



Informing the Part L 2013 consultation

FABRIC ENERGY EFFICIENCY FOR PART L 2013

CLASSIFICATION METHODOLOGY FOR DIFFERENT DWELLING TYPES

February 2012

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Introduction

This report has been produced by the Zero Carbon Hub and AECOM in support of the 2012 Building Regulations Part L consultation package.

The consultation proposals for Part L 2013 standards relating to new homes include the recommendation that they should comply with a mandatory minimum fabric performance standard (Target Fabric Energy Efficiency, TFEE) in addition to the mandatory carbon emissions standard (Target CO₂ Emission Rate, TER). This is a change from the current requirements, where the Approved Document includes a set of elemental backstops for the building fabric as guidance only.

The consultation proposes that the minimum fabric performance standard should be based on the methodology of the Fabric Energy Efficiency Standard as put forward by a Zero Carbon Hub Task Group in 2009, and subsequently adopted for Ene2 of the Code for Sustainable Homes (CSH) in November 2010.

This report includes a summary of the Fabric Energy Efficiency (FEE) methodology and the levels being consulted upon within the 2012 Part L consultation. In relation to this, it describes proposals for classifying different dwellings and utilising a 'sliding scale' for certain mid-terrace dwellings. It also explains proposals on how building averaging for apartments and terraces could be carried out.

The methodology for dwelling classification described in this document is primarily to support the 2012 Part L consultation, which is seeking feedback on the proposed introduction of the FEE methodology and the minimum level at which this should be set. This document is presented as a draft for consultation and while it may also be used to help determine the appropriate FEE scale for dwellings looking to achieve CSH Ene2 credits, it should not be read as definitive guidance to the CSH.

Comments on the proposals in this document are welcomed. These can either be sent directly to the Zero Carbon Hub at FEES@zerocarbonhub.org or as part of a response to the 2012 DCLG consultation on the proposed changes to Part L and must be received by 27th April 2012. The consultation documents are available from: www.communities.gov.uk/publications/planningandbuilding/brconsultationsection2

An additional document giving examples of specifications which meet the two proposed TFEE options as set out in the Part L 2013 consultation is available from www.zerocarbonhub.org/consultations.aspx?news=26.

The latest Code for Sustainable Homes Technical Guide can be downloaded from www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

What is considered in this guide

The main purpose of this document is to provide support to the 2012 Part L consultation by outlining the proposals for dwelling classification in order to help determine the appropriate Target Fabric Energy Efficiency (TFEE).

This guide includes a summary of the FEE methodology and the two alternative levels being consulted upon as a minimum standard for Part L 2013 - 'Interim FEE' and 'Full FEES'. It also gives an overview of the levels adopted in the Code for Sustainable Homes.

The methodology for calculating the TFEE on a 'sliding scale' is explained. This is applicable for mid-terrace dwellings that have additional exposed side wall areas due to staggered terraces, steps to accommodate changing terrain, or integral unheated spaces like garages or drive-throughs. Two worked examples are provided.

The calculation method for averaging the TFEE and DFEE for buildings containing multiple units (e.g. apartment blocks and terraces) has been described. Instances where averaging may or may not be used have also been explained in this section.

This document then goes on to provide guidance in the form of example illustrations for appropriate dwelling classification. It is hoped this will be useful to help determine the applicable TFEE level for a particular dwelling.

Finally, it is acknowledged that further development of the FEES methodology and application is likely to be required and feedback is encouraged from those who have experience with working to the standard.

Terms used in this guide

CSH	Code for Sustainable Homes
Ene2	CSH Fabric Energy Efficiency credit category
FEE	Fabric Energy Efficiency
FEES	Fabric Energy Efficiency Standard
DER	Dwelling CO ₂ Emission Rate
DFEE	Dwelling Fabric Energy Efficiency
TER	Target CO ₂ Emission Rate
TFEE	Target Fabric Energy Efficiency
Lower limit	TFEE generally applicable to apartment blocks and mid-terrace houses within each FEE level – i.e. 43kWh/m ² /yr for 'Interim FEE' and 39kWh/m ² /yr for 'Full FEES'
Upper limit	TFEE applicable to end-terrace, semi-detached & detached houses within each FEE level– i.e. 52kWh/m ² /yr for 'Interim FEE' and 46kWh/m ² /yr for 'Full FEES'
FOG	Flat Over Garage
'Sliding scale'	Proposed methodology for adjusting the TFEE for mid-terrace dwellings with additional heat loss from side walls
Stepped	Change in ground floor level relative to adjoining houses in a terrace (in reference to 'sliding scale')
Staggered	Changes in the façade plane relative to adjoining houses in a terrace (in reference to 'sliding scale')
Side wall	Walls perpendicular to the façade in a terraced dwelling (which would be referred to as party walls when between two adjoining dwellings)
Building averaging	The Building Regulations (see Regulations 26 and 35) currently allow the Target Emissions Rate (TER) and Dwelling Emission Rate (DER) to be averaged in a building containing multiple dwellings, such as an apartment block or terrace. Guidance is provided in sections 4.6 and 4.14 of Approved Document L1A (2010)

The Fabric Energy Efficiency Standard

The Fabric Energy Efficiency Standard (FEES) was first developed specifically in response to developing a strategy for the 2016 zero carbon homes requirement by an industry Task Group led by the Zero Carbon Hub in 2009.

The Fabric Energy Efficiency (FEE) methodology considers the space heating and cooling demand of a dwelling and the FEE achieved is affected by:

- Building fabric U-values;
- Thermal bridging;
- Air permeability;
- Thermal mass;
- Features which affect lighting and solar gains.

The FEE is measured in kWh/m²/yr, and is not influenced by building services, for example heating system, fixed lighting or ventilation strategy. It is a performance standard, meaning that different combinations of fabric specification can be used to reach a particular level. This allows flexibility when developing a fabric specification.

Calculation methodology

The full procedure for calculating the DFEE is defined in Section 11 of the SAP2012 Specification (www.bre.co.uk/sap2012)¹. For Part L 2013, it is proposed that UK average weather data should be used for both heating and cooling for the purposes of this calculation².

Note that the current TFEE values are based on the SAP2009 methodology. A consultation proposing changes to SAP2012 (which will, when finalised, be used by Part L 2013) was published on 4th January and closes on 28th March 2012. It contains a number of proposed changes to SAP which may affect the FEE calculations. It is expected that the mandatory TFEE values that are being proposed in the 2012 Part L consultation would have to be re-based to take these changes into consideration.

¹ The procedure for calculating FEE is also defined in Section 11 of SAP2009 Specification (www.bre.co.uk/sap2009), although this implementation did not specify cooling demand to be calculated using UK Average weather data.

² DCLG, *2012 Consultation on changes to the Building Regulations in England, Section two – Part L, Proposed changes to technical guidance*, page 90, paragraph 31

Target Fabric Energy Efficiency

During development of the Fabric Energy Efficiency Standard, different Target FEE values were set for different dwelling types. This reflected the intention that, for any particular level, the values could be achieved by similar fabric specifications; apart from the case of detached houses which would be pushed further. Consideration at the time was given to the relative space heating demand of different dwelling types.

Therefore, under the FEE methodology, for any particular level, there is a lower limit which applies, in general, to apartment blocks and mid-terrace houses and an upper limit which applies, in general, to end-terrace, semi-detached and detached houses.

TFEE for Part L 2013

The 2012 Part L consultation considers two possible levels at which to set the minimum fabric energy efficiency, referred to in the proposals as the Target Fabric Energy Efficiency, or TFEE, and this term is used throughout the rest of this document:

Interim FEE:

- 43kWh/m²/yr for apartment blocks and mid-terrace houses (lower limit)
- 52kWh/m²/yr for end-terrace, semi-detached and detached houses (upper limit)

Full FEES:

- 39kWh/m²/yr for apartment blocks and mid-terrace houses (lower limit)
- 46kWh/m²/yr for end-terrace, semi-detached and detached houses (upper limit)

'Interim FEE' is equivalent to the requirement for five CSH Ene2 credits³. 'Full FEES' is the standard which a task group led by the Zero Carbon Hub recommended as the minimum requirement for zero carbon homes, and is equivalent to the requirement for seven CSH Ene2 credits.

³ November 2010 version

Code for Sustainable Homes Ene2

The FEE methodology was adopted within the Code for Sustainable Homes November 2010 version, with up to 9 credits available in section Ene2 for achieving a range of specific fabric performance levels.

The Ene2 credit scale is set out below, alongside reference to the two levels being consulted upon for Part L 2013:

Dwelling type		Credits*	Part L 2013 consultation levels
Apartment blocks, Mid-terrace	End-terrace, Semi-detached & Detached		
Fabric Energy Efficiency kWh/m ² /yr			
≤ 48	≤ 60	3	
≤ 45	≤ 55	4	
≤ 43	≤ 52	5	'Interim FEE'
≤ 41	≤ 49	6	
≤ 39	≤ 46	7	'Full FEES'
≤ 35	≤ 42	8	
≤ 32	≤ 38	9	

Although focused on the Part L 2013 consultation, much of the guidance in this document, including example illustrations for dwelling classification, is applicable to CSH Ene2. However, the following points should be noted:

- Treatment of mid-terrace dwellings:
For mid-terrace dwellings identified as 'special cases' in the CSH Ene2 guidance, (e.g. 'stepped' or 'staggered' units) the calculation methodology for the 'revised FEE performance benchmark' is as described under "sliding scale" for mid terrace dwellings' on page 5 of this document, and is referred to as the TFEE.
- Building averaging
As an option under the current CSH Ene2 guidance, FEE performance for an apartment block can be averaged as described under 'Dwelling FEE' on page 6 of this document. While averaging FEE performance across terraces is proposed in the 2012 Part L consultation, it is **not** included in the current version of the CSH.

Any proposals taken forward in Part L would need to be considered in future reviews of the CSH. CSH assessors should always refer to the official CSH guidance and seek clarification from their Code Service Provider if required.

Overview of dwelling type classification

The TFEE is determined by dwelling type. Many designs are simple to categorise and would fall into either the upper or lower limit for the TFEE: for example a detached house (upper limit), or a mid-terrace unit in a linear terrace (lower limit).

Where this is not the case, some additional flexibility has been proposed. Some cases are listed below and feedback is sought alongside the 2012 Part L consultation.

- A 'sliding scale' (between the upper and lower limits) has been developed to adjust the TFEE for mid-terrace houses where there are additional heat loss side wall areas, for example due to inclusion of integral garage, drive-through, or steps and/or staggers in the terrace. The calculation method for the 'sliding scale' is given on page 5.
- A method for dealing with some apartment blocks where the lower limit may not be appropriate, for example, small blocks containing apartments with characteristics similar to detached or semi-detached houses. It is suggested that these could be assessed against the upper limit.

Buildings containing multiple dwellings

Where a building contains multiple dwellings, for Part L 2013 it is proposed that the DFEE and in some cases the TFEE can be averaged in the following way, as described further on page 6:

For apartment blocks:

- DFEE for the block is the floor-area-weighted average of all the individual DFEEs
- TFEE is already defined by building type, so no averaging is necessary

For a terrace of houses⁴:

- DFEE for the terrace is the floor-area-weighted average of all the individual DFEEs
- TFEE for the terrace is the floor-area-weighted average of all the individual TFEEs (including TFEE on the 'sliding scale', if present)

Note that it is **not mandatory** to adopt the averaging approach.

⁴ Note that terrace averaging is proposed in the 2012 Part L consultation but is not currently acceptable in the Code for Sustainable Homes

'Sliding scale' for mid-terrace units

Where the heat loss characteristics of a mid-terrace house tend towards those of an end-terrace (due to additional heat loss side wall area: for example a 'stepped' or 'staggered' terrace or dwellings with internal garages or drive-throughs), it is proposed that the TFEE is adjusted to reflect this along a 'sliding scale'⁵. No sliding scale adjustment is needed for end-terrace or semi-detached units, as these dwellings are already assumed to be assessed at the upper limit.

Calculation for the 'sliding scale'⁶

The calculation method is described in the CSH Ene2 guidance (November 2010) as:

$$\text{TFEE} = B_{\text{MT}} + (2 \times (B_{\text{ET}} - B_{\text{MT}}) \times R) \quad \text{for } 0 < R < 0.5$$

$$\text{TFEE} = B_{\text{ET}} \quad \text{for } R \geq 0.5$$

Where: B_{MT} = Standard mid-terrace FEE performance benchmark (lower limit)

B_{ET} = Corresponding standard end-terrace FEE performance benchmark (upper limit)

R = ratio of exposed/ semi-exposed side wall area to total side wall area (rounded to two decimal places)

$$\text{i.e. } R = \frac{\text{Exposed side wall area (m}^2\text{)} + \text{semi-exposed side wall area (m}^2\text{)}}{\text{Total side wall area (m}^2\text{)}}$$

For 'Interim FEE' this simplifies to:

$$\begin{array}{lll} \text{TFEE} = 43 + (18 \times R) & \text{for } 0 < R < 0.5 \\ \text{TFEE} = 52 & \text{for } R \geq 0.5 \end{array}$$

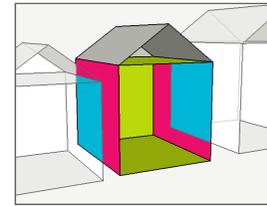
For 'Full FEES' this simplifies to:

$$\begin{array}{lll} \text{TFEE} = 39 + (14 \times R) & \text{for } 0 < R < 0.5 \\ \text{TFEE} = 46 & \text{for } R \geq 0.5 \end{array}$$

⁵ Note that it is not mandatory to use the sliding scale; the lower limit can be used.

⁶ It is expected that tools will be available either within or supporting SAP2012 software to undertake this calculation.

Example 1: Mid-terrace house, with step and stagger



Target = 'Interim FEE'

$$\text{Hence, TFEE} = 43 + (18 \times R)$$

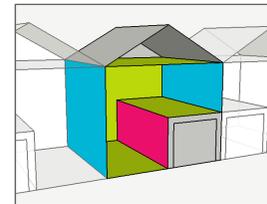
$$\text{Pink area} = \text{exposed/ semi-exposed side wall} = 9.00\text{m}^2$$

$$\text{Blue area} = \text{party wall area} = 62.40\text{m}^2$$

$$R = \frac{(\text{pink area})}{(\text{pink area} + \text{blue area})} = \frac{9.00}{(9.00 + 62.40)} = 0.13$$

$$\text{Therefore, for this home, TFEE} = 43 + (18 \times 0.13) = \mathbf{45.34} \text{ kWh/m}^2\text{/yr}$$

Example 2: Mid-terrace house, with integral garage



Target = 'Full FEES'

$$\text{Hence, TFEE} = 39 + (14 \times R)$$

$$\text{Pink area} = \text{exposed/ semi-exposed side wall} = 16.80\text{m}^2$$

$$\text{Blue area} = \text{party wall area} = 54.60\text{m}^2$$

$$R = \frac{(\text{pink area})}{(\text{pink area} + \text{blue area})} = \frac{16.80}{(16.80 + 54.60)} = 0.24$$

$$\text{Therefore, for this home, TFEE} = 39 + (14 \times 0.24) = \mathbf{42.36} \text{ kWh/m}^2\text{/yr}$$

Key for illustrations

- Exposed/ semi-exposed surface (i.e. non-party heat-loss surface)
- Party surface, between two adjoining dwellings (heated areas)
- Additional exposed/semi-exposed surface (i.e. additional non-party heat-loss surface) – 'sliding scale' dwellings only

Building averaging

The Building Regulations currently allow the Target Emission Rate (TER) and Dwelling Emission Rate (DER) to be averaged in a 'building'. This can apply, for instance, to an apartment block or a terrace of houses – 'buildings' which contain more than one dwelling. Sections 4.6 and 4.14 of Approved Document L1A (2010) provide guidance on how to do this. The 2012 Part L consultation considers extending this to the calculation of the TFEE and DFEE.

For Target FEE – Apartments

For apartment blocks, no averaging is required for the TFEE. The FEE methodology already envisages that block averaging would likely take place to share the benefits of mid-floor apartments generally having less heat loss than ground or top floor apartments. Within the FEE methodology this was the basis for assigning the lower limit to apartment blocks.

For Target FEE - Terraces⁷

For a terrace of houses it is proposed that compliance may be demonstrated for the building (terrace) as a whole. The purpose of averaging the TFEE across a terrace is to allow the optimisation of the fabric specification for all the dwelling types that comprise the terrace.

The general formula for calculating the TFEE for the terrace is as follows:

$$TFEE_{Ave} = \frac{\{(TFEE_1 \times \text{Floor area}_1) + (TFEE_2 \times \text{Floor area}_2) + \{(TFEE_3 \times \text{Floor area}_3) + \dots\}}{\{\text{Floor area}_1 + \text{Floor area}_2 + \text{Floor area}_3 + \dots\}}$$

A terrace can comprise a linear row of houses, or could be more complex with the inclusion of stepped and/or staggered units and other variations such as integral garages or passages. For Part L purposes (but not the CSH) this implies that the TFEE for such a terrace could be adjusted twice – first on the sliding scale to calculate the adjusted TFEE for the mid-terrace units, and then again because the TFEE can be averaged across the whole terrace/ building. This double-adjustment would be optional, not mandatory.

More detail on terrace averaging for different lengths of terrace can be found in the document 'Fabric Standards for 2013 – Worked examples'⁸.

⁷ Terrace averaging is not currently acceptable within the CSH.

⁸ Available from <http://www.zerocarbonhub.org/consultations.aspx?news=26>

For Dwelling FEE

The general formula for calculating the DFEE for an apartment block or terrace is as follows:

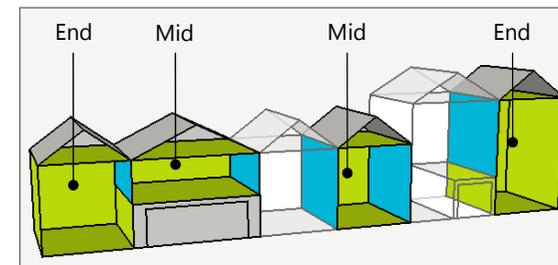
$$DFEE_{Ave} = \frac{\{(DFEE_1 \times \text{Floor area}_1) + (DFEE_2 \times \text{Floor area}_2) + \{(DFEE_3 \times \text{Floor area}_3) + \dots\}}{\{\text{Floor area}_1 + \text{Floor area}_2 + \text{Floor area}_3 + \dots\}}$$

Note that terrace averaging is not currently acceptable within the CSH.

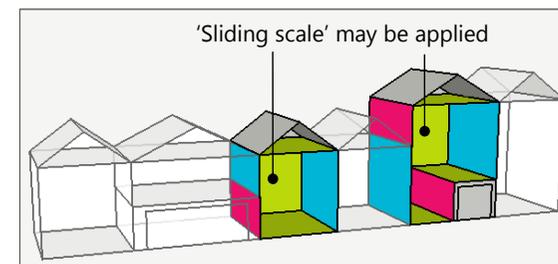
Example 3: Terrace averaging for Target FEE level

In order to derive the average TFEE for the terrace illustrated below, the TFEE for each individual unit would need to be determined in the first instance.

The first illustration of a terrace of six houses identifies units which would be assessed as mid-terrace, at the lower limit, or end-terrace, at the upper limit, of the FEE level.



In the second illustration, the mid-terrace houses which have additional heat loss from side walls (highlighted in pink) have been identified. The TFEE for these can be calculated using the 'sliding scale' method described on page 5, as an option to using the lower limit.



The area-weighted average of the TFEE of individual units will determine the average TFEE of the terrace.

Dwelling classification – Description and examples

The following pages give general descriptions of dwelling classifications, along with illustrations of dwelling types which fall under those classifications.

For ease of reference, the description and examples of dwelling classification have been grouped by applicable FEE limit (lower, upper, 'sliding scale') and dwelling type:

- Lower limit – Mid-terrace houses & FOGs
Single dwelling units over one or more storeys in a linear terrace with adjoining dwelling units on either side
- Lower limit – Apartments
Multiple storey buildings containing multiple dwelling units per floor
- Upper limit – End-terrace/ Semi-detached houses & FOGs
Single dwelling units over one or more storeys with adjoining dwelling units on one side
- Upper limit – Detached houses & FOGs
Single dwelling units over one or more storeys with no adjoining dwelling units to any side
- Upper limit – Apartments
Apartments contained in small blocks, with characteristics similar to detached, semi-detached or end-terrace houses
- 'Sliding scale'
Single mid-terrace dwelling units over one or more storeys with additional heat loss side wall areas (as described on page 5)

The example illustrations are by no means exhaustive but are intended to offer some clarification on the classification of dwellings for the adoption of the applicable TFEE. While this is annotated in terms of 'Interim FEE' and 'Full FEES' this section also applies to any CSH Ene2 credit level (November 2010 version).

Key for illustrations



Exposed/ semi-exposed surface (i.e. non-party heat-loss surface)



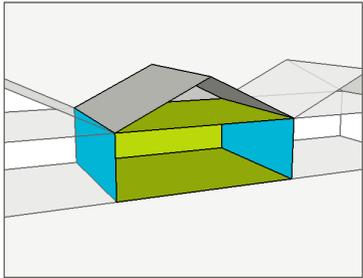
Party surface, between two adjoining dwellings (heated areas)



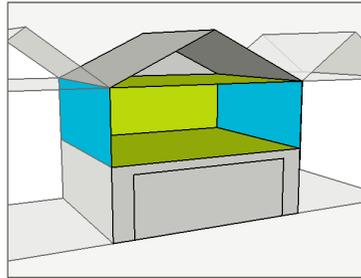
Additional exposed/semi-exposed surface (i.e. additional non-party heat-loss surface) – 'sliding scale' dwellings only

Lower limit – Mid-terrace houses & FOGs (43 for 'Interim FEE'; 39 for 'Full FEES')

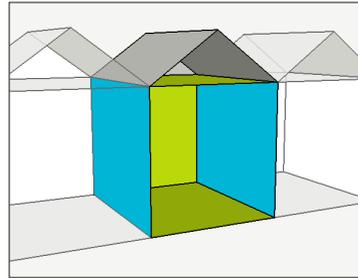
This applies to mid-terrace dwellings where all side walls are party walls. Refer to 'Sliding scale' section on page 5 for all other cases.



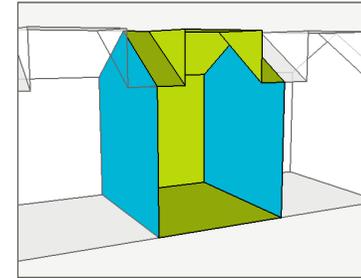
Mid-terrace bungalow



Mid-terrace FOG



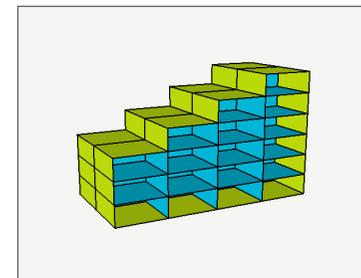
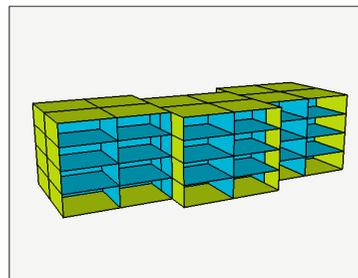
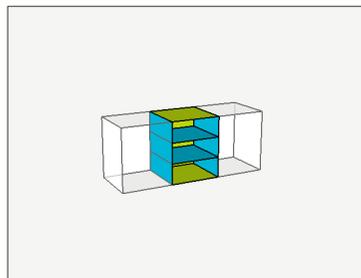
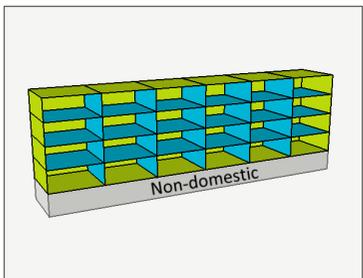
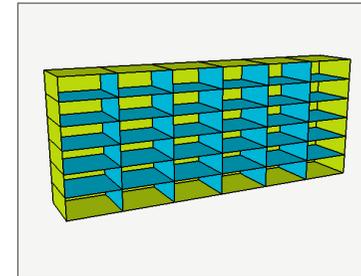
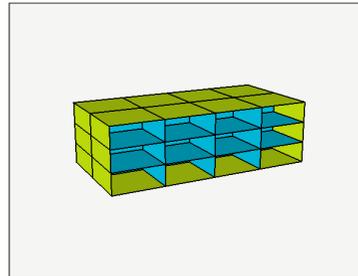
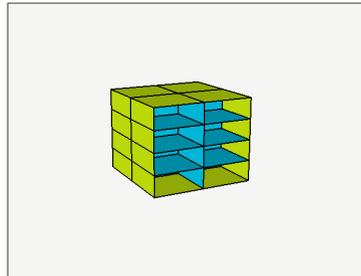
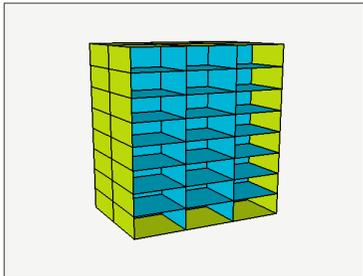
Mid-terrace house



Mid-terrace with room in roof

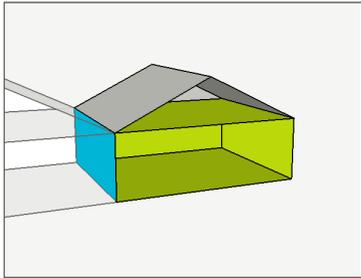
Lower limit – Apartments (43 for 'Interim FEE'; 39 for 'Full FEES')

This applies to all apartment blocks except for those small blocks which have similar heat-loss characteristics to detached, semi-detached and end-terrace or houses (which are listed under 'Upper limit - Apartments').

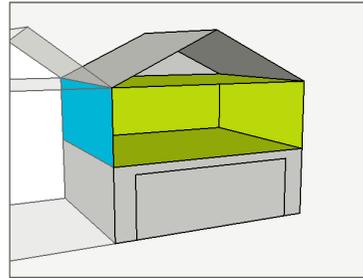


Upper limit – End-terrace/ Semi-detached houses & FOGs (52 for 'Interim FEE'; 46 for 'Full FEES')

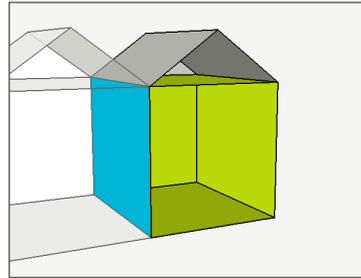
This applies to all end-terrace/ semi-detached dwellings, including those with steps and/or staggers and other additional heat loss side wall areas.



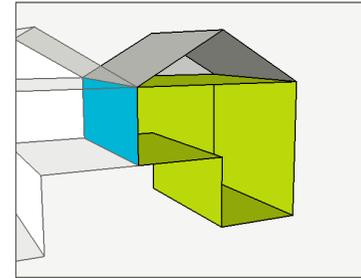
End-terrace/ Semi-detached bungalow



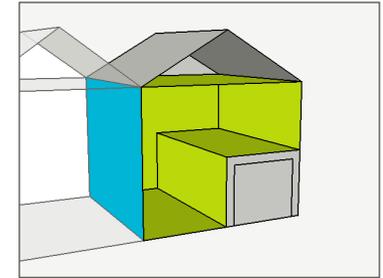
End-terrace/ Semi-detached FOG



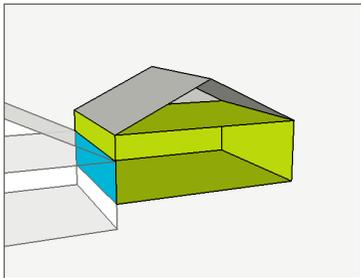
End-terrace/ Semi-detached house



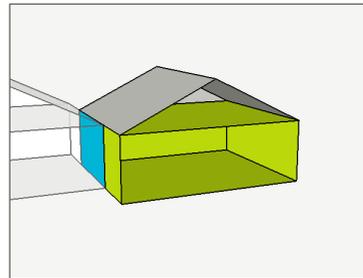
End-terrace/ Semi-detached house with drive-through



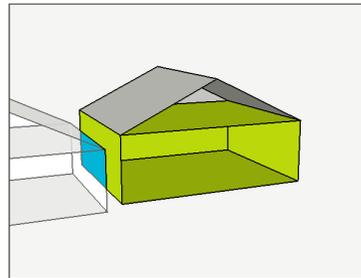
End-terrace/ Semi-detached house with integral garage



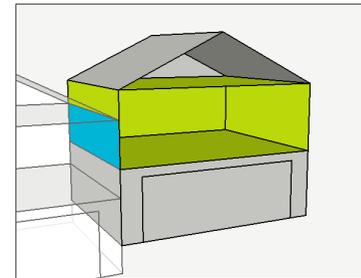
End-terrace/ Semi-detached bungalow - stepped



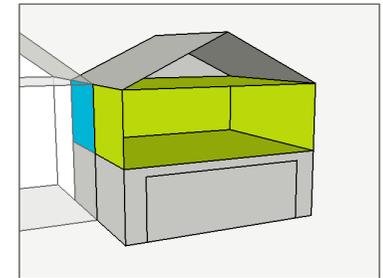
End-terrace/ Semi-detached bungalow - staggered



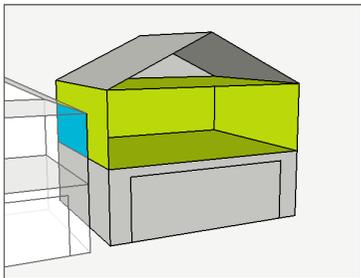
End-terrace/ Semi-detached bungalow – stepped & staggered



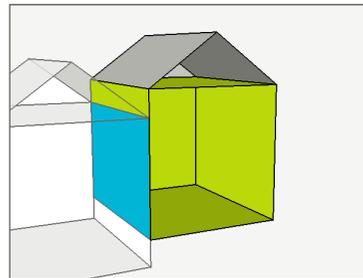
End-terrace/ Semi-detached FOG - stepped



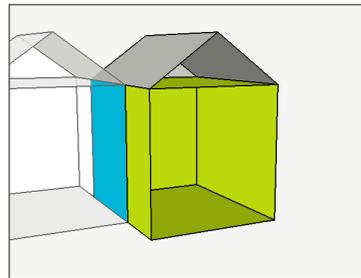
End-terrace/ Semi-detached FOG - staggered



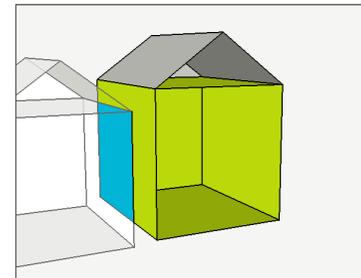
End-terrace/ Semi-detached FOG – stepped & staggered



End-terrace/ Semi-detached house - stepped



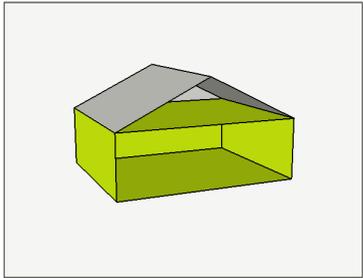
End-terrace/ Semi-detached house - staggered



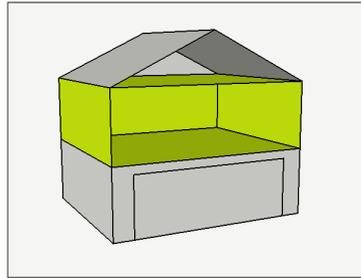
End-terrace/ Semi-detached house – stepped & staggered

Upper limit – Detached houses & FOGs (52 for 'Interim FEE'; 46 for 'Full FEES')

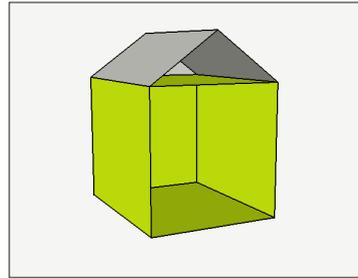
This applies to all detached dwellings.



Detached bungalow



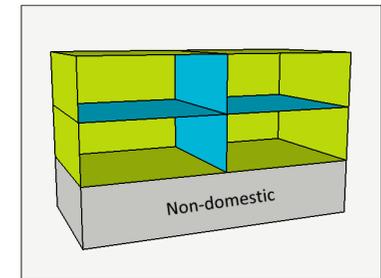
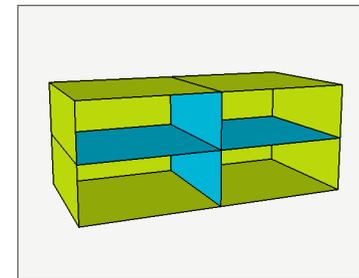
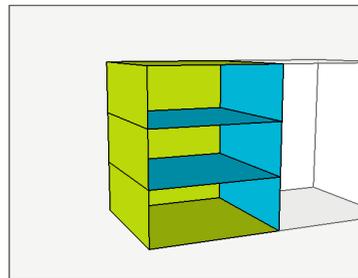
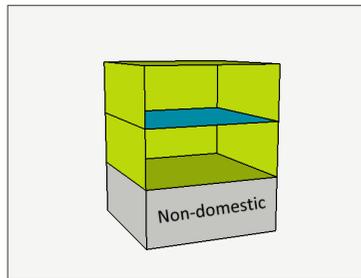
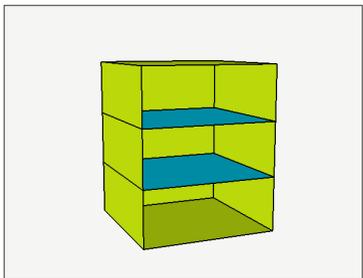
Detached FOG



Detached house

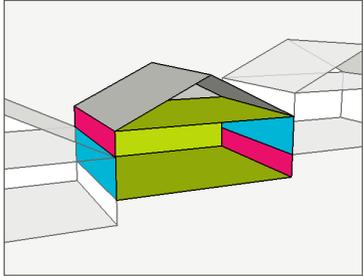
Upper limit – Apartments (52 for 'Interim FEE'; 46 for 'Full FEES')

This applies to all apartment blocks which have one dwelling per floor and have similar heat-loss characteristics to detached or semi-detached houses, and standalone blocks which have two units per floor (i.e. have similar heat-loss characteristics to a pair of semi-detached houses).

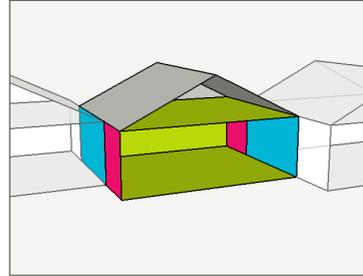


Sliding scale (52-43 for 'Interim FEE'; 46-39 for 'Full FEES')

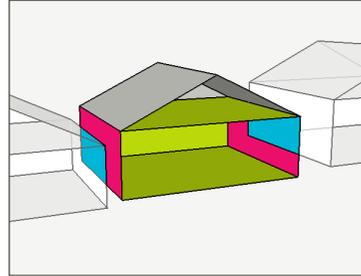
This applies to all mid-terrace houses that have a proportion of side walls adjacent to unheated spaces. Refer to page 5 for explanation of how to calculate the TFEE in these cases. The illustrations below show some common examples of where this would apply. It is not mandatory to use the 'sliding scale' - the lower limit can be used.



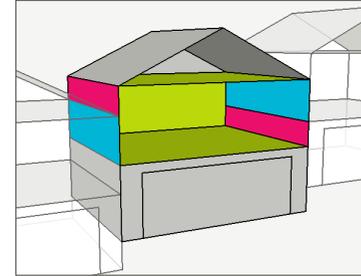
Mid-terrace bungalow - stepped



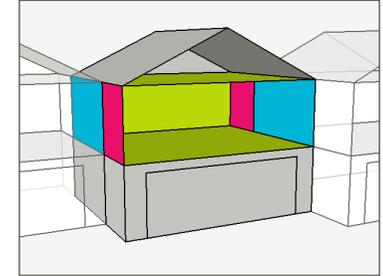
Mid-terrace bungalow - staggered



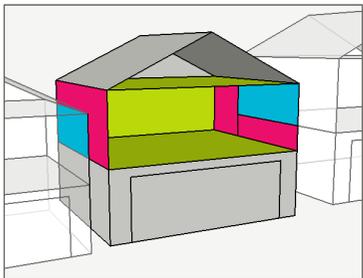
Mid-terrace bungalow - stepped & staggered



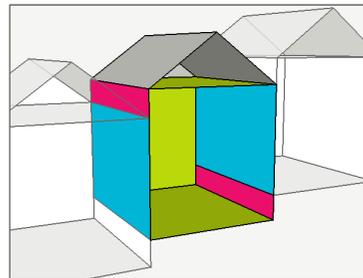
Mid-terrace FOG - stepped



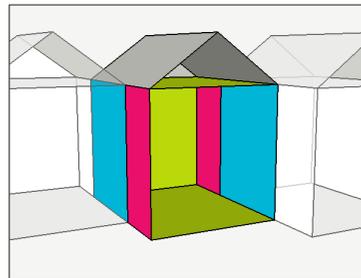
Mid-terrace FOG - staggered



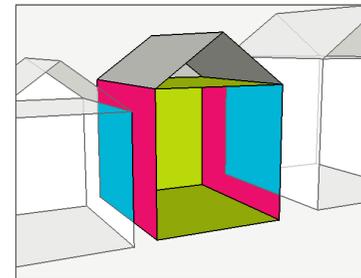
Mid-terrace FOG - stepped & staggered



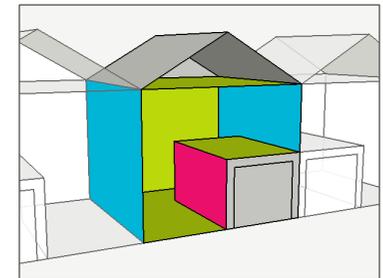
Mid-terrace house - stepped



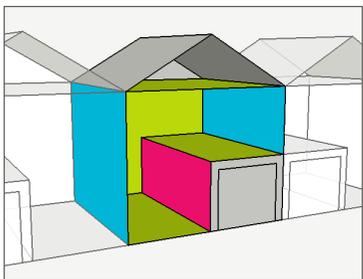
Mid-terrace house - staggered



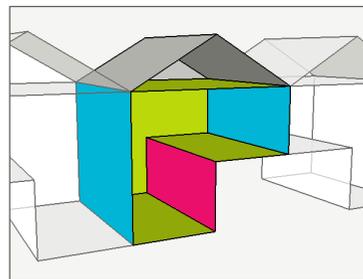
Mid-terrace house - stepped & staggered



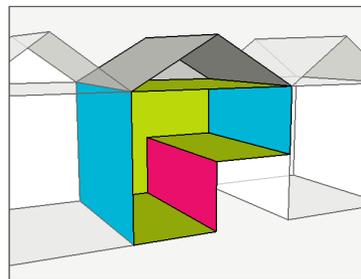
Mid-terrace house with integral garage (not full length)



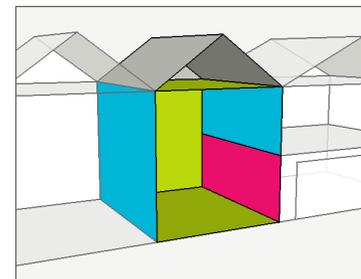
Mid-terrace house with integral garage (full length)



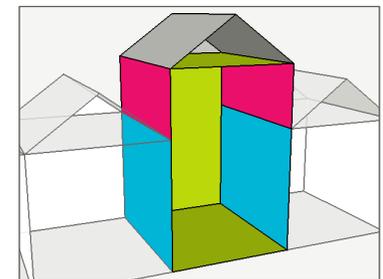
Mid-terrace house with drive-through



Mid-terrace house adjoining access passage



Mid-terrace house adjoining FOG



3-storey mid-terrace house adjoining 2-storey houses

Further development of the FEE methodology

As part of the 2012 DCLG consultation on Building Regulations Part L, the FEE methodology is discussed and the following statement made:

The Hub have acknowledged that there is further work to do on their proposed fabric energy efficiency targets. Recent modelling indicates that some building types may struggle to meet these standards, and setting mandatory limits could mean these buildings would only be able to do so at considerable cost. An example of this is detached bungalows, which can have relatively high heat loss due to high exposed surface area per unit volume. There are also complications to meeting the standards on certain awkward sites, and some dwelling types which defy neat categorisation (e.g. a terrace built on a slope, in which houses have a higher exposed wall area than those in a terrace built on flat ground).⁹

There is now some experience within the industry of designing and building to the FEE methodology, especially with its adoption within the Code for Sustainable Homes November 2010 version. The Zero Carbon Hub would like to gather feedback on the strategies and specifications devised from those who have targeted specific FEE levels, as part of their commitment to a workable definition of zero carbon homes. As well as general feedback on the ease or otherwise of designing to the standard, specific thoughts on the following aspects would be appreciated:

When initially conceived, the industry Task Group considered that all dwellings would fall into one of two categories (i.e. the upper and lower limits). This was subsequently adjusted such that a 'sliding scale' was applicable to certain mid-terrace units. Would there be a benefit in the methodology being implemented as a fully sliding scale – i.e. a methodology which takes an alternate approach to dwelling type classification (although still utilising the upper and lower limits as bounds for the scale)? If so, on what basis should it be defined - are there certain dwelling characteristics that could be used (e.g. a ratio of particular areas like internal floor area and heat loss surface area)? How might this work in practice – from the point of view of both designers and assessors, and the inclusion within calculation tools?

Where building averaging across a terrace is applied and the terrace includes mid-terrace units that are assessed on the 'sliding scale', in effect the TFEE could be adjusted twice; once on the sliding scale between the lower and upper limits and then again for the average TFEE value across that particular terrace. This double-adjustment would be optional, not mandatory. How would this affect, the process of determining an optimum fabric specification, and also carrying out the calculations?

⁹ DCLG, 2012 consultation on changes to the Building Regulations in England – Section two: Part L (conservation of fuel and power), January 2012, Paragraph 56

Is there any benefit in two stages of adjustment or would the allowance of only one method be sufficient? If so, is there a preference between the use of the 'sliding scale' or terrace averaging?

Does further consideration need to be made for the standards for apartment blocks? For example for blocks which are stepped or where a considerable proportion of exposed/ semi-exposed areas exist.

Please send feedback to FEES@zerocarbonhub.org by 27th April 2012.

Responses will be considered alongside feedback gathered via the 2012 DCLG Part L consultation on the potential introduction of fabric energy efficiency standards within the Building Regulations, and the appropriate metrics for those standards.

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