

Press Release

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# Energy efficiency: clear winner

In Glasgow Scottish code box struggles in heat - Passive House box retains plenty of ice

**Darmstadt, Germany/Glasgow, Great Britain.** The staggering result of the Glasgow Ice Box Challenge was visible just by looking inside the two boxes: There was no ice left in the box built to the Scottish building standard for five days prior to the final weigh in, while two big blocks remained in the Passive House box.



Dog Nessi is enjoying the refreshment: There were more than 120 kilograms of ice left in the box built to the Passive House standard while all the ice in the Scottish code box had melted after eleven days.

© Passivhaus Trust, Kirsten Priebe.

Two weeks before, each of the boxes had been filled with 917 kg of ice to demonstrate the benefits of better building. The result: While all the ice had melted in the Scottish code box after eleven days, 121 kilograms of ice remained in the Passive House box.

In the run-up to the United Nations' climate summit this November, the City of Glasgow this summer hosted the Ice Box Challenge. The objective: to demonstrate the advantages of highly energy-efficient

buildings to the wider public in an accessible manner. Over the course of two weeks, the two ice boxes, which were installed in the city centre, attracted the interest of many passers-by.

## Visible results

The result after two weeks of unusually warm weather in Scotland was clear: There was no ice left in the box built to the Scottish standard. The weigh in revealed that the Passive House box has retained 121kg - without active cooling. Andrew Workman from Scotland made the closest guess to the final result by predicting that the Scottish box would have zero ice remaining: "I picked 120 kg for the efficient Passive House as I thought there would be about ten percent remaining, and I added a little for buffer. I am really surprised that I won, especially considering the Glasgow heatwave". Workman won a weekend in a Passive House B&B in Worcestershire, Great Britain.



Passers-by check the amount of ice left in the green Passive House box in the city of Glasgow © Passive House Institute

## Looks can deceive

“The Ice Box Challenge is a fantastic and fun way to illustrate the system in action”, says Ruairi Kelly from the Glasgow City Council. The result in Glasgow vividly demonstrates the advantages of better buildings. The two boxes looked the same from the outside, save for the red and green herringbone pattern. Internally, the window glazing, insulation levels, airtightness and reduced thermal bridges made all the difference. These four out of five indispensable principles for **Passive**



The team of the Ice Box Challenge in Glasgow in front of the Passive House box at the weigh in and closing ceremony. Glasgow will also host the COP26 in November this year. © Passivhaus Trust, Kirsten Priebe

**House buildings** contribute to keeping the heat out in summer. Especially this summer, when Glasgow experienced a heat wave, the results demonstrate how the Passive House standard provides cooler and more comfortable indoor temperatures in future-proof buildings.

## Glasgow hosts COP 26

In winter, the same Passive House characteristics keep the warmth inside the house. Together with the fifth principle, a ventilation system with heat

recovery, Passive House buildings provide a high level of comfortable and healthy living. The Glasgow City Council and local housing associations have increasingly implemented the Passive House standard into new build and retrofit projects. Michelle Mundie from the Housing Investment Group at Glasgow City Council: “Housing associations in Glasgow are looking at this very closely and what it means to new build programmes. For tenants it means more comfortable homes with lower running costs”. Glasgow is also the host for COP26 this November where the Ice Box Challenge will be for display.

## Climate protection

Currently, almost 35 percent of global energy consumption comes from the building sector alone. Energy used to operate buildings, predominantly for heating and cooling, is one of the largest contributors to carbon emissions within the built environment. Better building design helps to reduce their carbon footprint since highly energy-efficient buildings need substantially less energy for heating and cooling. With this drastically reduced demand for energy, Passive House buildings are pivotal to climate protection.

## Joint effort

“Buildings that prioritise efficiency are comfortable and healthy while also providing a pathway to a fully renewable future and jobs”, says Giorgia Tzar from the International Passive House Association (iPHA). The Ice Box Challenge in Glasgow was a joint effort from iPHA, Glasgow City Council, Passive House Institute, Edinburgh Napier University, Passivhaus Trust and Construction Scotland Innovation Centre. It enjoyed the patronage of the UN’s Economic Commission for Europe (UNECE) and Global Alliance for Buildings and Construction. The challenge was also part of the iPHA campaign “Efficiency: The First Renewable Energy”.

### Event organisers



### Under the patronage of



### With kind support from



## #EfficiencyFirst

The 2021 campaign, #EfficiencyFirst, emphasises the foundational role efficiency plays in any building project: operating emissions over the building's lifecycle threaten to overwhelm all other upfront carbon emission savings. Equally, converting to an all-renewable energy future will not be possible without drastically reducing the buildings' energy demand. Therefore, it is crucial to efficient climate protection to reduce energy consumption within the building sector at scale.

For more information, visit [www.IceBoxChallenge.org](http://www.IceBoxChallenge.org)



## General information

### International Passive House Conference

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

Active heating is needed only during extremely cold days. And only a very small amount of energy is required. 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 low utility costs are predictable - a fundamental principle for affordable homes and social housing.

### 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.



The world's first Passive House building in Darmstadt. © Peter Cook

### 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.

### 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. Prof Wolfgang Feist was awarded the DBU Environmental Prize in 2001 for developing the Passive House concept.



Prof Wolfgang Feist. © Peter Cook

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