Press Release

05 April 2017

There was great interest in the information event on the energy monitoring of Heidelberg's Bahnstadt. The Passive House city district consumes two thirds less energy than typical complexes.. Photo: Passive House Institute

“Of course we open the windows!”

Passive House monitoring: Bahnstadt as exemplary city district for energy

***Darmstadt/Heidelberg, Germany*. Wolfgang Erichson has been living in the Bahnstadt district of Heidelberg for three years and is very happy with his new place of residence. "It was pleasantly warm even on cold winter days," says Erichson. As a Bahnstadt resident and also mayor of the city, he participated in the information event that was held on the fire station premises where the city administration presented its energy monitoring results together with the Passive House Institute. The two most important outcomes: the consumption of heating energy in the Bahnstadt district was extremely low. Simultaneously, the total energy consumption was only a third of that of conventional housing complexes.**

The Bahnstadt district thus constitutes an excellent example of the successful implementation of the Passive House Standard in a large-scale project. For the energy monitoring of the Bahnstadt district on behalf of the city administration, the Passive House Institute examined the energy consumption of 1400 apartments which included 563 student accommodations. The monthly consumption values for the almost 90 000 m² of usable floor area were available for both the years 2014 and 2015, making this a statistically significant survey.

Statistically significant survey

Søren Peper of the Passive House Institute led the monitoring process and summarises it as follows: "With regard to the total energy consumption, this is just a third of the normal district heating consumption in apartment buildings, which means two thirds less energy costs in the Bahnstadt district."

Despite the ventilation system in each apartment, the electricity consumption in Bahnstadt is well below the average. Photo: Passive House Institute

Low consumption despite ventilation

The monthly data includes the consumption figures for heating energy and hot water, the distribution and storage heat losses and other consumption values including the ramp heating for the underground parking entrance. The monitoring also showed that the buildings in the Bahnstadt district used just one eighth of the heating energy required in an existing building and that they complied with the Passive House Standard. The average heating energy consumption of 14.9 kWh/(m²a) in the year 2014 and 16.4 kWh/(m²a) in the year 2015 constitutes an excellent result. "This is in line with our expectations, which is terrific," explains Peper. He attributes the slight difference between the energy consumption values of the two years to the colder winter as well as the lower global solar radiation between January and March 2015.

"In line with our expectations"

In order to obtain a complete picture of the energy consumption values, the electricity consumption is also of interest besides the heating consumption. The households in the Bahnstadt district have satisfactorily low consumption values compared to the average consumption in Germany, and this is despite the fact that all of these buildings have home ventilation and taking into account the electricity for common use. The average value of the household meters is just 17.9 kWh/(m²a), while that of the electricity meter for common use is 8.6 kWh/(m²a). The Passive House Institute and the city administration of Heidelberg attribute this excellent result mainly to the electricity saving advisory services provided by the city and the modern equipment in the apartments.

Passive House district successful with different designers

"The monitoring shows that the Passive House Planning tool, PHPP, is highly suitable for calculating the actual performance of buildings later on as average values. In addition, the construction of a Passive House district works well even in the case of completely different planning teams and users," explains Professor Dr. Wolfgang Feist. The Director of the Passive House Institute in Darmstadt stresses that the Passive House concept already meets the requirements of the European Union directive for Nearly Zero Energy Buildings, which will be compulsory from 2021.

According to Mayor Erichson, the sale and renting of the houses in the Bahnstadt district has been very good. There are already four kindergartens and a school will be opened this summer. Restaurants and cafes are there as well as a cinema and hardware store. All buildings are built to the energy efficient Passive House Standard. Photo: M. Frelet

Heidelberg entered new territory

The efforts made by the city of Heidelberg to design an entire city district to a high standard in terms of energy efficiency have thus paid off. With the Bahnstadt district, in 2007, the city administration adopted an entirely unique approach to urban planning. It stipulated that all buildings in the 116 hectare area directly next to the central railway station of Heidelberg must be built to the extremely energy efficient Passive House Standard, whether residential or non-residential.

.

"Buildings are easily sold and rented"

Among the non-residential buildings are four kindergartens and a school which will open in the summer of 2017, as well as restaurants and bars, a cinema and a DIY store. The fire station in which the information event organised by the city and the Passive House Institute was held is also a Passive House building. A large shopping centre is under construction, and planning is in progress for a fitness club. Currently about 3500 residents live in the Bahnstadt district of Heidelberg. After completion of all construction projects, there will be about 6000 residents. The city is already planning the third and final construction phase. "We are considerably ahead of schedule because the buildings are easily sold and rented. This has exceeded our expectations," says mayor Erichson.

"Of course we open the windows in our Passive House buildings whenever we want to," so clarified the residents at the information event. They also praise the good quality of indoor air. Photo: Passive House Institute

The fire station in Bahnstadt, with a playground in front, is also built in the Passive House Standard. In 2007, Heidelberg took a new direction and introduced the energy efficient Passive House Standard for all buildings, both residential and non-residential. Photo: Passive House Institute

Praise for good indoor air quality

A survey of the residents showed that most of them are extremely satisfied with their new district near the city centre and with this energy efficient building standard. Together with other residents, Markus Duscha was also available to answer questions during the information event. He clarified: "Of course we open the windows in our Passive House buildings whenever we want to. When the weather is good, we sit outside on the patio." At the same time, he underscores the good quality of the indoor air.

Summer comfort increasingly important in all buildings

As head of the department for climate protection and energy of the Environmental Agency of Heidelberg, Ralf Bermich says: "As far as living comfort is concerned, that's a challenge that we must all address in the future, not only in Passive Houses." The city is already advising of the changing summer condition during its consultation for other upcoming residential projects in the Bahnstadt.

Passive House city districts at the International Passive House Conference

Further Passive House city districts will be presented at the 21st International Passive House Conference. Experts in energy efficient construction will meet in Vienna on 28 and 29 April 2017. The theme of the conference is "Passive House for all". There are also numerous workshops and excursions. Participation in the Passive House Basics Course on 26 April and an excursion to non-residential buildings in Lower Austria on 30 April is free of charge for municipal representatives. Further information is available at www.passivehouseconference.org

The energy monitoring report on Bahnstadt Heidelberg can be found here:

☝ http://passiv.de/downloads/05_heidelberg_bahnstadt_monitoring_report_en.pdf

General information

Passive House
A Passive House is a building that does not require any conventional building heating on account of its excellent thermal insulation. Such buildings are called "passive houses" because a major part of their heating demand is met through "passive" sources such as solar radiation or the waste heat from occupants and technical appliances. A Passive House thus consumes about 90 percent less heating energy than existing buildings and 75 percent less energy than an average new construction.

Passive House & COP22 in Marrakesh 2016
The United Nations Environment Program (UNEP) explicitly mentions Passive Houses as a key possibility to increase the energy efficiency of buildings and thus reduce global warming,
=> see "The Emissions Gap Report 2016", pages 32 + 35.
https://uneplive.unep.org/media/docs/theme/13/Emissions_Gap_Report_2016.pdf

Pioneer Project
The first Passive House in the world was built in Darmstadt-Kranichstein (Germany) 25 years ago by four private homeowners on their own personal initiative. Ever since the homeowners moved in with their families in 1991, these terraced houses have been regarded as a pioneer project for the Passive House Standard. 25 years later, building physicists have attested to the unimpaired functioning of the first Passive House and its unchanged low heating energy consumption. With its newly installed photovoltaic system, the world's first Passive House now utilises renewable energy and received the Passive House Plus certificate for this reason.

Passive House and renewable energy
The Passive House Standard can be combined well with on-site renewable energy generation. Since April 2015, the new building classes "Passive House Plus" and "Passive House Premium" have been available for this supply concept. The first buildings to be certified in these two categories include both private houses and office buildings.

Passive Houses worldwide
Passive Houses buildings for all types of uses now exist everywhere. In addition to residential and office buildings there are also kindergartens and schools, sports halls, swimming pools and factories built as Passive House buildings. The first Passive House hospital in the world is currently being built in Frankfurt am Main. Interest in Passive House is growing. In view of the consumption of resources in industrialised countries and the need to contain global warming, municipalities, businesses and private people are increasingly implementing new constructions or retrofits to the Passive House Standard.

Passive House Institute
The Passive House Institute with its headquarters in Darmstadt (Germany) is an independent research institute for highly efficient use of energy in buildings. Under the leadership of Prof. Dr. Wolfgang Feist, the Institute holds a leading position internationally with regard to research and development in the field of energy efficient construction. The Passive House Institute is the organiser of the International Passive House Conference and the accompanying specialists' exhibition.

Pictures for editorial purposes: www.flickr.com/photos/passive-house-institute
We gladly provide pictures via e-mail upon request.

To get the latest news relating to Passive House, visit: www.twitter.com/the_iPHA

Press contact:
Katrin Krämer, Press officer
Passive House Institute Dr. Wolfgang Feist I Rheinstr. 44/46 I D- 64238 Darmstadt
Telephone: +49 (0) 6151/82699-0 I E-mail:presse@passiv.de I