## Introduction

BRE's Excess Cold Calculator is a web-based tool to assist in judgements of whether a dwelling is likely to suffer from an Excess Cold Hazard. To use it, a survey of the dwelling and its occupants should be undertaken and the details of the case entered into the tool. The calculator then estimates running costs and contrasts the required and actual output of the heating system in each room, allowing heating system adequacy to be assessed. The calculation can then be re-run with potential modifications to help in the appraisal of any proposed remedial work.

## **Getting started**

When you first enter the site you will arrive at the home page. This gives a brief introduction to the tool and provides links to other basic information, such as the terms of conditions relating to the use of the site. However, before being able to access the site fully and start assessing your cases you need to be logged in, so the first thing to do is click on the 'Self registration' button near the top right-hand corner.

#### Registration

To register simply enter your name, email address and password in the boxes then click 'Mail confirmation'. Within a few minutes you should receive an email asking you to confirm you want to register and that you accept the terms and conditions. If this email fails to arrive, please check your junk mail folder. Click on the link in the email to complete your registration.

Once you are registered, whenever you want to use the site click on 'Login' at the top of the home page. You will then see the full content of the site

#### Site navigation and features

When you are logged in and arrive at the home page you will see a number of items you can click on to take you to various parts of the site – some at the top of the page and some over to the right-hand side.

To the right you will see that the first link is 'Home'. This appears on every page and simply provides a quick way to get back to the home page when required. The next link, 'Assessor details', allows you to edit the details you entered when registering and add your address and other information. We recommend completing these extra items so they can appear automatically on your reports.

The third link on the right-hand side is 'My cases'. Clicking here takes you to a list of all the cases you have previously entered and offers basic filtering and search features, which will become useful once you have a large number of cases. For example if you know the first part of the post code, you can enter it and click on 'filter' – the list will then show only the matching cases. Of course, initially you will have no cases. The fourth link, 'New case', is where you will need to go when you start entering your first case. (The process for starting a new case is described in the next section of this guide.)

Before starting a new project it is recommended that you read this user guide fully and have a look through the FAQs (frequently asked questions) page. The former is accessed through the 'Downloads' link, where other

supporting documents may be added in future. The latter has its own 'FAQs' link. This list will be added to as new FAQs arise, so remember to check it occasionally for useful information.

Most of the remaining links at the top of the page are self-explanatory, or are duplicates of those described above, but the following are worth noting.

The 'News' link will be updated with announcements from time to time, for example regarding any planned changes to the site.

The 'Contact us' link can be used to ask for assistance, report errors or suggest improvements. This generates a message that is sent to the development team's mailbox for attention.

And finally, clicking on 'Links' takes you to a page containing links to other web-sites that may be relevant or helpful to users of this site.

#### Starting a new case

When you click on the 'New case' button on the home page you will be able to choose from three approaches to creating cases.

- 1. Enter all the information from scratch
- 2. Duplicate an existing similar project, then edit it to match your case
- 3. Start from one of the template files provided, then edit it to match your case

When you first use the tool, to familiarise yourself with the process, it is recommended that you start by using one of the templates to create a test case. But, later, all 3 approaches are likely to be useful in particular circumstances.

To start from scratch, simply enter a case name (e.g. the 1<sup>st</sup> line of the address, but this can be anything you like) and click on 'Create'.

To start from a duplication of an existing project, click on the drop down menu and choose the project that most closely matches your new case, then click 'Duplicate'.

To start from a template, click on one of the templates provided towards the bottom of the page.

Whichever of the three approaches you have used, you will then be taken to the data inputs page.

## **Data inputs**

You will not find a 'save' button anywhere on the data inputs page. What you type is uploaded as you enter it to a secure server, which is backed-up rigorously. From the moment you have entered any input it is effectively saved.

Some earlier inputs affect the choices presented in later ones so it is advisable to enter items in the order they appear, at least until you are familiar with these interactions.

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Data inputs are grouped into several sections. Once a section has been completed you can 'collapse' the section by clicking on the [+/-] icon on the section heading bar – this can be particularly helpful when you want to have the U-value calculators next to the U-value inputs (these are described later). A description of the inputs in each section and any conventions on their collection and entry are provided next.

#### **Case status**

When a brand new case is created the Case Status section will indicate that items need to filled-in before the assessment can be run. When all the required items have been filled-in this text will be replaced by a clickable button entitled 'View Results', which runs the calculation and takes you to the results page. If you are sure you have entered all required items and the 'View results' button has not appeared, try pressing F5 to refresh the page.

The 'Open previous PDF' button also appears in this section. This allows you to view the results from previously run versions of this case.

#### **General parameters**

Allow sharing of case

Allowing a case to be shared means that it can be easily recreated (for viewing, editing, or to be used as a template) by other users. If you choose to make a case sharable then a sharing link and bar code will be printed on the last page of the report. By following the link, scanning the code or entering the report number into the 'Import a Case' section of the 'New Case' page the case will be recreated. Importing a case that was created by a user from your own local authority or company will import all the case details. Importing a case that was created by someone outside your local authority or company means that identifying details, such as the address, will be removed to preserve anonymity.

#### Case name

The case name can be anything that helps you identify the dwelling (for example the 1<sup>st</sup> line of the address), however it should be unique. If you have created a project by duplicating an existing one, or from a template, make sure you change the name at this point.

#### Address and post code

Enter the first and any subsequent lines of the address in the boxes provided. Only the first line must be filled in. The postal town and post code are also required inputs.

#### Weather region

The region of the country in which the dwelling is located dictates which weather data is used by the tool to calculate fuel costs. This isn't linked to the postal address entered previously, so must be selected here.

#### Related party disclosure

Since the assessment may be used in a legal or quasi-legal context, it is important to record whether the person making the assessment has any interest in the dwelling being assessed. Choose the most suitable description from the drop-down menu. This is a required input.

#### Inspection date

This is simply the date on which the data being entered was collected. The date and time when the calculation is run is also automatically recorded and included in the results.

#### Property type and property age

These two variables are used for statistical and categorisation purposes. They don't affect the calculation, so if you are not sure of the age just provide your best guess.

### **XCC Assessment Data**

#### Dwelling type

Some different assumptions may be used in the calculation for Houses in Multiple Occupation (HMOs), so this input is used to record the type of dwelling being assessed. If assessing a single dwelling within a HMO, choose 'HMO (single dwelling)'. If you're assessing a whole building containing several units, choose 'HMO (whole building)'. If the dwelling is not a HMO, choose 'Not HMO'.

[You may notice that this makes no difference to the results at present, but we are planning to use different assumptions for different types in future, e.g. regarding appliance and cooker use.]

#### Total floor area

Enter the combined floor area of all storeys of the dwelling being assessed in square metres, calculated using internal measurements, disregarding internal walls and stair cases (i.e. measure as if they were not there). Exclude conservatories, unless they are permanently open to the rest of the dwelling (no separating door), or are heated by the main heating system. Exclude porches if they protrude from the building, unless they are heated by the main heating system. Store rooms and utility rooms should be included if they are accessible directly from the occupied area of the dwelling, whether heated or not. Basements, attics and garages should be included only if they are heated, or if they are permanently open to the rest of the dwelling (e.g. by a fixed staircase).

The intention is to include parts of the dwelling that the occupant is paying to heat, either directly, or via air movement from adjacent rooms.

#### Dwelling volume

Enter the volume of the dwelling being assessed in cubic metres, calculated using internal measurements, ignoring internal walls, ceiling and floors. Conventions for the inclusion or exclusion of rooms are the same as for floor area (above).

#### Number of habitable rooms

A count of the number of rooms, whether heated or not, excluding kitchens (unless kitchen-diners with room for table and 4 chairs), bathrooms, circulation spaces and store rooms. Living, dining and sleeping rooms are included in the count.

The intention is to include rooms in which people are likely to spend time relaxing and therefore want heated to a reasonable temperature.

#### Number of heated habitable rooms

There are two possible approaches here, depending on what you are looking at. You could enter a count of the number of habitable rooms (as above) that are normally heated in winter by the current occupant(s). However, you might consider that this is not a healthy level of heating (e.g. only heating 1 room properly, leaving other rooms cold and susceptible to damp problems), in which case you might wish to model what you consider to be a reasonable level of heating, where more rooms are heated.

#### Number of occupants

Enter a straight count of number of adults and children who sleep in the dwelling for the majority of the year.

#### Temperature living room heated to

What is entered in this input is determined to some extent by what you are trying to show with your calculation. If you are trying to see how much it would cost to heat this dwelling to a reasonable standard, enter a typical living room temperature here – 21°C is the generally agreed standard, although a vulnerable person could require a higher temperature. On the other hand, if you are trying to estimate the actual running costs based on the (possibly inadequate) heating standard that the occupant uses, you should enter the actual temperature the living room is normally heated to in winter. There are a few possibilities for this:

- If temperature data is available from monitoring, enter the temperature usually achieved in the living room in winter when the heating has been on for a while (typically mid-evening).
- Where this isn't available, if there is a thermostat which controls the heating in the living room enter its setting here. If there is a thermostat in another room, add 3°C to its setting and enter that.
- If there is no thermostat, a spot reading at a time of day and year when the heating has been on for a while would be a useful guide, preferably in addition to a conversation with the occupant (is this the normal temperature in your home?).

You may be interested to know to what temperature this dwelling could be heated for a given budget (e.g. 10% of the household's income). In that case the temperature and number of rooms heated should be adjusted and the results re-run until the running costs are at the chosen level. (Since there are a number of ways of achieving this, it isn't easy to automate this process.)

#### Areas of heat loss elements

This section of inputs is used to calculate the rate at which the dwelling loses heat through its <u>external</u> building fabric. It is therefore important to remember that internal walls, floors and ceilings within the same dwelling are not relevant here.

You only need to enter data for the parts of the dwelling that were included earlier in working out the floor area and volume. For example, if it was determined earlier that the porch was not part of the floor area, the calculation of heat loss areas would be undertaken as though the porch was not present at all.

<sup>&</sup>lt;sup>1</sup> Radiators are roughly sized to heat the other rooms to 18°C when the living room is at 21°C, a difference of 3°C.



For some items, two boxes are provided. For example the area of two wall types can be entered. This is useful where there has been an extension built later than the original dwelling using a different wall type, which is likely to have a different U-value (see next section).

#### Wall area

Enter the area of external walls in square metres, calculated using internal measurements. Enter <u>gross</u> areas (i.e. don't subtract window and door areas – the software will adjust for this).

#### Floor area

Enter the area of external floors, either on the ground or above other external spaces (e.g. over driveway) in square metres, calculated using internal measurements.

#### Roof area

Enter the area of external roofs/ceilings separating the dwelling from the external environment in square metres, calculated using internal measurements. Enter <u>gross</u> areas (i.e. don't subtract roof window area – the software will adjust for this).

#### Party wall area

A party wall is a wall separating one dwelling from a neighbouring dwelling. Usually the neighbouring dwelling is assumed to be heated to a similar standard, so there should be little heat loss by conduction to it. However, if the party wall is of cavity construction, air movement through the cavity may lead to some heat loss from both dwellings. Enter the area of the wall between the dwelling and any neighbouring dwellings here. Only enter the area of the section separating the heating part of the dwellings (e.g. don't include the area between unheated lofts).

It is good practice to enter a value here even if the party wall is not of cavity construction in case it is later found that the neighbouring dwelling is uninhabited.

#### Window area

Enter the total area (including glass and frame – i.e. the area of the 'hole in the wall') of all windows of the same type in square metres. Also include the area of glazed doors (e.g. patio doors), which are treated as windows for calculation purposes. If there are two types of windows (e.g. some single and some double), use the 'window type' 2 box for one of them so they can be assigned different U-values.

Roof windows have their own input.

#### Door area

Enter the area of all external doors in square metres. However, count doors which are more than 50% glazed as windows instead (see above) – don't enter them here. Doors are usually around 2m<sup>2</sup> in area, so if you only know the number of doors, multiply by 2 to get the approximate area.

#### Doors to unheated spaces

Enter the area of any doors between the dwelling and an unheated internal space not within the dwelling (e.g. an unheated stairwell in a block of flats) in square metres.

#### Other external elements

Enter the area of any other external walls, floors or roofs in square metres, measured internally. Use this option as a last resort where both wall, floor or roof inputs have already been used and there is a third type, entering the smallest of the three as 'other external element'.

#### Heat loss to internal (unheated) space

Enter the area of a wall, floor or roof adjacent to an unheated but sheltered space not within the dwelling (e.g. an unheated stairwell in a block of flats) in square metres, measured internally. If this is a wall containing a door, in this case subtract the door area and enter the <u>net</u> value (note that this is different to the external wall areas entered previously – see above).

#### U-values

A U-value is a number used to describe how fast heat travels through a material. A lower U-value means heat travels through it more slowly, so is therefore better in terms of warmth and heating costs.

A U-value is required for each heat loss element for which you have entered an area in order to determine the rate at which heat will be lost from the whole dwelling. Ideally this would be calculated<sup>2</sup> specifically for each element. However, there are a number of construction types which are commonly found for which standard values will normally suffice. To help with this, several U-value estimation tools are provided to help you calculate suitable figures for a variety of typical walls, floors, roofs, windows and doors. These can be found to the right of the input area in the section called 'U-value help'. Use the drop down menus to describe the element, using the closest matching category to obtain the estimated U-value.

The U-value help tools assume the structure is sound. If it is damaged or incomplete, allowing air/water to penetrate the structure, or if it is unusually damp, these typical figures may not give a reliable estimate.

#### Air change rate

Enter the air change rate for the whole dwelling in air changes per hour (ach). A typical value for a UK dwelling is about 0.75 ach, but it can be considerably higher in some cases, especially where window and door frames

<sup>&</sup>lt;sup>2</sup> It is also possible to measure the U-value of building components, but this requires specialist equipment and around 2 weeks of monitoring carried out during cold weather, so is unlikely to be a practical option.

are in a poor state of repair. Use the calculator tool to the right of the input area to help determine a suitable value.

#### Main heating fuel

Select the fuel used by the heating system which heats the largest portion of the dwelling. If there are two systems which each heat roughly half of the dwelling choose the one which heats the living room.

In some cases occupants may decide to turn off their central heating and use one or more room heaters to avoid spending money heating the whole dwelling. Depending on what you are trying to show, you can choose to model the dwelling in this way by ignoring the central heating system and selecting a room heater as the main heating system (having adjusted the main heating fuel first if necessary). Alternatively you may wish to model what would be a reasonable level of heating in the dwelling, in which case selecting the central heating system would be more appropriate. This should be consistent with the number of heated rooms entered earlier.

#### Main heating type

Using the drop-down menu, choose the closest description of the main heating system. Note that the list changes depending on what main heating fuel you have chosen, so if the options do not look right, please check the fuel type is correct. In rare cases, if there is a short internet outage, this list may fail to update when you change the heating fuel, in which case press F5 to refresh the page.

You may come across electric heaters which manufacturers claim to be more efficient than normal, with names such as 'smart' or 'intelligent'. Regardless of manufacturer's claims<sup>3</sup>, any electric heater that is not a storage heater should be treated as an 'Electric fire'.

#### SEDBUK 2009 efficiency

The efficiency of most gas, LPG and oil boilers is listed in the UK's Boiler Efficiency Database (a link to the website is provided beneath the input box). If data is available for the make and model of boiler present in the dwelling, enter the 'SAP 2009 annual efficiency' figure from the database here. If unknown, leave this box blank – a typical default will be used.

Note that this box is only available if you have chosen a gas, LPG or oil boiler as the main heating type. Other heating types are not contained in the SEDBUK database, so typical defaults are always used.

#### Secondary heating type

Choose from the drop-down list the best description of any secondary heating that is used. If none is present, or none is used, select 'None / not used'. In most cases it is very difficult to determine what proportion of a dwelling's heat is provided by a secondary system so typical defaults are assumed based on the main and secondary heating types.

<sup>&</sup>lt;sup>3</sup> With exception of electric heat pumps, all electric heating is already assumed to be 100% efficient at the point of use so claims of greater efficiency are implausible.

#### Water heating type

Select the closest description of the main water heating system from the options in the drop-down list. The water heating options change depending on the main heating system selected, so if you can't find the system you were expecting please check the main heating fuel and type are correct.

#### Hot water cylinder insulation

Choose a description of how well insulated the cylinder is. Choose 'some' if an originally bare cylinder has been fitted with a 'jacket' of up to 40mm thickness. If a thicker jacket is used, or the cylinder is factory insulated, choose 'good'.

#### Fuel prices

If you know the actual fuel prices in this dwelling based on bill data, fuel delivery receipts/invoices, or some other reliable source, enter them in the relevant boxes in the fuel prices section. If any fuel prices are unknown, leave them blank – a typical default will be used. Prices are entered on the basis of there being an annual standing charge (which can be zero) and a unit price (in pence per kWh). For help converting tiered tariffs to an equivalent standing charge and unit price, use the 'Tiered tariff help' tool to the right of the input area.

In some cases you may need to convert from other price units to p/kWh - e.g. wood may be charged for in £/tonne. A help tool is provided to the right of the input area to help with this conversion.

#### Room data assessment

Inputs in the Room Data assessment section are used to consider the adequacy of the heating systems supplied in each room – they do not affect the assessment of the energy consumption and fuel costs of the whole dwelling. If only the running costs are of interest there is in fact no need to enter data in this section.

Where an assessment is required of the adequacy of the heating supplied in individual rooms the relevant inputs in the Room Data assessment section should be entered (as described below) for each room of interest. There is no requirement to enter data for every room in the dwelling.

Initially inputs are provided to enter data for only one room. If more rooms are to be assessed, click on the 'Add another room' button at the top of the Room Data section.

#### Room name

Enter any name which helps you identify the room. This is how it will be labelled on the results page.

#### Volume

Enter the volume of the room in cubic metres, measured internally.

#### Air change rate

Enter the air change rate for the room in air changes per hour. This is likely to differ from the figure for the whole dwelling which you entered earlier, and is likely to differ from room to room. Suggested values are:

- well-sealed = 0.5 ach
- typical = 0.75 ach
- draughty = 1.0 ach
- very draughty = 1.5 ach

Add a further 1.0 ach if the room is a bathroom or a kitchen, where additional deliberate ventilation is likely. Add a further 2.0 ach if the room has a functioning chimney.

#### Heat loss areas and U-values

Enter the area and U-value of any structure that separates the dwelling from the outside air (or ground in the case of floors) in the boxes under the heading 'Heat loss elements bordering the external environment'. The U-value help tools described earlier will again be of use here. All areas should be measured internally.

There is also a second section of inputs entitled 'Heat loss elements bordering an unheated internal space', which can be used to describe any areas of heat loss to adjacent unheated spaces not within the dwelling, such as an unheated stairwell in a block of flats. The U-values of such internal walls, floors and ceilings are generally not the same as external ones, so look for the internal values provided in the U-value help tools.

#### Internal room temperature

Enter the temperature that it would be reasonable to expect this room to be heated to. Guidance values used by heating system designers are 21°C for living rooms, 22°C for bathrooms and 18°C for bedrooms, dining rooms and other rooms.

Temperature of unheated internal space on a cold day

This refers to the temperature on a cold day (see next item) in an adjacent internal but unheated space not within the same dwelling to which the dwelling is losing heat, such as an unheated stairwell in a block of flats. This only needs to be entered if you have already entered a heat loss area and U-value to an unheated internal space. Unless you have evidence from measurements assume this is half way between the internal and external temperature (e.g. 21 indoors, -3 outdoors, half way between = 9°C).

Cold day temperature for design heat loss

Enter a temperature that represents the lowest external temperature<sup>4</sup> at which the heating system can reasonably be expected to adequately heat the dwelling (e.g. one exceeded 99% of the time in the past). This is commonly set to -3°C by heating system designers, although a lower figure would be appropriate if assessing a home in particularly cold part of the UK.

#### **Radiator dimensions**

Enter the basic measurements (height and length) of any radiators present in the room. Leave this input blank if no radiators are present, unless you wish to investigate this as a possible improvement option.

<sup>&</sup>lt;sup>4</sup> Note that is should represent a 24 hour average temperature, not a minimum night time temperature.

#### Radiator type

Choose the closest description of the radiator type present from the drop-down list.

Radiator temperature

This is normally determined by the boiler thermostat setting – use this value if possible. If this is unknown, use 65°C.

### Obtaining and interpreting the results

Once all the required input data is entered a 'View Results' button will appear in the Project Status area near the top of the data inputs page. If it has failed to appear and you have entered all the required data, try pressing F5 to refresh the page. Clicking on 'View Results' runs the calculation and takes you to a new page where the results are presented.

If you want to go back to the inputs page, use the 'Back to project details' button in preference to the 'back' option in your browser to avoid possible problems.

If you would like to save or print the results then use the 'PDF report' button to open a PDF version of the results. This will include all the tables and graphs from the results page with explanatory text to introduce each section. In an appendix all the input parameters for this case are given, allowing you to keep track of changes made (for example, when running a case multiple times to investigate improvement options).

#### Case details

The first item reported on the results page is a quick summary of the case details, such as the name, address and postcode.

#### Annual energy costs

The next section presents the calculated running costs in the form of a table and graph. The key thing to note about this data is that <u>only the first column represents the dwelling exactly as you described in the inputs</u> <u>section</u>. The other columns represent the same dwelling but with different heating systems. This provides a quick comparison to show the difference the heating system makes. Note that some of these alternatives may in practice be impossible (e.g. gas heating, where not on the gas network), so they are just shown for information.

Looking again at the first column in the graph and table, you will see that the running costs are divided into several categories, followed by the total, allowing you to sum the appropriate parts for your purposes. The individual components represent the fuel costs associated with that end-use for a typical year and assume the occupants use hot water and appliances in a typical way – in practice there can be considerable variation depending on individual habits.

Two horizontal lines are shown on the graph. The lower line is set at 10% of the minimum guarantee element of 'pension credit' for a single pensioner, i.e. 10% of the minimum annual income single pensioners should normally receive. The higher line is the equivalent figure for pensioner couples. The need to spend more than 10% of income on fuel is no longer an official threshold for determining fuel poverty, but you may still find these benchmarks useful.

The final row of the table shows an <u>approximate</u> SAP rating. <u>This is not an official SAP rating</u> because it has been generated from a much smaller data set than is normally used. We would however expect the value shown to be within 5 SAP points of the true value in most cases<sup>5</sup>. In referring to it, be careful not to imply that it is a 'proper' SAP rating – describe it as 'approximate' or 'indicative'.

#### Annual energy consumption

The energy consumption table and graph present this data in a similar way to the fuel costs. Again, the first column represents the dwelling as it is and the others show how the energy consumption would differ with various alternative heating systems.

#### Annual CO<sub>2</sub> emissions

The  $CO_2$  emissions associated with the dwelling's energy consumption are presented next in the same format, for information.

#### Modelled mean internal temperatures

As part of the calculation of energy consumption and running costs it is necessary to estimate the average internal temperature for each month of the year in order to estimate the rate of heat loss from the dwelling. The figures used are reported in a table and graph, giving separate figures for the living room, the rest of the heated dwelling and the whole dwelling (including all rooms, whether heated or unheated). If in your inputs you stated that several habitable rooms were unheated, you may see a significant difference between the temperature in the living room and the whole dwelling in the winter months. If you indicated that there was only a single heated habitable room then this is the living room (the living room must always be heated) and the line for 'rest of the heated dwelling' will not be shown on the graph.

The summer temperatures are not to be relied upon since the calculation operates on the basis of their being a heating requirement. Hence, they would not be useful for estimating the risk of summer overheating.

Neither the winter nor summer figures attempt to represent extremes of temperature – they are <u>monthly</u> <u>averages</u> for an average weather year. On individual cold days internal temperatures could fall much lower.

#### Heat losses

The next section shows where the dwelling is losing heat, which can be helpful when considering possible ways to reduce running costs. This is measured by the 'heat transfer coefficient' for each element type (walls, floors, etc.). This quantity represents the rate at which the element conducts heat from the inside to the outside of the dwelling, so lower is better in terms of warmth and running costs.

<sup>&</sup>lt;sup>5</sup> An example of where this would not be the case is where a dwelling has electricity generating 'photovoltaic' panels installed, which is not an input in the Excess Cold Calculator. A medium sized PV installation would add around 10 SAP points so the difference between this tool and an official SAP rating in that case would probably exceed 5 points.

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There is one category reported that you may not be familiar with: 'Thermal bridges'. These are areas of higher heat loss found around the edges of the main building elements and at junctions between them, for example at the reveals and sills around windows. Good design can minimise these in new buildings, but it is generally hard to reduce them in existing homes except during major renovation, so you will find this source of loss persists even when improvements to the dwelling fabric are modelled.

Heating data for individual rooms

The final area on the results sheet shows data about the heating adequacy for any rooms assessed. This area will show no information if no room data was entered in the 'Room data assessment' of the input page.

The 'design heat loss' is an indication of how much heat is required to maintain the chosen internal temperature on a cold day. This helps to decide what size of heater or radiator would be required to heat this room. If you input the actual radiator sizes for the room, you will be able to see if the radiator output is less than the design heat loss, indicating that the occupant may be unable to heat the room to the required temperature on a cold day.

The final column contains an estimate of the size of storage heater that would be required to adequately heat the room, which can be compared to what is actually present, where known, in order to assess whether it is adequate.

When making the assessment of heating adequacy, any secondary systems present should also be considered. For example, storage heaters are often deliberately sized to meet 85% of the load, with an (on-peak) electric fire provided to meet the remainder. Therefore, providing a functional alternative system is present, a storage heater apparently 15% under-sized may in fact be adequate.

## **Further help**

Information about updates and other items of interest will be added to the 'News' page from time to time.

The FAQs page will be updated as questions arise, so it would be worth checking from time to time.

If you get stuck or have any suggestions for how the site can be improved, please use the feedback link, which is at the top of every page.

In future we will consider adding a 'forum' facility to allow users to share ideas on the use of the site.