

2016 Conference in Review

27 April 2016

Passive House Conference demonstrates sustainable solutions for new constructions and retrofits

International Conference back in Darmstadt on the anniversary of the building Standard

Darmstadt, Germany. A tried and tested solution is already available for buildings of the future: the Passive House Standard combines maximum efficiency with optimal comfort. How this works, was demonstrated by experts from all over the world on 22 and 23 April during the International Passive House Conference in Darmstadt. This event also marked an anniversary: 25 years ago, the world's first Passive House building was built just a few kilometres away from the congress centre. The sustainability of this concept was substantiated by a new study that was presented at the Conference.

The inhabitants of the first Passive House building in the Darmstadt city district of Kranichstein first moved in in 1991. 25 years of user experiences are available, as well as measurement reports and specific values relating to the durability of the separate systems. Statistical evaluation has shown a stable heating consumption of less than 9 kWh/(m²a) on average – this is less than a tenth of the consumption in conventional residential buildings in Germany. A further airtightness test, thermographic imaging for detecting thermal bridges and sampling the insulation were part of the follow-up investigations. The outcome was clear: "Even today, everything functions exactly as it did the first day. The passive systems are simply less susceptible to faults", says Dr. Wolfgang Feist, Director of the Passive House Institute.

Precisely because this highly efficient building Standard has already delivered first class results for a quarter of a century, at the International Conference one could not only look back at the beginnings, but also set sights to the future. Over a hundred experts presented projects, solutions and approaches which make the building sector sustainable and therefore fit for the future.

Several tens of thousands of buildings throughout the world – whether new constructions or retrofits, detached houses or office towers – have met the criteria of this highly energy-efficient Standard. "What began as an experiment 25 years ago in our city has now become an integral part of international construction activity," said Jochen Partsch, Mayor of Darmstadt. "We are therefore very pleased that in the year of its anniversary the Passive House Conference has returned to the place where this success story originated".



Full plenary session at the International Passive House Conference.



The world's first Passive House building in Darmstadt-Kranichstein.

"The Passive House method of constructing buildings is also an important element for meeting the heating requirements for our buildings completely through renewable sources over the long term. Existing buildings can also be modernised in this way, so that they consume just 25 kilowatt hours per square metre per year", said Mathias Samson, State Secretary in the Hessian Ministry for Economic Affairs, Energy, Transport and Regional Development. "In such cases, the State of Hesse will bear half of the additional costs compared to conventional energy-oriented retrofitting based on the German energy saving ordinance."

"The Passive House is not about building less expensively or more ecologically. It is about building cleverly, planning differently right from the start, for instance without thermal bridges, with a cleverly devised ventilation system, heat recovery, and optimised building technology", said Dr. Heinrich Bottermann, General Secretary of the German environmental foundation DBU. "The Passive House method has positioned itself as a quality criterion, and as a symbol of progress and modernity, and it has now become firmly established as a building standard at the national and international level".

"The Passive House movement was decisive in achieving the majority in the EU for the Nearly Zero-Energy Building", said Claude Turmes, who as a member of the European Parliament is committed to a sustainable energy policy. "The Passive House Institute has done truly pioneering work here." Scott Foster of the United Nations Economic Commission for Europe also commended the significance of the movement for international climate protection

objectives. "The highly efficient Passive House Standard ideally complements the utilisation of renewable energy sources", said the author Dr. Franz Alt, who is one of the pioneers of the German *energiewende*. The former Bundestag member Ernst Ulrich von Weizsäcker who is Co-President of the renowned Club of Rome emphasised in this connection the important role of policy-makers as partners.

In the area of energy efficient building components, a special focus was placed on residential ventilation. In this context the winners of this year's Component Award were also honoured at the Conference. The first prize went to a concept by the Austrian manufacturer Pichler. The joint second prize was given to the Dutch company Vaventis and the Italian firm Michael Tribus Architecture.

The solution provided by J. Pichler GmbH was impressive especially on account of its planning aspects; the device at the centre of the building allows excellent access for maintenance work; in addition, installation is facilitated by prefabricated component solutions such as a combined unit consisting of a silencer, volume flow controller and distribution box. With a very narrow device and easy installation, Vaventis BV achieved a good rating particularly in the category "Suitability for step-by-step retrofitting". In the solution by Tribus Architecture, the duct network was implemented in a very compact manner – positioning of the device near the exterior wall reduces external air and exhaust air ducts to a minimum.

"In order to supply the growing retrofitting market with high quality energy efficient ventilation systems, cost-effective solutions are very much in demand," says Dr. Wolfgang Feist, Director of the Passive House Institute. "The winning concepts demonstrate in an exemplary fashion how this can work". As a key technology, ventilation systems with efficient heat recovery aren't only interesting from the energy-relevant point of view, emphasises Feist. "The filtered and preheated supply air also increases user comfort and reduces indoor air pollution significantly."

Many of the manufacturers who participated in the competition with innovative solutions also presented their products in Darmstadt during the specialists' exhibition. In addition to ventilation units, windows and construction systems, many other types of components which are essential for the construction of a Passive House building were also presented. Passive House residents reported on their experiences in the Passive House Forum for building owners.



Accompanying specialists' exhibition for Passive House components.



Exhibition visitors testing the thermographic imaging camera.

The regional focal points in the experts' presentations were China, North America, and the Mediterranean region among others. Of the approximately one thousand Conference attendees, about 200 visitors came from China. In North America the focus is currently on the construction of the world's first Passive House skyscraper in New York. The first certified Passive House buildings in Greece and Turkey were presented during a lecture session on the Mediterranean climate – several years of experiences already exist with projects in Spain and Italy.

The lecture programme was expanded with numerous workshops and seminars as well as excursions to built Passive Houses in Darmstadt – including a visit to the world's first Passive House building in the city district of Kranichstein. Furthermore, outstanding Passive House projects in Heidelberg, Wiesbaden and Frankfurt am Main were also included in these excursions.

A few days before the Conference, an ice block competition was organised at the Luisenplatz in the centre of Darmstadt. In this live experiment, two "mini-houses" were filled with 300 kilograms of ice. One of these was insulated to the Passive House Standard and had a triple glazed window. The other house only had a conventional insulation thickness and double-glazing. As it turned out, after one week 231.1 kilograms of ice still remained in the "Passive House box", while only 130.6 kilograms of ice remained in the box with less insulation.



Group photo with the Mayor of Darmstadt Jochen Partsch in front of the "mini-house" for the ice block competition.



The Passive House urban settlement Bahnstadt in Heidelberg – one of the destinations of the excursions that took place after the Conference.

Over a third of the total energy consumed in industrialised countries is used for building operation, mainly for heating and cooling. About 85 percent of this energy on average can be saved with the Passive House Standard. Additional investment for a Passive House construction are usually amortised within a few years due to the low running costs. Of course, the heating consumption will remain low even after this time. This principle is therefore extremely attractive for building owners in economic terms.

The International Passive House Conference has been held annually by the Passive House Institute in different cities since 1996. The event took place in Darmstadt again for the first time since the premiere 20 years ago. This year's Conference was organised in cooperation with the City of Darmstadt, the Faculty of Civil Engineering of the Darmstadt University of Applied Sciences, and the University of Innsbruck. The Conference was held under the patronage of Tarek Al-Wazir, the Minister for Economic Affairs of the State of Hesse.



Presentation of the follow-up study for the world's first Passive House building.



Conference visitors at the Passive House Institute's stand.



Presentation and sale of the planning tool PHPP, for the reliable projection of the energy balance of buildings.



Dr. Wolfgang Feist speaking with Prof. Dr. Ernst Ulrich von Weizsäcker and Scott Foster of the UNECE.



The Passive House Forum for building owners in the region.



Models illustrating the Passive House principle.

Further information: www.passivehouse-conference.org