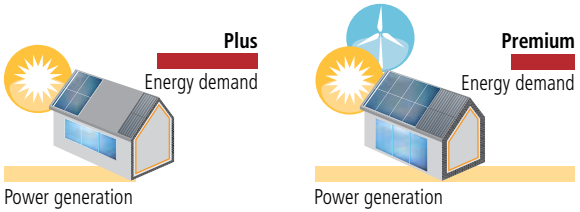

EnerPHit retrofit in New York | Fete Nature Architecture | Photo © Hai Zhang


Single family home in Denmark | olav langenkamp, architekt eth-maa | Photo © langenkamp.dk

## Passive House – Sustainability

The energy efficiency of Passive House is perfectly complemented by renewable energy. The minimal energy consumption means Passive House buildings can be supplied entirely by renewable energy sources. To make this possible, the Passive House Institute has developed an innovative planning method for optimising buildings for the use of renewable energy sources. Depending on the energy output, buildings can be certified as a Passive House Plus or Premium. With many professionals now certified as Passive House Designers and/or Tradespeople, Passive House buildings are even more economical. Even without financial support, Passive House buildings are **more cost-effective** in their life-cycles than conventional buildings.




## Passive House – Efficient retrofit

The use of Passive House components in the retrofit of existing buildings is well-established. It is best to begin the retrofit by replacing the building component that is most in need of replacement. An individualised, comprehensive plan can ensure that the new measures fit together. Step-by-step, a plan leads to a comfortable building, built to the highest standard with improved insulation and significantly reduced heating costs.

**Step-by-step to EnerPhit –
the Passive House Standard for retrofits.**

## Passive House – Reliability

**Passive House buildings must be carefully planned and constructed. Only then can the energy goals of Passive House be achieved. To meet these goals, the Passive House Institute has developed its most important planning tool: the Passive House Planning Package, which is complemented by the 3D-Tool designPH. Quality assurance is also offered by the Passive House Institute, which assesses buildings, building components as well as professionals.**

## iPHA

### The International Passive House Association

Founded by the Passive House Institute to connect Passive House stakeholders worldwide, iPHA harnesses international interest in Passive House to advance the Standard globally. iPHA makes a wealth of Passive House knowledge accessible through channels such as Passipedia, the Passive House resource – a constantly growing body of specialised Passive House knowledge. iPHA communicates with the media, the general public and construction professionals, facilitating active exchange amongst stakeholders.

**Passive House Institute**
www.passivehouse.com

**International Passive House Association**
www.passivehouse-international.org

**Passipedia**
www.passipedia.org

**Certified Passive House Designer**
www.passivehouse-designer.org

**Certified Passive House Tradesperson**
www.passivehouse-trades.org

**passivehouse-international.org**

comfortable
affordable
sustainable

# Passive House

Passive House Institute

International PASSIVE HOUSE Association iPHA


Single family home in Italy | Michael Tribus Architecture | Photo © Michael Tribus


Semi-detached family house in Spain | Photo and Architecture © DUQUEYZAMORA ARQUITECTOS


Passive House in Japan | Photo and Architecture © KEY ARCHITECTS

## Passive House buildings – Optimisation

Passive House buildings are built according to the laws of physics to find the most economically optimal and technically feasible design. Although the cost of a Passive House building can be slightly higher than a regular build, the building envelope alone is worth the investment. A Passive House building returns on the investment with its exceptionally low heating costs after just a few short years, putting the occupants at a clear advantage. Passive House buildings are able to achieve this by concentrating on the improved quality of all building components and techniques used in their construction. Better windows, high-quality insulation as well as an efficient ventilation system with heat recovery all optimise Passive House building construction.

Passive House is neither a specific building construction nor design. Instead, Passive House buildings can be designed by any experienced architect using a solid, wood or mixed construction. Existing buildings can also be retrofitted to the Passive House Standard, as the five key principles are universal.

**Five principles are key to the Passive House concept:**

**1. Insulation**
A well-insulated building envelope keeps warmth in during the cold months and heat out during warmer months.

**2. Passive House windows**
Strategically positioned, highly insulated windows do their part to make optimal use of the sun's energy. (Central European climates typically require triple-paned, noble gas filled, low-e glazing; in both more extreme and milder climates these requirements will vary accordingly.)

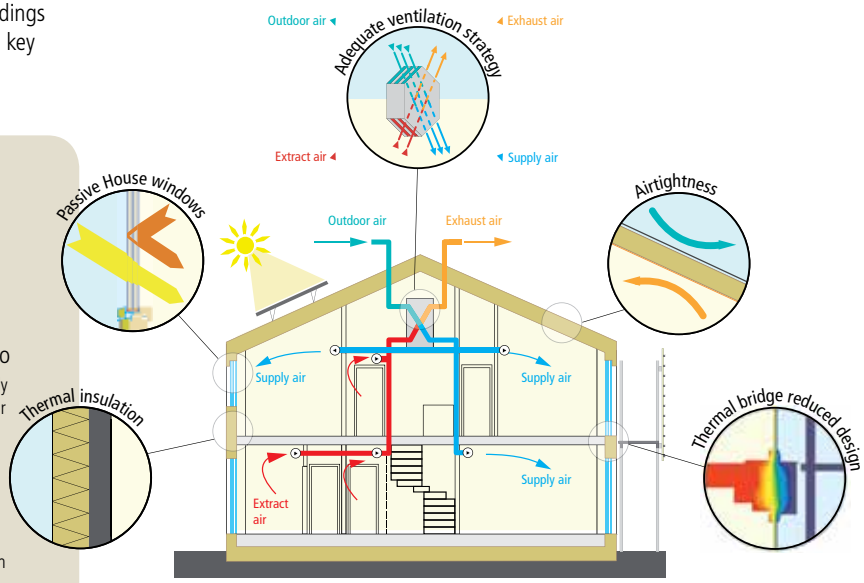
**3. Ventilation with heat recovery**
Passive House ventilation systems provide plentiful fresh, pollen and dust-free air with maximal energy efficiency through heat recovery. (Warm, humid climates may also benefit from an extra dehumidification system or energy recovery)

## What is a Passive House?

**A Passive House is a highly energy efficient building, which requires minimal heat energy to maintain a comfortable interior temperature. To achieve this, Passive House buildings use predominantly passive heat sources such as the sun's rays, the occupant's body warmth and the heat coming off technical devices. Thanks to the quality insulation and efficient ventilation system, Passive House buildings remain warm on cold days and comfortable and cool on warmer days.**

## Five key principles

## www.passivehouse.com




## Passive House – Comfort

Excellent insulation, triple-glazed windows as well as comfort ventilation make Passive House buildings comfortable living and working spaces. Every room maintains the same temperature, with ventilation to provide fresh air. All this can be achieved with very low heating costs, as Passive House buildings use around 90% less heating energy than regular buildings. Even when compared to low energy houses which meet the minimum legal requirements, Passive House buildings save around 75% or more heating energy. The quality of construction protects the structure and maintains the value of the property long-term.

**And of course you can open the windows!**

## Passive House – Tried and tested

The first Passive House building was completed in 1991 in Darmstadt, Germany. Since then, the Passive House principal has proven itself thousandfold. There are now over 30,000 Passive House certified housing units covering a surface area of 2,900,000m² (stand 06|2021) – proving that the Passive House Standard can be implemented in a wide range of countries and climates. A selection of quality-tested examples of Passive House buildings is available on the Passive House database, which documents over 5,100 Passive House projects:

**www.passivhausprojekte.de/index.php?lang=en**

**4. Airtightness**
Passive Houses are designed to avoid leakages in the building envelope, thus boosting energy efficiency while preventing draughts and moisture damage.

**5. Thermal bridge free design**
Avoiding thermal bridges, which are weak points in the building envelope, contributes to pleasant, even interior temperatures while eliminating moisture damage and improving energy efficiency.