



Single-family house | Photo: G. Vallentin



Single-family house | Photo: M. Wamsler



Office building | Photo: W. Friedl



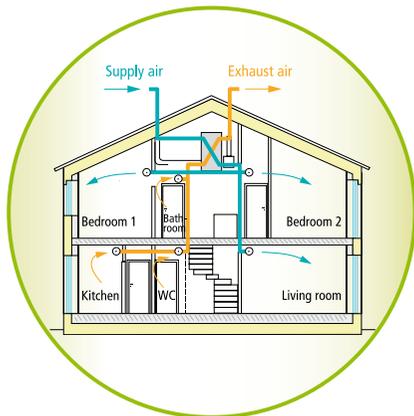
Kindergarten | Photo: M. Wamsler



## The Passive House Sustainable affordability

Passive Houses do not require conventional heating or cooling units, meaning that investment can instead be channelled toward higher quality components. This, in addition to vast, **long-term energy** savings makes Passive House an excellent investment. Especially in the face of dwindling energy resources and rising energy costs, the Passive House Standard exemplifies sustainable affordability.

Even so, Passive Houses may cost slightly more upfront than their conventional counterparts, yet this is changing as Passive House suitable components become increasingly available on markets worldwide. The growing number of professionals with Passive House experience, many having earned the international Certified Passive House Designer or Tradesperson qualification, is also contributing to Passive House affordability. Financial support for Passive Houses, already available in a number of countries, further reduces their cost. Even without such financial support, Passive Houses are **more cost-effective** over their life-cycles than their conventional counterparts.



Title pictures: row of terraced houses | Photo: Casa Nova, "living in the Passive House"  
Photo: Bettina Glaser | Graphic design: M. Blücher, Passive House Institute | © PHI

## The Passive House Quality assurance

In addition to cutting edge research and Passive House component certification, the Passive House Institute and its network of Accredited Building Certifiers offer quality assurance for Passive House buildings. You can be sure that buildings having attained the Certified Passive House designation as well as retrofits certified according to EnerPHit Standards for energy efficient renovations have met stringent criteria laid out by the Passive House Institute.

### 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 accessible a wealth of Passive House knowledge 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 the entire range of construction professionals, facilitating active exchange amongst stakeholders.

**Passive House Institute**  
[www.passivehouse.com](http://www.passivehouse.com)



**International Passive House Association**  
[www.passivehouse-international.org](http://www.passivehouse-international.org)



  
**Passipedia**  
[www.passipedia.org](http://www.passipedia.org)

  
**Certified Passive House Designer**  
[www.passivehouse-designer.org](http://www.passivehouse-designer.org)

  
**Certified Passive House Tradesperson**  
[www.passivehouse-trades.org](http://www.passivehouse-trades.org)

# The Passive House

comfortable, affordable, sustainable





Retrofit | Photo: PHI



Single-family house | Photo: T. Weber



Single-family house | Photo: Birgit Madreiter



Living room | Photo: M. Wamsler



Single-family house | Photo: G. Limberger



Gymnasium | Photo: PHI

## The Passive House Efficiency at its best

No matter the climate or region, Passive Houses stay at a comfortable temperature year round with minimal energy inputs. Such buildings are heated passively: they make efficient use of the sun, internal heat sources and heat recovery, rendering conventional heating systems unnecessary throughout even the coldest of winters.

During warmer months, Passive Houses make use of passive cooling techniques such as strategic shading to keep comfortably cool. Either way, superior components combined with careful planning ensure that temperatures remain constant and comfortable year round.

### ○ Sustainability

A Passive House uses up to 90% less energy than typical Central European buildings, requiring less than 1.5 litres of oil or 1.5 cubic meters of gas to heat one square meter of living space for an entire year. Vast energy savings have also been demonstrated in warm climates where buildings typically require active cooling. As reductions in energy use lead to reductions in greenhouse gas emissions, Passive House is a truly sustainable alternative to conventional construction.

### ○ Affordability

As seen from the entire building lifecycle – the only sensible way to determine the real costs of a building, Passive Houses save money. They are also surprisingly affordable to build. The investment in higher quality building components required by the Passive House Standard is mitigated by the elimination of expensive heating and cooling systems. Increasingly available financial support makes building a Passive House all the more feasible.

### ○ Comfort

Passive Houses pair pleasant temperatures with extremely low energy use. Their ventilation systems consistently and imperceptibly supply the fresh air needed, making for superior indoor air quality. The mix of consistent temperatures and appropriate air exchange prevents both moisture damage and mould growth.

## The Passive House Five key principles

A Passive House building acts much like an insulated flask, which passively keeps its contents at the right temperature without the need for active cooling or heating.



### 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<sup>1)</sup> do their part to make optimal use of the sun's energy.

#### 3. Ventilation with heat recovery

Passive House ventilation systems provide plentiful fresh, pollen and dust-free air with maximal energy efficiency through heat recovery.<sup>2)</sup>

#### 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

Avoidance of thermal bridges, weak points in the building envelope, contributes to pleasant, even temperatures while eliminating moisture damage and improving energy efficiency.

<sup>1)</sup> 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.

<sup>2)</sup> Warm, humid climates may also benefit from an extra dehumidification system or energy recovery

[www.passivehouse.com](http://www.passivehouse.com)

## The Passive House Versatility

The Passive House Standard is a purely performance-based, quality standard and thus dictates no particular methods of construction.

Whether solid construction, wood or composite – architects are free to be creative with their Passive House designs. Even manufacturers of prefabricated houses are offering Passive House buildings. The versatile Passive House Standard is also increasingly being used in retrofits in the form of the EnerPHit Standard as well as for non-residential buildings such as schools, administrative buildings, manufacturing plants and hotels. As Passive House is based on physical principles, each building can and should be adapted to its particular climate.



Over the last two decades, the Passive House Standard has gained rapidly in popularity. Over 37,000\* Passive Houses have been built worldwide in an ever increasing range of climates and many of these have been certified according to strict Passive House Institute criteria. These numbers are on the rise not only due to the outstanding advantages Passive House offers, but also due to its flexibility.

\* figures as of early 2012