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Cover photo: Nieuw Zuid development in Antwerpen | Belgium © Studio Associato Secchi-Viganò

## Opportunities and benefits

The widespread uptake of Passive House as a means of delivering nearly zero energy buildings across Europe will inevitably lead to an increased demand in suitable products. Passive House calls for high levels of thermal performance in the building fabric as well as highly efficient building services. Many of the required products are not yet common in mainstream construction, yet they will need to be available at an acceptable cost in order to allow NZEBs to be delivered affordably.

The Passive House approach is flexible enough to accommodate the entire range of construction methodologies and designs, whilst delivering cutting edge environmental performance across buildings of various uses and scale. There is thus great potential for manufacturers of building products to adapt and diversify their offerings with vast opportunities to expand into new markets. Such manufacturers play a critical role in the successful EU-wide delivery of nearly zero energy buildings on the basis of Passive House supplied by renewables.

Custom Precision Joinery recognised that there were no local suppliers of Passive House Certified triple glazed windows in Wales or the surrounding regions. Understanding that customers would be reluctant to import products from outside the UK, they developed a solution that could be manufactured locally at a competitive price.



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## Taking advantage

Over their life cycles, improved products pay for themselves through the radically lowered energy costs and higher levels of comfort to which they contribute. The need for such high performance products offers European manufacturers of building products a profitable opportunity to take part in the energy revolution.

Raising awareness amongst designers and clients as well as exchange with other experts will be key to delivering needed products. Manufacturers can take advantage of PassREG supported events such as the International Passive House Component exhibition and manufacturers exchange as well as the wide variety of events held locally throughout the participating regions. PassREG also supports manufacturers in achieving Passive House Institute product certification to validate performance. This drives the availability of suitable products critical to wider EU uptake while offering enhanced market opportunities and recognition to manufacturers who demonstrate performance in line with Passive House criteria.

Passive House ventilation systems use highly efficient heat exchangers to recover the heat from used, outgoing air. State-of-the-art technologies allow for heat recovery rates of 90% or more. Such systems supply ample fresh air as needed for good indoor air quality and offer an efficient way to achieve comfortable room temperatures year round.



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PassREG

# Building for the energy revolution

Passive House Regions with Renewable Energies



An informational pamphlet for:  
manufacturers of building components

## Passive House regions

Meeting our energy needs sustainably into the future requires nothing short of an energy revolution. In terms of our built environment, perhaps the greatest opportunity lies in the promotion of an “energy efficiency first” approach to building, supplemented by renewable energies. Several front runner regions across the EU already successfully support this approach on the basis of the Passive House Standard. Many more aspire to get on board.

By investigating what makes front runner regions so successful as well as by making their successes more accessible, the PassREg project helps aspiring regions become front runners themselves. In the examination of both regional mechanisms and individual construction case studies, a wealth of knowledge will be gleaned to support actors in optimising existing models promoting energy conscious construction and inspiring new ones.

### Participating regions

<b>Austria</b>	The Region of Tyrol
<b>Belgium</b>	The Brussels Capital Region and the City of Antwerp
<b>Bulgaria</b>	The Municipalities of Burgas and of Gabrovo
<b>Croatia</b>	The City of Zagreb
<b>France</b>	The Region of Aquitaine
<b>Germany</b>	The Cities of Frankfurt am Main, of Hanover, and of Heidelberg
<b>Italy</b>	The City of Cesena; the Provinces of Foggia, and of Pesaro and Urbino; the Government of Sicily and the Province of Catania; the Municipality of Lonato and the Province of Lombardia; the Municipality of Aglientu (Sardinia) and of San Giovanni Lupatoto (Verona)
<b>Latvia</b>	The Regions of Latgale and of Vidzeme
<b>Netherlands</b>	The Region of Arnhem-Nijmegen
<b>United Kingdom</b>	The City of Carmarthenshire (Wales)

## Toward EU energy goals

The EU has set ambitious goals for energy performance in buildings. To meet these goals by the 2020 deadline, many are looking to the Passive House Standard for energy performance in buildings.

### Passive House is the basis

An internationally recognised building energy standard, Passive House combines maximal comfort with minimal energy use and life cycle costs. Through a focus on careful planning paired with quality building components, Passive House buildings use an average of 90% less energy than typical building stock – in terms of heating, they require less than 1.5 cubic metres of gas or 1.5 litres of oil per square meter annually. Vast energy savings have also been demonstrated in warm climates where conventional buildings typically require active cooling.

### Making renewables feasible

The high levels of energy efficiency reached by Passive House buildings mean that the tiny energy demand that remains can be covered, economically, by a wide variety of renewable energy sources. Such efficient buildings can also do more with the renewables placed on small surface areas – a critical aspect in urban areas where buildings often have restricted roof and facade areas.

Many Passive House buildings make use of renewable energies, e.g. through photovoltaic systems, to cover their remaining energy demand.



## Quality assurance

Buildings, whether new build or retrofit, must perform as expected if we are to ensure sustainable energy supply into the future and improve our standard of living in so doing. Proper performance, in turn, can only be ensured if quality in design, construction and the materials chosen is taken seriously.

PassREg builds upon existing Passive House design tools as well as quality assurance procedures and certification criteria for both buildings and components. Through PassREg, these criteria are being optimised for application throughout the EU, guided in part by the monitoring results of select case studies. In addition, PassREg strengthens the appropriate quality assurance infrastructure in partner countries while driving increased availability of qualified materials and products on regional markets.



The energy balance and Passive House design tool known as the PHPP or Passive House Planning Package is perhaps the most accurate energy balance program on the market. It stands as the first step in quality planning for low energy buildings.



The Passive House Institute certifies building components in order to provide quality assurance for high performance, Passive House suitable products and make such products visible on the market. This is an example of the seal awarded to transparent components meeting Passive House criteria.



Buildings meeting Passive House energy efficiency criteria can be certified according to international Passive House criteria. For energy retrofits in which the Passive House requirements cannot be met, EnerPHit certification may be awarded. These certifications stand for quality in high performance construction.

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## Training and qualification

Qualified architects, engineers and craftspeople are essential in the successful construction of high performance buildings. Such professionals form the basis of the successes seen in front runner regions having successfully implemented Passive House solutions supplemented with renewables on large scales. Indeed, one of the greatest challenges faced in this regard lies not in technical details but in the training of qualified professionals.

Through PassREg, aspiring regions are being supported in the development of long term training strategies based on the successes of front runners. Courses making use of and building on readily available material for designers and tradespeople are being translated and adapted as needed to fit regional requirements. These offerings, supplemented by a range of informational sessions and forums, will serve as the basis for the general uptake of Passive House training by educational systems as well as by the building sector throughout the EU.

Architects and craftspeople in a Brussels Passive House course are working with a 3D model to get familiar with typical features of Passive House buildings such as suitable connections between a solid wall, concrete floor slab and foundation wall. These participants are learning how to apply PU panels to the exterior wall and how to achieve a continuous, uninterrupted insulation layer between the floor (inside) and the wall (outside).

