

EDINBURGH WORLD HERITAGE

Towards a Sustainable Energy City

Edinburgh has been the Scottish capital since the 15th century. Its World Heritage Site comprises of two distinct areas: the Old Town, dominated by a medieval fortress; and the neoclassical New Town, whose development from the 18th century onwards had a far-reaching influence on European urban planning. The harmonious juxtaposition of these two contrasting historic areas, each with many important buildings, is what gives the city its unique character. The Old and New Towns of Edinburgh were inscribed in the World Heritage list in 1995.

Edinburgh has become a worldwide reference in demonstrating that energy transition towards sustainable models in historic cities is possible. Edinburgh World Heritage (EWH), a charity funded by a broad alliance of partners, has deployed a wide array of initiatives and projects that define a way towards energy sustainability.

ENERGY HERITAGE & RENEWABLE HERITAGE

The Old and New Towns of Edinburgh World Heritage Site boast an outstanding variety of buildings with different architectural styles, materials and unique characters. These traditional buildings already have certain benefits in terms of environmental sustainability, including their longevity, thermal mass, locally-sourced materials and natural ventilation. Contrary to popular belief, it is possible to reduce energy inefficiency in traditional buildings, without compromising their authenticity.

Building conservation and energy efficiency are both key aspects of sustainability for Edinburgh World Heritage (EWH). Traditionally-built properties were built to last: many have been standing for hundreds of years, and well-maintained properties will continue to stand for many more. In order for them to continue to be comfortable in the future - without putting occupants at risk of fuel poverty – EWH promotes a range of viable interventions that can be adopted to improve their energy efficiency.

In partnership with Edinburgh-based Changeworks, EWH promoted the Energy Heritage project, providing a guide to improving energy efficiency in traditional and historic homes, covering all aspects of construction.

As a complement, the Renewable Heritage project sought to introduce clean energy technologies into traditionally-built, protected properties in Edinburgh's Old Town, a Conservation Area and part of the UNESCO World Heritage Site. This work built on the

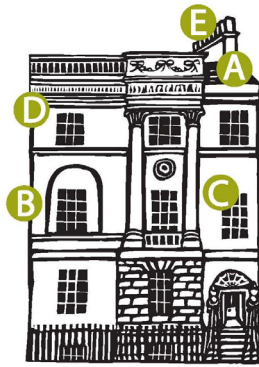
success of Energy Heritage project, which has subsequently been nationally and internationally recognised as an example of best practice. Renewable Heritage has shown that the sustainability and efficiency of energy in historic homes can be furthered by sensitive and appropriate use of clean energy generation systems.

© EWH. Renewables in a B-listed Georgian tenement - solar panels on a valley gutter roof.



Heat loss: Traditional Detached House

Traditional Tenement Flat



- A** Roof 32%
- B** Walls 24%
- C** Windows / Openings 11%
- D** Floor 6%
- E** Thermal bridging 7%
- F** Infiltration / Ventilation 20%

- A** Roof 5%
- B** Walls 45%
- C** Windows / Openings 19%
- D** Thermal bridging 8%
- E** Infiltration / Ventilation 23%

© EWH. Diagram heat loss.

GILMOUR’S CLOSE PROJECT

Gilmour’s Close is a 4 storey, 19th Century stone tenement, with commercial ground floor, located in the World Heritage site of Edinburgh’s Grassmarket. Refurbishment of this building was completed in 2008 to provide social rented and supported housing for Hillcrest Housing Association.

The refurbishment process sought not only to conserve the historic aspects of this listed structure, but also to incorporate low energy principles to the design in the form of ground source heating, passive solar strategies, mechanical ventilation with heat recovery (MVHR) and upgrade of the fabric’s thermal performance by internal lining.

© EWH. Energy Efficiency for Post-War Listed Buildings.

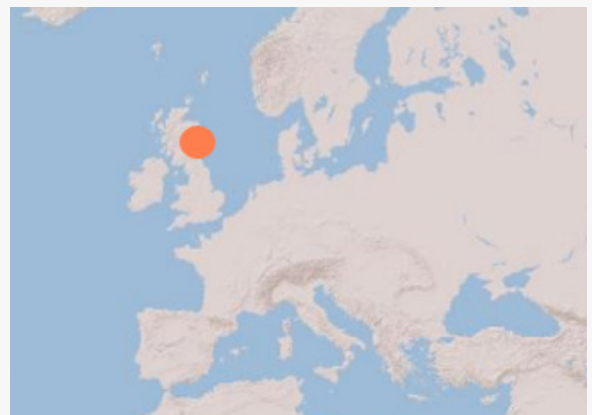
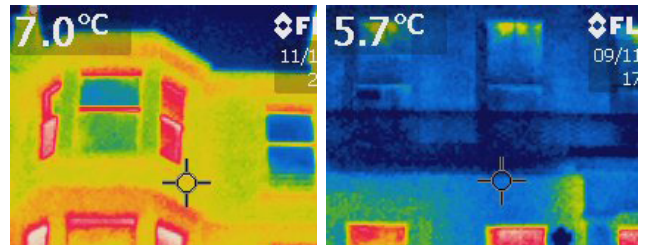


LESSONS LEARNED AND POTENTIAL REPLICABILITY

The idea of developing sustainable energy projects in heritage cities has been taboo for a long time, and in many cases it has been considered incompatible with their conservation.

Edinburgh’s experience shows that good levels of energy efficiency could protect the sustainability of traditional homes (both their fabric and their function), and ensure that householders achieve affordable warmth and improved comfort levels. It has also demonstrated that clean renewable energy can also be generated on site and on a much smaller scale, without compromising the quality and authenticity of the heritage. With the appropriate knowledge and good governance, microgeneration has a future role to play in historic cities.

Edinburgh can be a powerful performance reference for the 252 cities that host properties included in the World Heritage List, and for the thousands of historic cities and villages within the World Network of Biosphere Reserves. In fact, there are very few experiences of sustainable energy in historic cities worldwide.



WORLD HERITAGE SITE
OLD AND NEW TOWNS OF EDINBURGH - UK

Sources:
Edinburgh World Heritage
Changeworks