

# Scottish Government Building Standards Ministerial View Reference V2019/2

## Functional Standard 6.1 Carbon Dioxide Emissions

Standard 6.1 (Carbon Dioxide Emissions) states: “Every building must be designed and constructed in such a way that:

- a. the energy performance is estimated in accordance with a methodology of calculation approved under regulation 7(a) of the Energy Performance of Buildings (Scotland) Regulations 2008, and
- b. the energy performance of the buildings is capable of reducing carbon dioxide emissions.

## Verifier

Highland Council

## Technical Context

The subject of the view is a new detached 2 storey dwelling with a total floor area of 179m<sup>2</sup>. Space heating is provided by a biomass stove (wood pellet) with an outlet to duct heat to another part of the dwelling. Space heating is not required all year round, and the more efficient method of meeting the hot water demand is by an air source electric heat pump. The dwelling has an air infiltration rate of 3.46m<sup>3</sup>/h.m<sup>2</sup> with ventilation provided by a mechanical ventilation heat recovery system. Triple glazed windows are provided and the fabric U-values are of a high standard relative to the backstop values cited in the guidance.

The guidance in clause 6.1.1 confirms that the calculated carbon emissions for the proposed dwelling (dwelling emissions rate) should be less than, or equal to, the target carbon dioxide emissions for a notional dwelling.

The target carbon dioxide emissions is calculated for a ‘notional dwelling’ having the same size, shape, living area fraction as the proposed building and inputting a set of standard values from the relevant fuel package of table 6.1 of guidance clause 6.1.2.

The calculated carbon dioxide emissions for the actual building exceed the target emissions rate for the notional building. A significant factor in the disparity between the two calculated ratings is due to the carbon factors of the fuel used to provide the hot water demand. The target emissions rate is based upon hot water demand being met by a biomass boiler attributed with a low carbon factor (0.039). The dwelling emission rate is based upon the air source heat pump attributed with the higher carbon factor assigned to electricity (0.519).

Whilst the guidance in 6.1.1 recognises options for the splitting of heating load in determining the target emission rate, no such mechanism is identified for apportioning energy and emissions from water heating. However, whilst the target emissions rate has been exceeded the actual dwelling's emissions are low (the dwelling, as constructed would sit within the top 3% of recent completions based upon Q1 2019 EPC data). In energy terms, when compared to the notional dwelling, the space heating demand is reduced by 46% whilst the energy required for water heating is reduced by 39%.

In general terms, Standard 6.1 does not seek to influence the designed energy performance of buildings based on the carbon intensity of fuel choice. This is the overall premise for setting the target emissions rate based upon the relevant fuel package stated in table 6.1 of clause 6.1.2.

### **The view of Scottish Ministers**

On behalf of Scottish Ministers, the Building Standards Division has considered all the information submitted in this case and their view is set out below.

- There is a very high overall specification across the building fabric and ventilation provision.
- Provision of hot water is by the use of the most efficient means practical with space heating using a renewable biofuel.
- There appears to be no aspect of this project that does not seek to improve on the minimum standards set through published guidance within the current Domestic Technical Handbook.
- Whilst the target emissions rate has been exceeded, the actual dwelling emissions rate is very low.

**Having carefully considered all the information submitted in this case, it is the view of Scottish Ministers that the proposals do meet the requirements of Standard 6.1.**