



Passive House has its 30th anniversary, the Passive House Institute is now 25 years old, and the International Passive House Conference is taking place for the 25th time, this year in September in Wuppertal, Germany. © Pixabay

Happy Birthday, Passive House!

Passive House now 30 years old – pioneering work paves the way for energy efficiency



Celebrating its 30th birthday: the world's first Passive House building in Darmstadt. This pilot project received a photovoltaics system in 2015, resulting in certification as a Passive House Plus. © Peter Cook

Darmstadt, Germany. Passive House is celebrating its 30th birthday this year! Starting as an experiment, great credit can be given to this pioneering project by Professor Wolfgang Feist: at a time when only very few people thought about climate protection, it paved the way for energy efficiency in buildings. Today, the Passive House Standard has been implemented throughout the world and shines particularly brightly in beacon projects globally. More reasons for celebrating: the 25th anniversary of the Passive House Institute and the jubilee edition of the International Passive House Conference.

"Of course, I'm happy about this development: seeing the progress from the first experimental residential building to the projects and districts worldwide designed to the Passive House standard", explains Passive House pioneer Professor Wolfgang Feist. Nevertheless, he makes it clear that "without significantly greater commitment on the part of the governments, there will be very little progress in energy efficient construction of buildings." The physicist has demonstrated a practicable solution for a high level of energy efficiency by constructing the first Passive House building.

Climate protection is a priority

In the seventies, explains Feist in an **interview**, it was already clear that fossil based energy sources are limited. The production and utilisation of these sources also leads to extremely high CO₂ emissions. Together with the Swedish engineer Bo Adamson, he looked for implementing buildings without a traditional heating system even in colder climates. The motivation: climate protection.

Stopping heat losses

It was clear that, in order to keep buildings warm by passive measures, the typical but unnecessary heat losses had to be reduced: among other things, by means of excellent insulation of the walls, of the roof as well as on the ground while adding another, third pane of glass to the windows. In addition, if the building was constructed in an almost airtight manner and if thermal bridges were avoided, the indoor space with support of passive measures like solar radiation would automatically stay pleasantly warm for a long period of time. In summer, Passive House buildings are pleasantly cool.

Ridiculed by many

Finally, Professor Wolfgang Feist defined specific values for better construction: the Passive House standard was the outcome. He also specified that it should be freely available to everyone who was interested. The Feist family built the Passive House pilot project in partnership with three other families - as a complex consisting of four identically built terraced houses. The research project was funded by the German federal state of Hesse. The project was initially ridiculed by many, though.

Research from day one

In the autumn of 1990, diggers rolled into action on a building site that had been allocated for "experimental construction" by the city of Darmstadt. In spring 1991, exactly 30 years ago, the homeowners celebrated the topping out ceremony together with the general public. In the autumn of 1991 they moved into their new homes. From day one intensive research has taken place in the first Passive House building, currently a monitoring project by the International Energy Agency (IEA) is in progress.



Professor Feist built the world's first Passive House building together with his family. He thus paved the way for efficient climate protection in the building sector. © Peter Cook



Beacon projects: the first certified hospital built to the Passive House standard is currently under construction in Frankfurt am Main, Germany (left). A lot of energy can also be saved in indoor swimming pools and retail stores. Municipalities and businesses are increasingly following the example set by the "Bambados" swimming pool in Bamberg, Germany, (centre) and the supermarkets belonging to MPREIS in Austria (right). © Passive House Institute (l & c); MPREIS, Lukas Schaller (r)

Social equality

30 years after the completion of the first Passive House building, schools, kindergartens, sports halls, supermarkets, museums, hotels and entire districts built to the Passive House standard are now self-evident. It is now very well known that Passive House buildings require very little energy for heating and cooling. This makes them an important prerequisite for effective climate protection,



Wolfgang Feist 1991 in front of the world's first Passive House building (l.) and with his wife Witta Ebel (r.). The German federal state of Hesse funded the research project. © Private; P. Cook

as well as for social equality. The high standard of living comfort is a big plus. More cities and countries are consistently stipulating energy efficiency to the Passive House standard in their building regulations (**Passive House resolutions**).

Energy efficiency is imperative

In view of the climate crisis, it is clear that it is *imperative* to build in an energy efficient way. Just recently, the German Federal Constitutional Court ruled that the German climate protection law is unconstitutional in parts. According to the ruling, the government must clarify the rules as to how emissions are to be effectively reduced after 2030.

Approaching tipping points

Energy efficient buildings are fundamentally important for extensive coverage with renewable energy and are thus an essential part of the solution. "There's no going back if the tipping point is reached, and no vaccination that can stop the horror. We must take action *now*, in order to keep life on our planet worth living. The building sector must make a larger contribution. Many national construction standards still permit energy consumption that is much too high", warns Feist.

Passive House Institute 25 years old

Manufacturers and craftsmen have also recognised the opportunities presented by energy efficient constructions and retrofits. The **Component Database** of the Passive House Institute now includes over 1200 certified building components. The Technical University in Innsbruck, Austria, recognised the importance of this topic for academic and training education very early on. Building physicist Wolfgang Feist taught energy efficient construction for over ten years there. The number of experts is thus increasing, and many of them come together each year at the **International Passive House Conference**, which is celebrating its 25th jubilee this year. Just before the first International Passive House Conference in 1996, Wolfgang Feist founded the Passive House Institute, which is also celebrating its 25th anniversary and thus offers another reason to celebrate. *(A detailed press release with further interesting pictures can be found [here](#))*



All built to the Passive House standard: new business premises of the Spanish shoe manufacturer Victoria (left). Energy efficiency is fundamental for affordable living and social housing: Kufstein houses of the Austrian housing developers Neue Heimat Tirol (centre). In the Canadian town of Alberta, a car dealership celebrated its 50th anniversary by treating itself to a new energy efficient showroom and workshop (right). © Victoria (l.), Neue Heimat Tirol (m.), G. Scott (r.)



General information

International Passive House Conference

The 25th International Passive House Conference will take place in September 2021 as a hybrid event, in the Historic Town Hall in Wuppertal (Germany) as well as online. www.passivehouse-conference.org

Passive House buildings

With the Passive House concept the heat loss that typically takes place in buildings through the walls, roof and windows is drastically reduced due to high-quality thermal insulation, windows with triple glazing, an airtight building envelope, and a ventilation system with heat recovery among other things. The five basic principles altogether ensure that Passive House buildings can manage without *classic* building heating systems. 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 heat emitted by occupants and technical appliances.

Since the heat is retained for a long time in a Passive House building, active heating is needed only during extremely cold days. A very small amount of energy is required in total for providing this remaining heating. A Passive House building also offers an advantage in the summer: the excellent level of insulation ensures that the heat stays outside, therefore active cooling usually isn't necessary in residential buildings. Due to the low energy costs in Passive House buildings, the utility costs are predictable - a fundamental principle for affordable homes and social housing. A Passive House building thus consumes about 90 percent less heating energy than an existing building and 75 percent less energy than an average new construction.

Passive House & NZEB

The Passive House Standard already meets the EU requirements for Nearly Zero Energy Buildings. According to the European Buildings Directive *EPBD*, all member states must specify requirements for so-called NZEBs in their national building regulations. These came into effect in 2021 for all buildings.

Pioneer project

The first Passive House in the world was built in Darmstadt, Germany, 30 years ago by four private homeowners. Prof Wolfgang Feist was one of them. 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. With its newly installed photovoltaic system, this flagship 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.

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, Germany. In view of climate protection and the consumption of resources in industrialised countries, 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. The Institute founded by Prof Wolfgang Feist holds a leading position internationally with regard to research and development in the field of energy efficient construction. Among other things, Prof Wolfgang Feist was awarded the DBU Environmental Prize in 2001 for developing the Passive House concept.

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