



## APPLEGREEN HOMES CASE STUDY: ENERGY EFFICIENT HOUSING OF THE FUTURE

**RISING UNEMPLOYMENT AND DRAMATICALLY INCREASING FUEL PRICES COULD LEAD TO SIGNIFICANT FUEL POVERTY IN THE UK UNLESS MORE IS DONE TO INVEST IN ENERGY EFFICIENCY. GAS AND ELECTRICITY BILLS FOR MILLIONS OF HOMES ARE EXPECTED TO ROCKET IN THE COMING YEARS, AS SUPPLIERS ATTEMPT TO OFFSET RISING WHOLESALE PRICES, ENERGY ANALYSTS HAVE WARNED.**

Households are considered by the UK Government to be in fuel poverty if they have to spend more than 10% of household income on fuel to keep their home to an adequate standard of warmth. One of the most effective ways of combating fuel poverty is to target energy efficiency measures in homes typically occupied by those on low incomes.

AppleGreen Homes worked with Glasgow Caledonian University and Glasgow-based Spacesix Architects to research and develop an affordable, energy efficient home for the future at the new BRE Innovation Park at Ravenscraig in Motherwell.

It features a solar energy package that will not only help significantly reduce electricity bills but will also drastically reduce heating bills, helping to eradicate fuel poverty. In addition, a guaranteed feed-in tariff from the solar electricity package will be paid to the owner, developer, housing association or council.



The BRE Scotland Innovation Park was inspired by the BRE Innovation Park in Watford and aims to showcase the future of Scottish housing in the first phase, with non-domestic properties to follow later. This will be achieved by demonstrating full scale buildings that include future techniques, technologies and processes that will drive a step change in the construction industry.

Taking a plot on the BRE Innovation Park for three years, AppleGreen Homes will demonstrate an entirely fitted out and furnished home starting from £50,000. AppleGreen aims to keep costs down in construction with speed of installation, sustainable recycled steel and eco effective products.

AppleGreen is working with sponsor partners to showcase their products within the eco house, including windows from NorDan, Solar Edge panels from Ubbink, air exhaust heat pump from NIBE, and underfloor heating system from Myson.

At Glasgow Caledonian University, experts in the School of Engineering and the Built Environment are involved in researching and testing the AppleGreen eco house's energy consumption credentials throughout the development.

GCU is also developing and installing a wireless sensor system into its homes, funded with a CIC Start Online grant. The system will measure energy inputs and outputs and analyse the real time energy performance of the house.

The environmental strategy for the house includes harvesting rain water, an exhaust air heat recovery system, effective insulation, under floor heating and solar energy panels.

AppleGreen Homes CEO Alan Wallace says: "Glasgow Caledonian University is helping us with energy analysis and calculations, which to be part of the BRE site must adhere to the strictest environmental guidelines.

The research being conducted by the University is allowing us to confidently go ahead. The house will be so energy efficient that it will be cheap to heat, vastly reducing power output. From that point of view, this is a very timely development as when you buy a house in the near future, a main concern will be how much does it cost to heat."

Glasgow Caledonian University's Dr Stas Burek has MSc and PhD degrees in energy technology and has previously worked as an energy consultant to local authorities and a Research and Development Engineer in energy-related

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manufacturing companies. He has over 25 years' experience of research, consultancy and teaching in a wide range of energy technologies.

Dr Burek's research interests include energy resource assessment, renewable energy, heat transfer in energy systems, energy policy and energy use in buildings. He has worked with business and public sector partners on projects including feasibility studies for renewable energy, CHP (Combined Heat and Power) and other technologies, renewable resource assessment, and practical monitoring, data collection and analysis.

The AppleGreen energy efficient home is intended to be one of several different styles of home by different developers alongside a Visitors' Centre providing full information on all of the buildings and products on the Innovation Park, while also showcasing a range of new designs and technologies. There are also plans for future BRE Innovation Parks in other parts of the world including Toronto, Brazil and Moscow.



**At Glasgow Caledonian University, we work with industry and public sector partners to ensure our expertise responds to the need for real-world innovation. GCU's strategic business development and knowledge transfer teams work with academic experts in our Schools and Research Institutes to support businesses with a problem-solving approach.**

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### FURTHER INFORMATION:

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