

Scottish Building Regulations: Review of Energy Standards Common Weal Consultation Response

Linda Pearson

11 September 2018

COMMON WEAL POLICY



COMMON WEAL is a non-profit “think-and-do tank” based in Glasgow which campaigns for greater social and economic equality, environmental sustainability, democratic participation and a higher quality of life based on an “All of Us First” approach. It was founded in 2014 and has since produced high quality, research-based policy proposals across a broad range of topics such as housing, energy, finance, social security and local democracy.

For more information on Common Weal Policy visit allofusfirst.org/policy or email craig@common.scot



Authors

Linda Pearson LLB is a Policy Officer at Common Weal who researches and writes about a broad range of policy areas.

Contents

Foreword

page 01

Achieving further carbon abatement from new and existing buildings

page 02

New buildings

page 02

Existing buildings

page 02

Achieving on-site carbon abatement through solar thermal and solar PV

page 03

Benefits of passive standards

page 03

Foreword

The Scottish Government is currently undertaking a review of the energy standards in the Scottish Building Regulations. The review will consider how the energy performance of buildings in Scotland can be improved and how new energy standards could contribute to the greenhouse gas abatement targets in the Climate Change (Scotland) Act 2009. This report forms Common Weal's response to the first stage of the review, which is a call for evidence on the effectiveness of the 2015 building energy standards, and is part of our ongoing work on energy and housing policy.

As Common Weal has previously argued, buildings are a major contributor to greenhouse gas emissions in Scotland so improvements to the energy standards of existing and new buildings should play a prominent role in Scotland's environmental policy. Heat makes up over half of Scotland's total energy use budget, therefore measures to reduce overall demand will make it easier for Scotland to complete the transition to a nation powered only by renewable energy sources. Improvements to the energy standards of homes are also key to tackling fuel poverty, which currently affects one third of Scottish households.

Here we argue that legislation should mandate the best energy standard possible for new and existing buildings, rather than continuing the Scottish government's current incremental approach towards improving standards. Passive or net-zero energy standards should be mandated for new buildings, while the maximum technically feasible energy standard should be applied to all existing buildings. This would achieve dramatic reductions in the space heating requirements of Scottish buildings, as demonstrated by our examples.

This submission also draws on our response to the Scottish government's call for views on the objectives of the proposed Scottish publicly owned energy company (POEC), which argues that the POEC should facilitate the deployment of solar thermal and solar photovoltaics panels to Scottish homes. This could help achieve net-zero energy standards for existing homes and would make a significant contribution towards tackling fuel poverty.

Achieving further carbon abatement from new and existing buildings

Common Weal endorses the recommendations in the Energy Poverty Research (EPR) initiative's response to this call for evidence¹. In this response, we include additional recommendations related to two of the themes in part 2 of the call for evidence: "Achieving further carbon abatement from new buildings" and "Achieving further carbon abatement from existing buildings".

Common Weal believes that the Scottish government should mandate a passive or net-zero energy standard for all new domestic and non-domestic buildings in Scotland, while the maximum technically feasible energy standard should be applied to all existing buildings.

As heating currently accounts for around 51%² of Scotland's total energy consumption, implementation of these measures would make a significant contribution towards achieving the greenhouse gas emission reduction targets in the Climate Change (Scotland) Act 2009 and the Scottish Government's Climate Change Delivery Plan. The reduction in energy costs would also help the many thousands of people in Scotland who currently experience fuel poverty and its associated detrimental effects. According to the latest figures, 26.5% (or around 649,000) of Scottish households live in fuel poverty while 7.5% of households (183,000) live in extreme fuel poverty³. We agree with the EPR's view that this is unacceptable in contemporary Scotland.

New buildings

Passive standards for all new buildings should be introduced via legislation which sets a period between enactment and the introduction of the standard to allow the building industry to adjust its supply chains and building practices. This would be preferable to the staged

amendment of building energy standards currently used by the Scottish government. This approach creates ongoing upheaval for the construction industry and is inherently inefficient, as new buildings have to be retrofitted at a later date to meet revised standards.

Existing buildings

The retrofitting of existing buildings is more challenging, as many were not designed to accommodate passive standards. However, the Scottish government's current program of retrofitting all existing houses up to EPC Rating C efficiency by 2040 raises the same concerns about efficiency. If a decision is made at a later date to retrofit existing buildings up to passive, net zero carbon or EPC A standard, buildings that were upgraded to EPC Rating C will need to be retrofitted again.

It would be more efficient for existing buildings to be upgraded once to the highest energy standard that is technically feasible. Common Weal therefore proposes that the Scottish government create a framework under which any given building can be assessed on its potential for a maximum technically feasible upgrade. Buildings which could easily meet rating EPC A could be upgraded straight to that level, obviating the need for multiple retrofits.

¹ Dr Keith Baker, Dr Ron Mould, & Dr Geoff Wood, "Response of the Energy Poverty Research initiative to the Scottish Government's Call for Evidence on the Scottish Building Regulations: Review of Energy Standards", August 2018, available at <http://energypovertyresearch.blogspot.com/p/consultation-responses.html>.

² Scottish Government, "Energy in Scotland 2018", February 2018.

³ Scottish Government, "Scottish House Condition Survey: 2016 Key Findings", December 2017.

Achieving on-site carbon abatement through solar thermal and solar PV

Where it is not possible to achieve passive standards in new and existing buildings, Common Weal believes that a net-zero energy standard should be adopted. We agree with the EPR's view that the necessary on-site carbon abatement can be achieved through greater use of solar thermal and solar photovoltaics. The Solar Trade Association estimates that Scotland's current solar PV capacity of 188 MW could be increased to 2GW across by 2020⁴.

The installation of domestic solar thermal and PV panels in Scottish homes would help to alleviate fuel poverty, while the development of large-scale solar thermal installations could provide district heating as part of mixed technology systems using locally and sustainably-sourced biomass, inter-seasonal thermal storage, and heat recovery. Common Weal has elsewhere argued that Scotland's publicly owned energy company should facilitate the development of both small and large-scale solar projects⁵.

Benefits of passive standards

Buildings built to passive standards require very little energy for heating, leading to a reduction in greenhouse gas emissions and energy costs. There are a number of standards which can be adopted to improve energy efficiency and move towards passive heating standards, such as PassivHaus, MINERGIE-P and AECB CarbonLite Gold Standard. Common Weal will undertake further research in this area and we do not endorse one particular standard, however, we use the example of PassivHaus here to illustrate the benefits of the adoption of passive standards for new buildings in Scotland.

PassivHaus uses five principles to achieve passive standards: thermal bridge free design, superior windows, ventilation with heat recovery, quality insulation and airtight construction. The PassivHaus Institute sets the following criteria that must be met for a building to meet the PassivHaus standard:

1. The **SPACE HEATING ENERGY DEMAND** is not to exceed 15 kWh per square meter of net living space (treated floor area) per year or 10 W per square meter peak demand.

In climates where active cooling is needed, the **SPACE COOLING ENERGY DEMAND** requirement roughly matches the heat demand requirements above, with an additional allowance for dehumidification.

2. The **RENEWABLE PRIMARY ENERGY DEMAND (PER,**

ACCORDING TO PHI METHOD): the total energy to be used for all domestic applications (heating, hot water and domestic electricity) must not exceed 60 kWh per square meter of treated floor area per year.

3. In terms of **AIRTIGHTNESS**, a maximum of 0.6 air changes per hour at 50 Pascals pressure (ACH50), as verified with an onsite pressure test (in both pressurized and depressurized states).
4. **THERMAL COMFORT** must be met for all living areas during winter as well as in summer, with not more than 10 % of the hours in a given year over 25 °C.

The PassivHaus space heating requirement is 50% less than the current voluntary "Gold level" of sustainability for new houses in Scotland, which sets a space heating requirement of 30 kWh/m² per year⁶. New Scottish homes built to PassivHaus standards would require 89% less space heating than the average existing UK home, which requires 140 kWh/m² per year. The introduction of this standard would also have the potential to greatly reduce the space heating requirements of non-domestic buildings, such as non-food shops and hotels which typically require 170 kWh/m² per year and 330 kWh/m² per year respectively⁷.

Achieving passive standards through retrofitting is not always possible so other energy efficiency standards have been developed for existing buildings, such as

⁴ Solar Trade Association, "STA Scotland: key facts and statistics", available at: <http://www.solar-trade.org.uk/wp-content/uploads/2016/03/Key-facts-and-statistics-Solar-in-Scotland-v8.pdf>

⁵ K Baker, G Morgan, R Mould, G Wood, I Wright, "Public Energy Company Common Weal Consultation Response", September 2018, available at: <http://allofusfirst.org/library/public-energy-company-common-weal-consultation-response/>

⁶ UK Government, "National Energy Efficiency Data-Framework", pg 15, June 2013.

⁷ Resource Efficient Scotland, "How to Save Money and Energy on Space Heating", pg 7, February 2016.

EnerPhit. EnerPhit uses PassivHaus principles and has a maximum space heating requirement of 25 kWh/m² per year. Retrofitting existing UK homes to Enerphit standards would therefore achieve an average 82% reduction in space heating requirements. A case study undertaken by Common Weal showed that the projected cost of heating a 52 m² semi-detached house in Scotland retrofitted to Enerphit standards would be £11.83 per month, compared

to £107 per month for the same sized dwelling built to current basic energy standards.

There are other ways to achieve passive standards which the Scottish government should explore, such as the use of locally-sourced timber in building construction. Common Weal intends to undertake further research and policy development in this area.



www.allofusfirst.org

craig@common.scot

3rd Floor, 111 Union St,
Glasgow, G1 3TA

COMMON WEAL POLICY

