring. Reference projects show tremendous deviations between theory and practice. This paper reports on experience at the BOB office complex, including detailed energy measurements and user surveys over a period of ten years.</p> | | |

Session XV:
Tools and applications

Berlin 1 Hall

- 14:30 **Malzer, Harald; Edwards, Dave** 581
designPH - 3D passive house design tool
- The present generation of planners is very familiar with 3D design tools, but unfortunately the issue of energy efficiency plays a minor role in the initial design process and is often taken into consideration too late. This leads to suboptimal details and complex solutions with high end-costs. In order efficiently plan Passive Houses, the PHPP was developed as a detailed high quality tool for thermal calculations. The input of the building's geometrical data, such as surfaces, windows and shading elements, is often challenging and can lead to errors. Therefore, a visual feedback makes the tool more user-friendly and facilitates the control of mistakes. designPH, combines the well-known 3D designing tool SketchUp and the high quality calculation of PHPP. Thus, the issue of energy efficiency comes to the fore, right in the designing stage.
- 14:55 **Dermentzis, Georgios; Ochs, Fabian; Feist, Wolfgang** 587
Heat pumps in Passive Houses - PHPP application
- Heat pumps represent an energy and cost effective solution for buildings in EnerPHit or Passive House standard. The heat pump tool in PHPP gives the opportunity to PH designers to calculate the final electrical consumption of a heat pump easily and accurately.
- 15:20 **Rivero Arias, Maria del Carmen; Steiger, Jan; Theumer, Susanne** 593
Adapting the PHPP to Mexican social housing: the challenges of creating the DEEVi tool
- Based on PHPP, the DEEVI tool was developed by the PHI to evaluate Mexican social housing projects. The fulfilment of the requirements of all involved stakeholders was particularly challenging. The result is a simplified registration and verification tool, adapted to the local specific needs. The process and implementation has been an enriching experience for all involved parties, including the PHI as the developer of the tool.
- 15:45 **Grant, Nick** 599
Internal heat gains
- A simple IHG algorithm is proposed that provides a more realistic approximation of internal gains. Interestingly this makes even very small Passivhaus dwellings possible and greatly reduces the cost of achieving the standard for smaller than average dwellings.

16:10	Arnautu, Dragos PHPP interface certification	605
	Vide Lutman, Marjeta Seismic Foundation Pillow	609
	Oliveira, R.; Alves, A.; Rodrigues, M.F.; Vicente, R. Building with Passivhaus requirements: thermal bridge modelling and thermal influence	611

Session XVI:

Berlin 2 Hall

EnerPHit: Passive House Retrofit

14:30	Bastian, Zeno International EnerPHit-certification criteria PHI's EnerPHit criteria for retrofit with Passive House components have up to now been applicable to locations in cool, temperate climate. The process of developing the upcoming global EnerPHit certification scheme is described and the preliminary certification requirements are specified.	615
14:55	Butcher, Bill; Herring, Chris EnerPHit barn conversion: achieving high thermal performance & structural stability	621
	Sevela, Pavel; Pfluger, Rainer Energy refurbishment of heritage buildings	623
	Bianchi Janetti, Michele; Pfluger, Rainer; Ochs, Fabian Internal insulation applied to a listed school building: in situ measurements and numerical analysis	625
	Hrynyszyn, Bozena Dorota Passive House - an option for a modern rorbu?	627
	Jacobs, Anne; Reuter, Friedrich; Mönning, Sven High performance insulation: technology innovation and tailoring for replication	629
	Egea Barbosa, Marisa; Herrera Estela, Alejandro Passivhaus Refurbishment in Mexico City	631

Plenary session 17:15 - 18:00

Europa Hall

17:15 **Feist, Wolfgang**

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Passive House - the next decade

A new primary energy assessment method is required in order to provide a future-oriented and solid energy efficiency evaluation of buildings, including all mechanical services and electrical devices. This presentation elaborates on a new approach, in which the primary electricity demand of a building is determined under the local climate conditions, assuming an entirely renewable energy supply.