Press Release **16 July 2021**

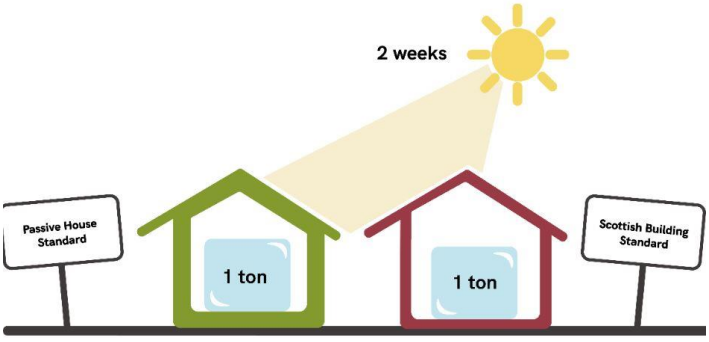
The Scottish city of Glasgow will host the Ice Box Challenge this summer to show the benefits of highly energy efficient buildings. They keep warm in winter and cool in summer. The challenge starts on 23 July 2021. © City of Glasgow

Keeping cool in Glasgow this summer

Ice Box Challenge: Passive House will show benefits of energy efficient buildings

Darmstadt, Germany. **The Scottish city of Glasgow is preparing for the United Nations' climate summit at the end of this year. This summer, the city will host the Ice Box Challenge to demonstrate the advantages of highly energy efficient buildings like Passive Houses: they save substantial amounts of energy and offer a high level of living comfort in summer and winter. The event offers visitors the opportunity to learn more about energy efficient buildings and to take part in a contest.**

Currently, almost 35 % of global energy consumption comes from the building sector alone. Energy used to operate buildings, predominantly for heating and cooling, is one of the biggest contributors to carbon emissions within the built environment. Better building design helps to reduce their carbon footprint. The Ice Box Challenge is a scientific demonstration of the benefits of energy efficient buildings. For two weeks, one ton of ice will be exposed to summer temperatures in a box built to the Scottish Building standard, the other ton in a box built to the highly energy efficient Passive House standard.



A ton of ice will be exposed to summer temperatures in two different small-scale buildings. The Ice Box Challenge in Glasgow demonstrates how highly energy-efficient buildings maintain comfortable temperatures also in summer times. © Glasgow Ice Box Challenge

Experiment and contest

The two boxes are located in the city centre of Glasgow. The challenge is a public experiment and contest to demonstrate how a highly energy efficient building maintains comfortable temperatures, also in summer. As previously demonstrated in Ice Box Challenges around the globe, the ice block in the Passive House box in Glasgow is also expected to last a lot longer during the heat due to cooler, more pleasant temperatures within the box. Highly energy efficient Passive House buildings need substantially less or even no active cooling in summer and very little active heating in winter. This drastically reduced energy demand is pivotal to global climate protection.

Production of the Passive House ice box: The design has been determined by a student competition. © Glasgow Ice Box Challenge

Climate protection

“Better building design can help us reduce our carbon pollution without changing our behaviour. Buildings that prioritise efficiency are comfortable and healthy,” says Giorgia Tzar from the International Passive House Association (iPHA). The Ice Box Challenge in Glasgow has been coordinated by iPHA, the Passive House Institute’s international network, and it runs under the patronage of the UN’s Economic Commission for Europe (UNECE). The challenge is also part of the iPHA campaign “Efficiency: The First Renewable Energy”.

The International Passive House Association (iPHA) has coordinated the Glasgow Ice Box Challenge. © Glasgow Ice Box Challenge

#EfficiencyFirst

The 2021 campaign, #EfficiencyFirst, emphasises the foundational role efficiency plays in any building project: operating emissions over the building’s lifecycle overwhelm all other upfront carbon emissions. Therefore, it is indispensable for efficient climate protection to reduce energy consumption within the building sector at a very large scale. Equally, converting to an all-renewable energy future is not possible without this drastically reduced energy demand.

Starting July 23rd

The Ice Box Challenge at Glasgow’s St Enoch Square starts on 23 July. The Glasgow City Council, the Passivhaus Trust and Edinburgh Napier University will participate in the opening ceremony together with iPHA. Construction Scotland Innovation Centre has designed the two boxes after picking the design team via a student contest. During the closing ceremony on 6 August 2021, the remaining ice will be weighed. The winner of the contest will receive a weekend stay in a Passive House B&B in Great Britain. More information on the Glasgow Ice Box Challenge website: **www.IceBoxChallenge.org**.

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.

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.

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

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.

Prof Wolfgang Feist. © Peter Cook

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.

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