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Architectural Research Unit
and 55° North Architecture

Guidance For Living in a Low Carbon Home

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- Homes for Scotland
- Property Logbook Company
- John Gilbert Architects
- Architects Journal - Footprint
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- Stewart Milne Group
- Oliver and Robb Architects
- BPTW Partnership
- Family Mosaic
- Osbourne Homes
- Useable Buildings Trust
- CIC Start Online
- Devereux Architects
- Hockerton Housing Project

The opinions expressed in this report are those of the authors.

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1. Executive Summary

This project was commissioned by Building Standards Division (BSD) in November 2010 and was undertaken by the Mackintosh Environmental Architecture Research Unit and 55^o North Architecture between December 2010 and February 2011.

The scope of this project was to undertake initial investigations into the development of a guidance document and related information for occupants of low energy homes, which could be included in building regulations to support sustainability within the Scottish Building Standards. The project aimed to develop appropriate ideas and produce an effective set of mechanisms for communicating these to occupants.

Based on this research and testing, the report identifies a number of findings:

- Include user information in a voluntary higher level of optimising performance within Section 7 sustainability of the Technical Handbooks
- The adoption of a 'quick start guide' format to include:
 - associated minimum information requirements
 - specification of key sections and content
 - graphic standards
- Require the quick start guide to signpost other important documentation such as appliance manuals
- Require the quick start guide to be specific to each house
- Require a draft document at building warrant with a final version at completion stage
- No specific format should be specified, but a range of options are identified (an example document is included within the report)
- Additional requirements for the applicant at handover could include direct labelling of key installed items (such as heating programmers)
- Scope exists to augment written guidance with other electronic media such as videos hosted online
- Direct demonstrations or walk-thrus of new homes are useful but are difficult to verify as part of the building warrant process.

2. Introduction

This project was commissioned by Building Standards Division (BSD) in November 2010.

BSD have developed a new section 7 that aims to encourage more sustainable design and construction for all new buildings by defining optional higher levels of sustainability within building standards.

During the development of guidance for this new standard the requirement to provide concise information on 'how your home works' for occupants of new buildings was identified.

The first part of the project was undertaken between November 2010 and January 2011, and involved the collation of existing information and analysis of the data to identify best practice. The second part used this information to develop proposals for simple, effective guidance for occupants that could be included in building standards.

The relatively short timescale of the project limited the amount of data that could be collected, nevertheless a suitable range of material was found. Whilst some good examples of types of information were seen, there was no single exemplary document that met the full requirements of this brief.

After analysis of this data, further work was undertaken to identify the nature of the essential information that would be required in the guidance. The fundamental principle was that to be effective the information should be simple, easy to absorb and lead to, rather than provide, detailed guidance. This led to the development of a series of core headings that needed to be covered in the document.

These principles were tested through the development of sample guidance for some prototypical housing, resulting in the production of an example booklet which was examined by stakeholders in a workshop in January 2011.

Following discussions with workshop participants, information providers, other stakeholders and BSD, a template with guidance notes for the guide has been produced as the output from this project.

The following sections discuss the literature review and related research; key issues and examples of best practice that emerged from this; the development of the specification for the guidance and workshop feedback; and the final requirements for the guidance content in both general and specific content areas.

3. Literature Review

Information was sought from a wide range of stakeholders, including social housing providers, private developers, housebuilders, research and academic organisations, tenants groups and landlords. Information was also collected from books, websites and other media. This information is provided in Annex A. This review details instances of useful reference and best practice in providing instructions for the operation of energy systems within homes or operation of low carbon technology. Many respondents provided information in confidence and so are not identified in the report.



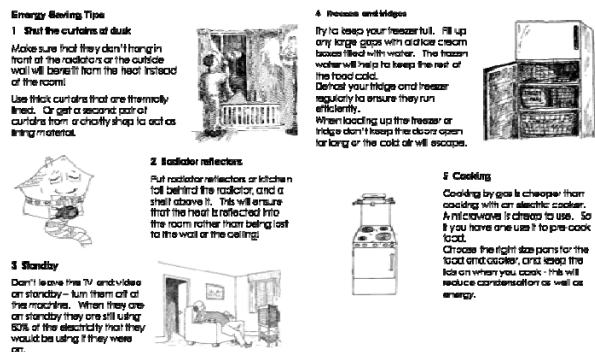
Use of logos and colour to make the guide easy to read (www.spongenet.org/)



Use of graphics and dos and don'ts to explain ideas simply (Gentoo Housing)



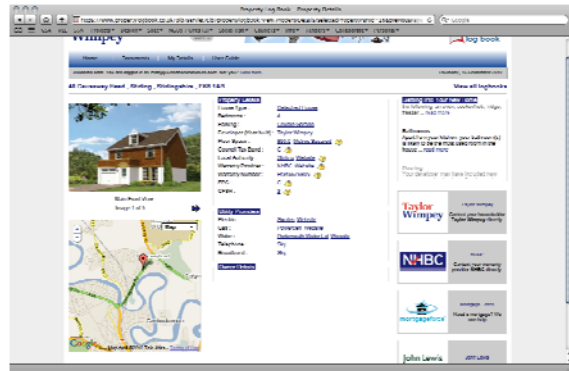
DVD showing use of various systems (bptw partnership)



Energy saving advice linked to specific aspects of the house. (Rickaby Thompson Associates)

Firstly some basic guidelines:

1. Use rugs rather than carpet on the ground floor;
2. Do not enter the loft space or store anything up there; storage space is available over the shower room, under the stairs and in the porch;
3. Close the sunspace doors to the house when it gets colder than the house, unless you want to lose heat;
4. On sunny days, especially in colder months, open these doors to get the heat in from the sunspace;
5. If it is cold outside, avoid having the front door and internal porch door open at the same time;
6. Only turn the towel rail in the shower room on if you are using it regularly;
7. Programme the heaters and towel rails to suit your needs;
8. Avoid opening windows in colder months. The ventilation system will bring in fresh air and extract moisture without losing valuable heat.



Quick Start information and tips for using the appliances in a short format right at the front.
(Hockerton Housing Partnership)

Web based information and manual storage
(Property Logbook Company)

Code for Sustainable Homes (CSH) criteria

This is a points based system and points are available under CSH for supplying a resident's handbook with each house. It must cover the following aspects:

Operation issues:

- Environmental strategy
- Energy
- Water Use
- Recycling and waste
- Sustainable DIY
- Emergency contact numbers
- Links and further information

Site Issues:

- Waste and recycling
- SUDS
- Public transport
- Local amenities
- Responsible purchasing

Whilst the system expects a 'non technical' guide, there is no standard format for this information. Social Housing example number 3, below, meets CSH criteria. They generally have over 30 pages of information, which was thought to be too much for users to easily comprehend.

Ecohomes Criteria

This is a points based system and points are available under Ecohomes assessments for supplying a resident's handbook with each house. They must cover the same categories as the Code for Sustainable Homes but with different criteria.

Whilst the system expects a 'non technical' guide, there is no standard format for this information. Social housing example number 8, below, meets Ecohomes criteria.

Homes And Communities Agency (HCA) Guidance

As part of the HCA standards there is a requirement to communicate to residents the efficient and safe operation of heating and hot water system.

'Sponge' Buyers Guide to a Greener Home

This document is aimed at persuading new homebuyers to consider the sustainable aspects of their new home. Published in 2008, it provides an easy to read overview of sustainability labelling (such as Energy Performance Certificates, Code for Sustainable Homes) and other current issues. It touches on energy use and provides key tips on how to reduce carbon emissions, explaining a number of issues such as air tightness in an accessible, non-technical manner. The logos and the accessible graphics were good (see example illustrated above).

Home Owners Manual - Dan Ramsey and Fix it Club

This is an American book providing operating instructions for homes. It uses clear diagrams, bullet points and easy language to outline how systems work and how to fix them. It was useful as a graphic reference.

Housebuilder Moving In Pack - Example 1

This documentation comprises a guide to buying a home, a copy of the Consumer Code for Housebuilders and their marketing material for the project. Our review showed that this housebuilder undertook a walk round as standard with their new residents and that an after sales service and information is provided as part of the Consumer Code for Housebuilders (but not necessarily on heating systems etc.).

Housebuilder Moving In Pack - Example 2

This housebuilder undertakes a familiarisation visit on the move-in date and residents are handed a pack containing:

- Home user guide
- Emergency information
- National House Building Council (NHBC) Guide to your New Home
- First Aid information
- Operating manuals and warranties specific to the house

The home user guide concentrates on bedding in, maintenance and cosmetic issues. There is reference to the radiator valves but no information on how to operate the different heating and ventilation systems.

The NHBC colour document has key sections on their warranty, 'BuildMark', moving in advice, running your home, essential services, tips, DIY, maintenance and a generic guide to how homes are built. It is a well-balanced document. The information is clear and concise, well illustrated and relevant to new homeowners. The downside of it is that it is generic, concentrating on only current standard construction methods and systems.

Housebuilder Moving In Pack - Example 3

The housebuilder provided a checklist for moving in information, a letter to new residents and a moving in brochure.

The moving in brochure sets out a timetable for a tour of the house on moving in day together with a demonstration of the systems, then a follow up call 7 days after the move-in date. Our research indicates this is good practice.

The guide itself does not outline how to operate any of the systems, simply that the manuals should be supplied and that they should be read. It provides the number of a helpline that can be used if people forget any details after the demonstrations.

It is understood that the housebuilder also provides the NHBC document referred to above.

Housebuilders Moving In Pack - Example 4

Detailed information was received on the evaluation of this experimental house. The main observations on usability were:

- Users need greater time and simplification of information to understand complex low carbon technologies
- The walk-through process was beneficial to occupants understanding
- Support and help phone lines or reminder sessions may assist better use of new technology
- Information on energy saving through behaviour or lifestyle change was highlighted as an area for development
- Simple diagrams and illustrations in handbooks would be helpful.

This is the most detailed case study seen on the user experience of new housing and as such it is considered that some of its recommendations should feature in the best practice.

Developers Moving In Pack - Example 1

This is a residents handbook which outlines the principles of the heating system, how to operate the controller and provides energy saving advice. It is specific to the house and uses a troubleshooter guide to help resolve common issues.

There is perhaps more information here than required for this project but includes good examples of drawings and clear information for residents. The Energy Saving Trust endorses the document. The specific nature of the advice was thought to be good practice.

Developers Moving In Pack - Example 2

This is a guide to a pair of houses that have been refurbished to Passivhaus levels of performance. It has a general introduction with key tips on using the house. It clearly explains the key features with photographic references and detailed instructions on how to use the systems in the houses. It has further dos and don'ts related to reducing the energy use of the house to a minimum.

Social Housing Moving In Pack - Example 1

This project had a significant arts strategy, which was explained to the residents through a moving-in pack containing stickers and stencils as part of the arts programme. Whilst not directly related to how a house works, the idea of stickers and graphics is useful.

Social Housing Moving In Pack - Example 2

This is a two-page A4 sheet on a single aspect of the heating system. It is clear and written in plain English, contains photographs of the key elements and key adjustments required.

This was an excellent example of the level of information required for heating and ventilation systems.

Social Housing Moving In Pack - Example 3

This development has won several awards for architecture and sustainability. A contents page was obtained from the draft handbook. The contents reveal an intention to mirror the requirements for the Code for Sustainable Homes including information on operating the wood chip heating system and the ventilation system.

Social Housing Moving In Pack - Example 4

This is distributed to all residents in the houses and flats who benefit from PV on the roof. There is a single page of text with a non-technical tone. There is no need for much explanation, as it basically says 'do not touch the controls!'

Social Housing Moving In Pack - Example 5

This project is a refurbishment of a traditional tenement block for a social housing provider. It does not cover the heating system or ventilation system and contains a significant amount of technical jargon. It does consider condensation and the causes of condensation but makes no reference to ways of dealing with the problem effectively.

Social Housing Moving In Pack - Example 6

This is information relating to impending kitchen and bathroom refurbishment. This sets out clear checklists for residents to refer to as the work progresses and photos of what is going to happen. It is good practice and applicable to this project.

Social Housing Moving In Pack - Example 7

This handbook has a section entitled 'Energy Saving Advice' that states the location of the EPC, outlines advice for the specific heating system installed, and provides generic advice about heating the house, lighting, hot water generation and appliances.

Whilst it does not give operational instructions, the combination of specific information and generic advice was appealing.

Social Housing Moving In Pack - Example 8

This 34-page document meets the Ecohomes criteria for resident's handbooks. It contains images of the constituent parts of the various systems, an explanation of what they do and basic operation instructions. There are tips on reducing energy use including energy efficient appliances and standard settings for thermostats.

Social Housing Moving In Pack - Example 9

<http://www.youtube.com/watch?v=NF5j6LZ6oJE>

This 5 minute video was issued by DVD to all new tenants of this housing scheme. It gives an overview of the operation of the houses, clear instructions and demonstration for using the heating and ventilation system and information on reducing bills. It is all specifically aimed at the houses involved and uses no technical jargon.

This is considered to be best practice as an alternative means of disseminating information. A screen shot is in the illustrations on page 7.

Passivhaus Moving In Pack - Example 1

This housing development includes a certified Passivhaus (German low energy standard) in Scotland. The document outlines the operation of key aspects of the houses including services, fixtures and fittings, what is around your home, decoration and manufacturers information on the components of the heating system. The handbook is illustrated with hand sketches and photographs that aid identification of the items described.

It does not make specific reference to the houses but is clearly tailored to the development. There is no information on heating and ventilation other than the manufacturers literature and no information on the heating controls.

Passivhaus Moving In Pack - Example 2

This is new build social housing to Passivhaus standard. The document outlines a number of contractual details between the developer and its residents. Central pages have diagrams of generic houses with dos and don'ts in an easy to read style. Having

reviewed all of the other documents in the literature search, the simplicity and the directness of the dos and don'ts section was good, even though it doesn't really address the heating and ventilation systems.

Passivhaus Moving In Pack - Example 3

This is the pack for the first certified Passivhaus house in Fife. The manual outlines the standards that the house design meets and how the technology works (including solar panels, a heat pump and mechanical ventilation). There is a good diagram illustrating the mechanical heat recovery system. This shows the amount of quite complex information that needs to be communicated. There are pictures of each element to aid identification.

Other Research

We have also undertaken the following research:

Variety of user manuals

Other types of user manuals were considered as reference points. A common theme was that in many cases too much information is presented, with the result that little of it is actually read. More successful models were thought to be quick start guides which typically include a graphic description of the key elements (what's in the box), the basic information required for use (getting started), tips for optimum use (dos and don'ts) and where to find further information.

Interview with Dr Fionn Stevenson - Oxford Brookes University

The lack of information and support for new residents generally in new housing was discussed. Several publications were referred to (reviewed below) and there was discussion on the outcomes of various research projects. The key stages identified for successful transfer of home systems information are:

- Walk round and demonstration on move-in day
- Items identified with labels with 'standard' settings
- Supply of a 'quick start guide' covering only the essentials (max 4x A4 pages)
- Supply of manuals and residents handbook for those that want more detail or reference in the future
- Follow up visit and demonstration either 2 weeks after the move-in date, or at the start of the next heating season to ensure understanding of the systems.

Interview with Stewart Young - Property Logbook company

Property logbooks to give long-term online storage of information relevant to homeowners, in response to the problems with current paper based handbooks that can easily be lost. The website allows each homeowner to access tailored information on their property. The framework can accept a wide variety of file types so could be adapted to show a 'quick start guide'. The company stated that clients - generally

volume housebuilders - load up existing information such as EPC's and heating system manuals. We were given access to a sample logbook to assess the system.

It is considered that using a system similar to this has to be considered best practice.

Review of Soft Landings Information

Available on Building Services Research and Information Association (BSRIA) website (<http://www.bsria.co.uk/services/design/soft-landings/>)

The information available on this website has been reviewed including the framework for the soft landings service. BSRIA promote post occupancy evaluation as a key component of soft landings to understand if the building is performing as expected and to help identify changes required. There is also heavy emphasis on documentation and training of users to assist them in understanding how to operate the building effectively.

Soft landings should be considered as best practice for non-domestic situations therefore this area should be addressed in more detail by BSD in taking forward the details of guidance in standard 7.1 for non-domestic buildings.

Usable Buildings Trust

Contact was made with the Usable Buildings Trust and their website contains useful papers and presentations. Their principal recommendations are that providing more user friendly controls and better commissioning would mean that they would be much easier to use correctly.

BSRIA Controls for End Users

This BSRIA paper outlines the characteristics for good systems controls within buildings looking specifically at the design and location of those controls. There is a sense that better design and consideration of control mechanisms would make systems more intuitive and reduce the need for guidance. This could be referred to in the guidance.

4. Key Issues and Best Practice

From the wider review and research undertaken, we have distilled the key aspects of best practice in hand over information for residents of new homes. Notes on each aspect in relation to the potential to work within building standards are added in italics:

Design of buildings and systems that are intuitive for the user and controls that are self explanatory:

- Refer to BSRIA and Usable Buildings Trust promoted approach
- *Specification of controls is beyond the remit of this guidance and Building Standard*

Undertake a walk round of the property and demonstrate the key systems on move-in day:

- Already undertaken by major housebuilders
- Should be formalised as part of process
- Does not provide longevity of information, so should be used as an additional to base guidance
- *The building standards system may not be able to control or evidence this action as it would occur after the warrant has been granted*

Label key devices within the heating, hot water and ventilation system, provide notes on a normal settings:

- Refer to Social Housing Example 1
- *Could be included in the guidance*

Give a quick start guide (about 4 pages A4) for occupants on moving in day and easy reference which:

- Can be read within 5 minutes and for occupants to refer to occasionally
- Includes energy saving tips and advice tailored to the property
- Can be deliverable in other formats e.g. digitally, with similar headings and sections
- This should provide links or signposts to more detailed information, for example appliance manuals, manufacturers websites, etc.
- Refer to Social Housing Example 9
- *Could be included in the guidance*

Second walk round/telephone call 2 weeks after moving in or during the start of the heating season to ensure understanding of the systems:

- Some housebuilders offer this service for defects inspections, and it could be easily expanded to include system installations

- *The building standards system may not be able to control or evidence this action as it would occur after the warrant has been granted*

Offer full manuals and information in either hard copy or preferably on a dedicated site on the internet:

- Housing Associations undertake this routinely with bespoke information for each development
- Developers seem to use NHBC standard information; to be more useful it would need to become more customised for each house type
- Refer to Propertylogbook.co.uk
- *The building standards system could use the existence of this supporting information, but would not have control over content or formatting*

It appears that traditional householder manuals are long and detailed, and feedback suggests that these are rarely read in full and not fully remembered. Based on examples from consumer goods, the quick start guide element is brief and therefore more likely to be used because it gives users information on the key essentials required to use the home. Such a document is therefore more likely to be retained by the householder, as it normally includes some tips on easy operation and can direct to more detailed information if required.

After extensive discussion and consideration the following headings were considered to be vital for inclusion in the quick start guide:

Overview

- This highlights the essential design principles (building form, insulation, materials, etc.) and the key features. It also has an plan image showing the location of the main heating and ventilation components (boiler, heat pump, MVHR, etc.) in the home.

Heating System

- An overview of how the building is heated; identifies the component parts with signposts to more detailed information; provides a brief explanation of the basic operation; and gives tips for saving energy.

Heating Controls

- This section outlines ways of controlling the temperature of the house; identifies controllers; suggests 'normal' settings and identifies where further information can be found.

Ventilation System

- This is an overview of the system identifying the component parts and controls, with signposts to more detailed information. It also includes a brief explanation of the basic operation, and provides tips for saving energy. This should include aspects of both natural and mechanical ventilation.

Hot water

- Provides an explanation of how hot water is provided in the home, including measures such as solar hot water panels and other related technologies. It would include an explanation of the key operation issues and tips for saving energy.

Other Energy Saving Features

- Explain any other technology which has been included as part of the SAP calculation for example, Photovoltaic panels or sunspaces.

Maintenance

- An outline of the key regular maintenance tasks such as changing filters, servicing etc.

All of these categories directly relate to the technologies required for achieving low carbon homes and are key areas where new technologies could emerge in the mass-market over the next 5 years.

A key principle of the quick start guidance is to ensure the information is simple and essential, but can direct users to more detailed operational information if required. People are more likely to use and remember something that is short and graphic. It should be directly relevant to the actual house, rather than being generic.

As well as ensuring effectiveness it also ensures that building warrant applicants do not need to spend a significant amount of time preparing a lengthy guide for each house.

There are a number of ways in which this information might be delivered including a physical booklet, on-line materials, multimedia, DVD, etc., and the literature review identified several examples of these. Whilst the baseline requirement is likely to be a physical guide, which has several advantages, the guidance could be delivered to occupants through other media.

5. Workshop Feedback

A workshop was held on the 18th January 2011 to test the ideas and present a sample of how the guidance may look.

This used the 'Glasgow House' project as an example of low carbon homes. This development is examining two types of low energy construction, built side by side and was a useful base for the workshop. We used both the meeting space for the workshop, and accessed the two demonstration houses, on which we could test the draft quick start guides. The workshop included an overview of the scope and purpose of the project and a discussion of existing occupant information. Following this the participants were given the quick start guides and access to the houses and asked to evaluate the need and effectiveness of these, together with direct labelling of key installations in the house. Afterwards there was a discussion on the issues and ways of improving the information available to new home owners.



The event had 10 participants from a range of backgrounds.

- John Gilbert Architects
- Homes for Scotland members
- Property Logbook Company

- Occupants involved in Glasgow House evaluation study
- Academic and architectural team involved in the research project.

Feedback from the event was captured in comment sheets and a summary of these are provided in Annex B. The following gives an overview of these comments:

- There was generally very positive feedback on the quick start guides.
- The draft version did not include fabric and materials; in the discussion this was considered to be important and subsequently included.
- As the houses were semi detached and we had only included one plan, one of the plans was the wrong way round and this was cited as problem for locating items of equipment.
- The discussion highlighted some tensions between inclusivity and clarity (e.g. information on fire safety) - restricted by both requirements of BSD and the need to Keep It Simple.
- The workshop identified the shortcomings in the control systems (e.g. fan boost controls), whilst this is outwith the scope of this study it clearly indicates the importance of user controls to achieving efficient running of a house.

6. Quick Start Guide Contents

The literature search, workshop and analysis led to the development of a specification requirement for the guidance. This is in two parts: General Advice which includes general information about the purpose and graphic approach of the quick start guide, and Specific Advice, which sets requirements for headings and content. The following is written in a direct style appropriate as a set of guidance instructions for a developer or their agent, consultant or architect:

Part 1 - General Advice

The guide should be written in plain English avoiding detailed technical descriptions, use bullet points where possible. The purpose of the document is not to explain how or why it works, but rather what occupants need to know to make the home work efficiently.

Do not attempt to replace the manufacturer's manuals, but do refer to them for further information. The main elements or products should be identified with their full names/model numbers and links to more information such as manuals or manufacturers websites.

Avoid jargon and acronyms. If an acronym is necessary define it on first use. In the example MVHR (Mechanical Ventilation Heat Recovery system) is used because the acronym is more likely to lead to success in Internet searches for more information.

Use Dos and Don'ts to encourage good practice in each section.

All equipment and systems should be named consistently throughout the document and on labels.

Scope

The quick start guide should be specific to each individual home. It should describe the overall performance of the home as the system, without unnecessary detail on the operation of the individual elements or systems of technology that help to create a comfortable environment. For example, it should show the boiler programmer and say in a sentence what it does and where to find the information on how to set it, rather than trying to explain how to set the programmer.

Graphic Advice

The quick start guide should use simple illustrations following the principle – 'show don't tell'. An illustration can be a hand-drawn sketch, something drawn on a computer, or a photograph. These can be mixed as consistency in style is less important than content. Illustrations do not need to be to scale (except for the plans), but should show

- Aim to fit each category on to the equivalent of a single A4 sheet.
- Avoid non-essential images (e.g. lifestyle image) that can reduce the authority and relevance of the document.
- Use graphic formats that preserve the sharpness of lines i.e. vector formats such as PDF.
- Use illustration where possible to focus the occupant on what they need to know. For example, the programmer in the Heating category should show where it is placed in relation to the boiler.
- Link key components (such as a heating controls) to a location plan to help the resident to make connections between controls and systems quickly.
- Aid understanding - many people have difficulty understanding plans, so use of other images, for example a simple 3D model alongside plans can aid comprehension.
- Use colour where possible as an easy way to differentiate categories visually. However remember readers may be colour blind, so use icons, illustrations and high contrast type to makes sure the categories are understood.
- Use high contrast type. Text should aim to be at least 11pt but can be of small sizes in annotations, labels or text boxes if in a clear typeface designed for text reading at small sizes. Make headings as large as possible to aid quick reading of the document.
- Images should be clear, using colour, photographs (well lit, avoid use of flash if possible) or line illustrations of actual installed equipment.
- Images should be labelled in a standard size and colour and using the naming convention for equipment referred to in the descriptions. For images of controls, they should show the controls only, not the whole system.
- For items of equipment it may be possible to use engineer's or manufacturer's drawings as reference in order to comprehend the system but these should be edited these to remove items that are not necessary for the resident to identify or control the system and to avoid confusion with manufacturers' brochures.

Labels

Provide labels fixed to all components of heating, ventilation and hot water, including controls. Use a consistent naming convention and colour coding. These labels should be colour coded to match the booklet colour scheme and aim to be about 11pt. Avoid small font sizes.

Part 2 - Specific Advice

Section 1 - Overview

The overview should give a brief description of the basic energy features of the house, avoiding detailed technical descriptions, but including insulation, fabric, heating, ventilation, hot water use and any major features that make a difference to how the house operates. Avoid large paragraphs, and keep the whole section to between 100 to 150 words. Use bullet points where possible.

Identify the location of key parts of the equipment, annotated on a legible plan or other illustration. Plans should be simple and clear, generally 'planning application' standard with walls blacked in, dimensions and labels removed in the CAD program. Furniture layouts are recommended as they assist users comprehension.

Use of 3D plan perspectives, axonometric diagrams, or cutaway models to aid resident understanding of the drawings are encouraged.

Items to be shown include:

- Important elements of the construction and materials - roof, walls, windows and doors
- Elements of heating, hot water and ventilation equipment
- Heat emitting devices
- Control locations
- Meters
- Water stop-cock

Use Dos and Don'ts to encourage good practice. These should be no more than 5 or each. Any limitations on alterations due to the construction, (e.g. avoid holes in external walls that penetrate the vapour barrier) can be mentioned here.

The overview page should include the following phrase:

This guide is produced to meet the aspect of 'Optimising Performance' within Section 7: Sustainability of the Building Standards Technical Handbooks.

If the dwelling has achieved Silver, Gold or Platinum levels of verification, it is permissible to use the associated Scottish Government – Sustainability badge on the overview page or the front cover.

An example spread for overview information is provided overleaf.

How your house works:

Your house



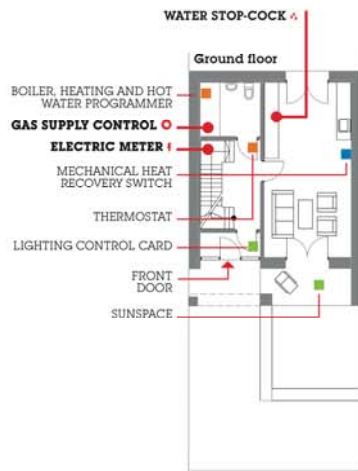
Heating p6

Ventilation p8

Hot Water p10

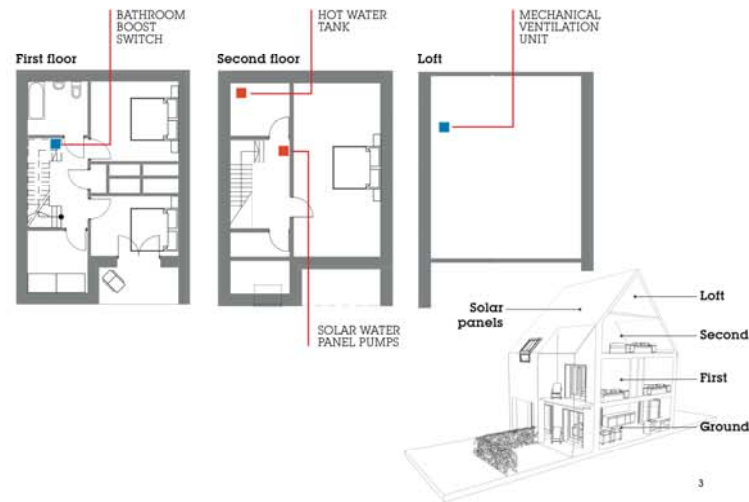
Energy Saving Features p12

Keeping it Working p14



2

OVERVIEW



3

How your house works:

Your house

Welcome to your new home. This quick start guide is designed to help you get the best out of your new house, keeping your bills and carbon footprint as small as possible.

Your house is designed to keep the heat in. It is constructed from timber frame with a timber roof structure and is very well insulated. It has double glazed windows and well insulated doors.

Your house has an efficient gas fired heating system, mechanical ventilation with heat recovery system and your hot water is heated by your gas boiler and solar panels. It also has sun spaces in front of the living room which can bring warm air into the house when it is sunny.



Sunspace
On the front of the house is a sunspace, it is outside the insulated part of the house and is designed not to be heated. When it is sunny it will warm up and you can open the doors to let heat into the house. See page 13 for more information.

Roof
The roof has a timber structure and is insulated with 350mm insulation. The OSB board on the inside of the roof is designed to prevent air leaking out. If you need to make holes in it, be sure to seal the edges well. The roof tiles are recycled rubber tyres. If tiles break, you should order new ones from City Building.

Doors
Your doors are high performance insulated doors with double glazing and 'Low E' glass. They meet the police standard 'Secured by Design'.

Walls
Your house is built from a timber frame which are fully filled with 140mm insulation, the bricks are fixed to this frame. Your home has been carefully detailed to avoid draughts, you should avoid drilling holes deep into the wall to avoid creating a new route for draughts.

Windows
Your windows are high performance double glazing with 'Low E' glass. They meet the police standard 'Secured by Design'. All of your windows open and can be cleaned from the inside. There are escape windows in all bedrooms.

OVERVIEW



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4

Section 2 - Heating

How the system works

Describe how the building can be heated, including aspects of fabric and ventilation that may be relevant (e.g. thermal mass). Cover the main principles of use in both warm and cold weather.

A simple diagram illustrating how the building is heated may be useful. Avoid heating system schematics as many people find these hard to understand.

Describe in around 50-100 words: the main heating source in the home, principles of operation and fuel source if relevant. Supplementary heating sources should be mentioned, where included.

Describe how the heat is delivered to spaces

Provide a brief description of how heat is delivered into the house, e.g. radiators, underfloor heating, air grilles, with illustrations provided as required.

Controls

Provide a brief description of around 50-100 words of how the heating in the house is controlled. Illustrations and locations are required for all the main controls. Identify the reaction to controls (for example 2 to 6 hours for underfloor heating to respond) and outline the normal range, if this is not obvious.

Images

There should be image(s) of the key heating equipment and controls used in the house. These should cover the pieces of equipment that occupants would normally come into contact with, including any items that require user maintenance.

DOs and DON'Ts

Provide a brief list of up to 5 essential DOs and DON'Ts for occupant interaction with the heating system. This should be specific to the heating system installed. Ideally these should be highlighted in a colour coded text box, in a consistent position on the page.

Further information

Provide details on where further information or guidance can be found. This may be accompanying printed material, links to manufacturers websites, or contact information.

An example spread for overview information is provided overleaf.

Example

The following is an example spread for heating information.

How your house works:

Heating

Your heating system is powered by a gas combi boiler. This provides heat for your radiators which warm the rooms. You need to adjust the TRVs and thermostat to get a comfortable temperature. If you keep your house cool it will cost less to run, a warmer house will give you a bigger fuel bill.

The construction of the house can retain heat in the winter so that it stays warmer for longer than many other houses. If the house gets too hot remember to turn the heating off before opening the windows.

The sunspace on the front of the house is designed to help keep the house warm, page 13 shows how it works.

Programmer

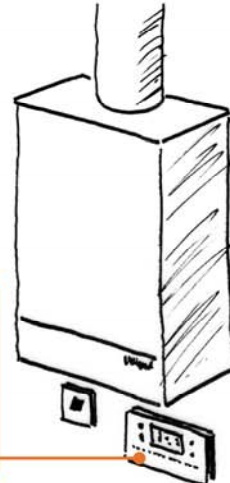
LOCATION: Underneath boiler. The programmer turns the system on and off and should be set to do this when occupants are in the house.



(Manufacturer and model number here)

Boiler

LOCATION: in the utility room. The boiler is A-rated with ultra-low emissions. It provides both heating and hot water. It is turned off by the programmer and temperature in the houses is controlled by a thermostat and radiator valves.



(Manufacturer and model number here)



(Manufacturer and model number here)

Thermostat

LOCATION: Ground floor hallway. The thermostat turns the boiler off when the house has warmed up. It overrides the TRVs. Set it to the temperature that you want your hall to be, this may be lower than the temperature of your main living rooms. 18°C is comfortable.



(Manufacturer and model number here)

Thermostatic radiator valves

LOCATION: On every radiator. These valves control the amount of heat coming out of individual radiators. When the room is at the right temperature they turn the valve off. If it gets cooler the radiator warms up again. The setting 1 is quite cool, 4 is warm, 5 is no warmer than 4, but means the radiator does not turn off even if it gets very warm.

HEATING

✓ **DO** learn how to set your programmer. There are instructions for this inside the boiler cover.

DO set your thermostat for a comfortable temperature
DO set your Thermostatic radiator valves to provide comfort, normally 3 or 4 is about right
DO remember to make sure the clock is changed when the clocks change

✗ **DON'T** set your thermostat too high, you can save energy and money by keeping this about 20°C or 21°C

DON'T set your Thermostatic radiator valves to 5
DON'T dry clothes over radiators

MORE INFORMATION:

See Manufacturers website at: (Website here)
 See Manufacturers website at: (Website here)

Section 3 - Ventilation system

How the system works

Provide up to 50 -100 words of introduction text on how the house is ventilated and the main principles for its use, in both warm and cold weather. A simple diagram illustrating how the building is ventilated is recommended.

Controls

A brief description of how the ventilation in house is controlled with illustrations and locations required for all the main controls. This should include both natural and mechanical systems.

It is important to identify the elements that users have the most interaction with. For example with natural ventilation, it may be trickle vents and opening of windows together with a reference to cross ventilation. For mechanical ventilation it may be the boost switch and location of the filters.

Images

There should be illustration(s) of the key ventilation equipment used in the house. These should cover the equipment that users should normally come into contact with, including any items that require user maintenance.

Dos and DON'Ts

Provide a brief list of up to 5 essential DOs and DON'Ts for occupant interaction with the ventilation system. This should be specific to the system installed. Ideally these should be highlighted in a colour coded text box, in consistent position on the page.

Further information

Provide details on where further information can be found. This may be accompanying printed material, links to manufacturers websites, or contact information.

An example spread for overview information is provided overleaf.

How your house works:

Ventilation

The house is ventilated by a **Mechanical Heat Recovery system (MVHR)** and windows that can be opened. The building is designed so there are no leaks or draughts, so it's important that the ventilation system is used properly. The Mechanical Heat Recovery System sucks stale air out of the kitchens and bathrooms and brings fresh air in through the vents in the ceiling, but keeps the heat from the old air. It runs all the time, there are switches in the kitchen and bathrooms to boost the system to get rid of moisture or smells.



- ✓ **DO** turn on the extract fan when cooking
- DO** use the boost switch in the bathrooms
- DO** make sure that you clean the filters regularly
- DO** open windows on in the summer to get more ventilation
- ✗ **DON'T** turn off the MHRV system, it can lead to smells, mould and poor air quality

8

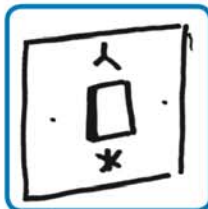
Mechanical Ventilation System
LOCATION: In loft (use a ladder to access it)
This very low power fan unit powers the ventilation system, it needs no adjustment. It has filters to ensure the air in your house is clean, you need to clean the filters (located behind flaps on the front of the unit) every month.

FILTERS

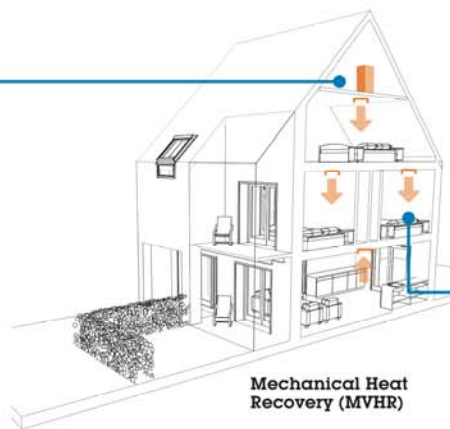


(Manufacturer and model number here)

Ventilation Boost *
LOCATION: Bathrooms and kitchen.
The boost button helps clear the steam and smells. Use it when you are using the bathroom or the kitchen and turn it off when you are finished.



Engraved switch



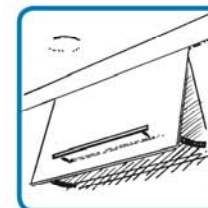
Mechanical Heat Recovery (MVHR)

MORE INFORMATION:

See Manufacturers website at: (Website here)

See Manufacturers website at: (Website here)

VENTILATION



(Manufacturer and model number here)

*** Cooker hood**

LOCATION: Above hob in kitchen.

In addition to the ventilation system, there is a cooker hood to help remove smells from the kitchen. It cleans the air and recirculates it into the room. Pull the handle out to turn the unit on.



(Manufacturer and model number here)

Vents

Most rooms have a vent that supplies or extracts air. Do not adjust these or block them up.

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Section 4 - Hot Water

How the system works

Provide up to 50-100 words on how water is heated in the homes, including secondary systems (e.g. solar hot water panels). It may be important to include a simple diagram illustrating how the system works if it has a number of components or options for use.

Controls

A brief description of how the hot water generation is controlled. Illustrate the controls, identify the reaction to controls (e.g. differences in availability of hot water for showers or baths) and outline the normal range, if this is not obvious.

Images

There should be image(s) of the key hot water generating equipment used in the house. These should cover the equipment that users should normally come into contact with, including any items that require user maintenance.

DOs and DON'Ts

Provide a brief list of up to 5 essential Dos and DON'Ts for occupant interaction with the hot water system. This should be specific to the system installed. Ideally these should be in a colour coded text box, in consistent position on the page.

Further information

Provide details on where further information can be found. This may be accompanying printed material, links to manufacturers websites, or contact information.

An example spread for overview information is provided overleaf.

How your house works:

Hot water

Hot water comes from the boiler and also the hot water solar panels on the roof. The solar panels heat the water when it is warm or sunny outside. You don't need to do anything to this system. The gas boiler heats the water when there is not enough sun. The controls for this are part of the heating system programmer.

Hot water is stored in a hot water tank. turning the taps or shower on will draw water from it. The tank contains enough for about 5 showers. If the water begins to run cold you will need to turn on the boiler and wait for the cylinder to warm up again - this will take about 90 minutes.

You have a valve on the bath which limits the water temperature to 48°C to prevent accidental scalding.



✓ **DO** set the programmer to give you hot water when there is no sun

✗ **DON'T** adjust the solar panel's settings

HOT WATER

Solar Panel
You have one on the front and one on the rear roof, you will find that during the summer the solar panels will heat up your water so you may not need your boiler on in the mornings.

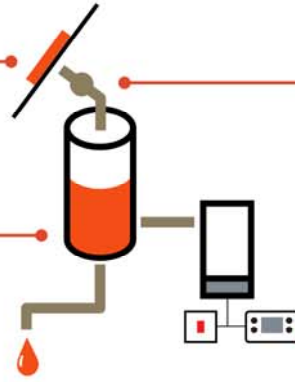


(Manufacturer and model number here)

Hot Water Store
Location: Cupboard on top floor.
There is no need to make any adjustments to these controls.



(Manufacturer and model number here)

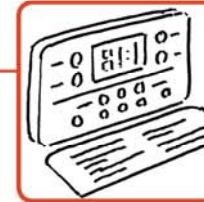


MORE INFORMATION:
See Manufacturers website at: (Website here)
See Manufacturers website at: (Website here)



(Manufacturer and model number here)

Solar Panel Pumps
LOCATION: Cupboard on top floor.
There is no need to make any adjustments to these controls.



(Manufacturer and model number here)

* **Programmer**
LOCATION: Underneath the boiler in utility room.
This programmer controls the hot water and heating system. Programme it to come on at specific times to suit your lifestyle. There is a boost button which can be used to turn on the boiler if it is needed unexpectedly.

Section 5 - Other Energy Saving Features

How each item works

Cover any other energy saving feature installed as part of the fabric of the house or included in the SAP calculation. Include specific instructions for items not covered elsewhere. Each item should have a brief (around 50 words) description of other energy saving features.

Identify for each item:

- Name or description
- Location
- How to control it and where the controls are located
- Manufacturer and model number
- Location of further information such as a manual or specific website address

Images

There should be image(s) of the features being described. These should be of equipment that users should normally come into contact with, including any items that require user maintenance.

DOs and DON'Ts

Provide a brief list of up to 5 essential DOs and DON'Ts for occupant interaction with these energy saving features.

Further information

Provide details on where further information can be found. This may be accompanying printed material, links to manufacturers websites, or contact information.

An example spread for overview information is provided overleaf.

How your house works:

Energy saving features

Your house has the following energy saving features:

- sunspaces
- low energy lighting
- lighting control card

Using them effectively will reduce your energy bills.

Your house is designed to use low energy light bulbs, they last longer than normal light bulbs and use much less energy. Remember to replace blown bulbs with low energy types.



Summer



Spring & Autumn



Winter

ENERGY SAVING FEATURES



(Manufacturer and model number here)

* Lighting Control

LOCATION: By the front door. It is designed to turn off all the lights when you leave the house. Remember to check there is a card in the slot if your lights don't work. This card reader takes any type of plastic card.

Sunspaces

When it is sunny this space will heat up and you can open the doors into your bedroom and living room and let the heat into the house. In the summer, if this space gets too hot, open the vents in the glazed roof to let the heat out, remember to close them when the temperature drops. When it is cloudy, this space will be cold, keep the doors shut to keep the house warm. This space is not designed to be heated.

- ✓ **DO** use your sunspace to heat the house when it is sunny
- ✓ **DO** close the sunspace doors when the weather is cloudy and cold
- ✗ **DON'T** put a heater in the sunspace

Section 6 - How to Maintain These Systems

How to keep your home running efficiently

This section should provide an easy to understand list of the maintenance required for systems outlined in the guide. It must only include items that residents should be undertaking without tools or specialist knowledge. In particular consider including the following information:

- List of equipment names/serial numbers
- Links to further detailed information
- Manufacturers Websites
- Recommended Servicing Organisations
- Other contact details, e.g. helplines, emergency numbers where applicable

An example spread for overview information is provided overleaf.

How your house works:

Keeping it working

Your house requires regular maintenance to ensure it continues to work well for many years. Poorly maintained systems tend to be more inefficient and cost more to run.

Every Month

Wash filters in the ventilation system
Clean sunspace windows

Every Year

Boiler check by Registered Gas Safe Engineer
Replace the filters in the ventilation system (sold by Vent Axia, type F7)



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KEEPING IT WORKING

Resources

Your welcome pack contains the manuals for the following equipment.

Heating

Programmer

Type: Pottererton 24hr Digital 2 Channel Programmer
www.pottererton.co.uk

Boiler

Type: Pottererton Promax HE Plus Combi Boiler
www.pottererton.co.uk

Ventilation

Mechanical Ventilation System

Type: Vent Axia Sentinel Kinetic Plus
www.vent-axia.com

Hot Water

Programmer

Type: Pottererton 24hr Digital 2 Channel Programmer
www.pottererton.co.uk

Boiler

Type: Pottererton Promax HE Plus Combi Boiler
www.pottererton.co.uk

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7. Conclusions

The research and subsequent testing indicates that a useful guidance document, accessible and useable by occupants, but which contains information that is reasonably available to building warrant applicants can be provided. The information to be contained in the quick start guide should be prepared by the building warrant applicant (or their agent) in 2-stages:

1. The quick start guide will be submitted at the detailed building warrant application stage. This should include as much information as possible including the plan, an outline of the construction and building fabric, systems or equipment specified already and any other environmental features.
2. Before submitting at completion certificate stage, the quick start guide should be reviewed and updated as necessary.

The document is compact and graphic and allows the householder to scan it quickly and comprehend as much as possible. If it can quickly convey that it contains useful information it is more likely to be kept safe and used for future reference.

Based on the review of existing documents, a variety of formats can be used to convey complex information. The quick start guide should be available at anytime to residents and should be capable of being passed on to future owners or residents. It can be a freestanding document, separate from other documentation (but including directions to further information), but it may be designed to meet a similar graphic standard of other material, which is provided at handover. It is understood that BSD have a preference for a 4-page A4 guide. Our research indicates the following are similarly acceptable forms of communicating the information:

- Booklet in a variety of sizes - easy to produce, portable. Sizes smaller than A4 can provide double page spreads and can be carried around the house. Should be identifiable through its format and colour, i.e. not A4 photocopies.
- Poster affixed to the property - cannot be taken around the house, but may be placed in several locations, e.g. boiler cupboards.
- Local digital information (DVD, USB stick, etc) - can include multimedia to aid explanation, can only be accessed in one location.
- On-line information - can include multimedia, easy links to further information, potentially permanent information. Can only be accessed online and in one location (use of portable digital technology may widen this).

The specification of information does not preclude the use of any of these formats.

The guide will provide a gateway to more detailed information. As this will often be manufacturers' information and manuals, it is not possible to specify the format of these.

In researching the subject and through the workshop, there was a clear demand for information that was specific to each house. This includes plans of the house locating key items of equipment and information only on the systems in place in that house. Where there are a number of houses of the same type, it is likely that the information could be repeated for each type, however care should be taken to ensure correct orientation of plans and correct location of installations.

It is recognised that this is a voluntary standard and it is expected that housebuilders and housing associations will print small volumes of slightly different information rather than a single document for a whole development (which is the current industry standard). It is expected that housebuilders would prepare similar documents for each house type in their portfolio.

Subsequent feedback from some groups and organisations contacted during this study indicates a high degree of acceptability of these principles, and we have identified a strong demand for such a document, including approaches to produce similar documents to that used in the test case.

There is further scope for development of this work. Key issues will be the relationship to the guidance and the quality and usability of control and feedback systems in dwellings, and/or systems which rely on more passive measures.

Further scope is also likely in relation to the delivery of augmented guidance through digital media, for example smart phones or tablet computers that can easily link to further data, smart metering data and control systems.

8. Findings

Based on the research, literature review and workshop the findings of this project are as follows:

- Within a voluntary upper level of optimising performance in Section 7 Sustainability of the Technical Handbooks, include user information
- Adopt a quick start guide format together with minimum information standards and graphic standards
- Require the document at building warrant stage and a final document at the completion stage
- No specific format is specified, rather a range of options are identified
- Require the quick start guide to be specific to each house
- Require the quick start guide to signpost other important documentation such as appliance manuals
- Require illustrated sections on:
 - Overview
 - Heating
 - Ventilation
 - Hot Water
 - Other Energy Saving Features
 - Maintenance of Systems
- A 'best practice' quick start guide is included in Annex A
- As a further option, applicants to demonstrate they have also:
 - Labelled key appliances and related these labels to the contents of the quick start guide
 - Given copies of manuals for the appliances to the occupants

1. Annex A - Example Material

Attached is an example of the material required for this standard based on the 'Glasgow House' built by City Building and Glasgow Housing Association in Glasgow. These houses were designed by PRP architects to meet future building regulations and minimise tenants fuel poverty issues.

It is important to note that we have used information provided by City Building for this house in order to simulate an example of graphics and levels of information required for compliance with the sustainability standard.

How Your Low Carbon Home Works

 Overview

 Heating

 Ventilation

 Hot Water

 Energy Saving Features

 Keeping it Working



How your home works:

Your house



 Heating p6

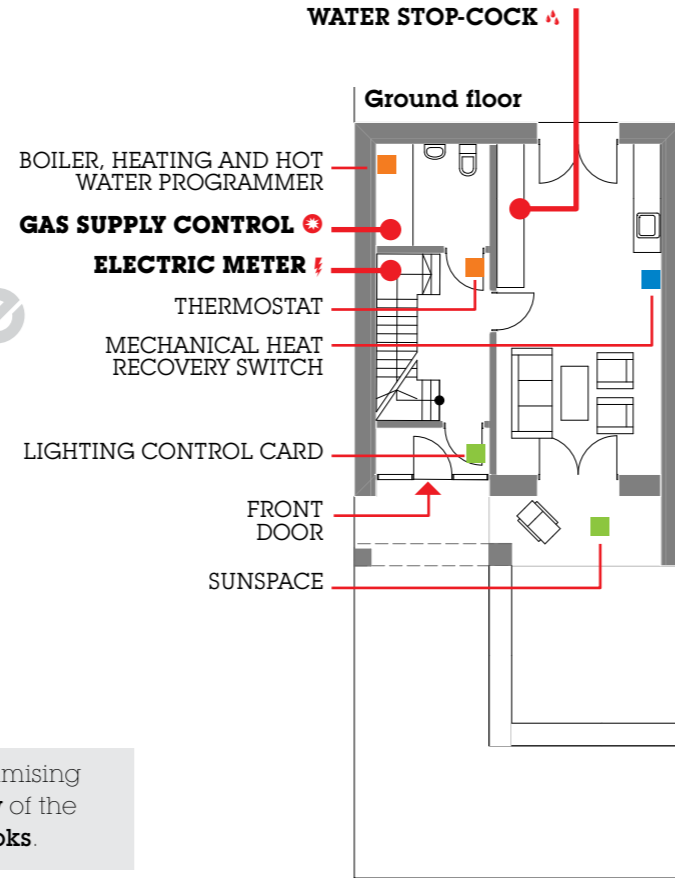
 Ventilation p8

 Hot Water p10

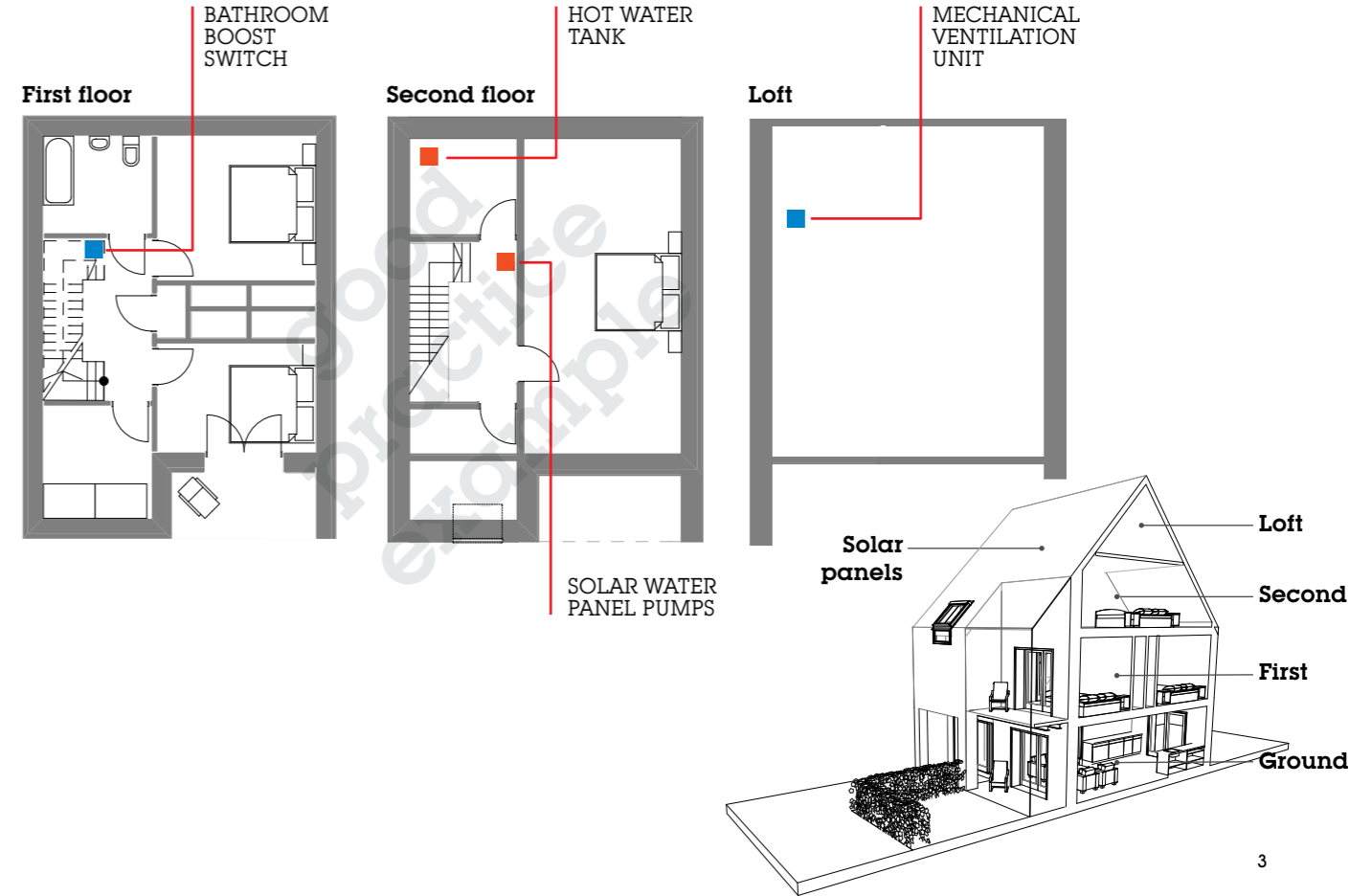
 Energy Saving Features p12

 Keeping it Working p14

This guide is produced to meet the aspect of optimising the performance within **Section 7: Sustainability** of the Scottish Building Standards Technical Handbooks.



OVERVIEW



How your home works:

Your house

Welcome to your new home. This quick start guide is designed to help you get the best out of your new house, keeping your bills and carbon footprint as small as possible.

Your house is designed to keep the heat in, it is constructed from timber frame with a timber roof structure and is very well insulated. It has double glazed windows and well insulated doors.

Your house has an efficient gas fired heating system, mechanical ventilation with heat recovery system and your hot water is heated by your gas boiler and solar panels. It also has sun spaces in front of the living room which can bring warm air into the house when it is sunny.

Sunspace

On the front of the house is a sunspace, it is outside the insulated part of the house and is designed not to be heated. When it is sunny it will warm up and you can open the doors to let heat into the house. See page 13 for more information.

Roof

The roof has a timber structure and is insulated with 350mm insulation. The OSB board on the inside of the roof is designed to prevent air leaking out, if you need to make holes in it, be sure to seal the edges well. The roof tiles are recycled rubber tyres. If tiles break, you should order new ones.

Doors

Your doors are high performance insulated doors with double glazing and 'Low E' glass. They meet the police standard 'Secured by Design'.

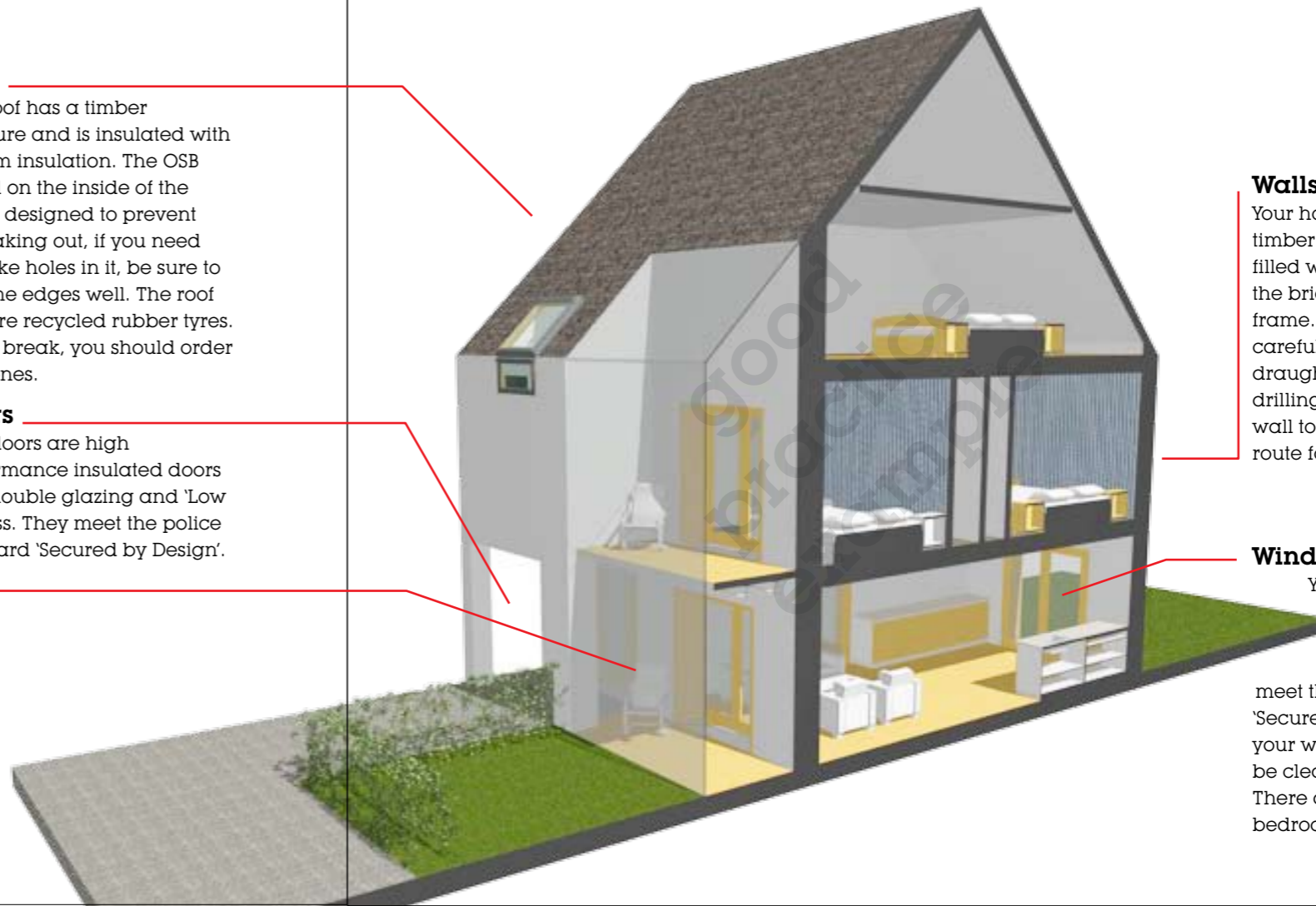
OVERVIEW

Walls

Your house is built from a timber frame which is fully filled with 140mm insulation, the bricks are fixed to this frame. Your home has been carefully detailed to avoid draughts, you should avoid drilling holes deep into the wall to avoid creating a new route for draughts.

Windows

Your windows are high performance double glazing with 'Low E' glass. They meet the police standard 'Secured by Design'. All of your windows open and can be cleaned from the inside. There are escape windows in bedrooms on the first floor.



Heating

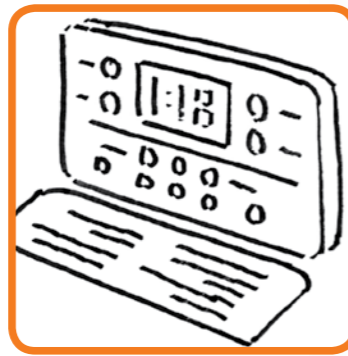
Your heating system is powered by a gas combi boiler. This provides heat for your radiators which warm the rooms. You need to adjust the thermostatic radiator valves (TRV's) and thermostat to get a comfortable temperature. If you keep your house cool it will cost less to run, a warmer house will give you a bigger fuel bill.

The construction of the house can retain heat in the winter so that it stays warmer for longer than many other houses. If the house gets too hot remember to turn the heating off before opening the windows.

The sunspace on the front of the house is designed to help keep the house warm, page 13 shows how it works.

* Programmer

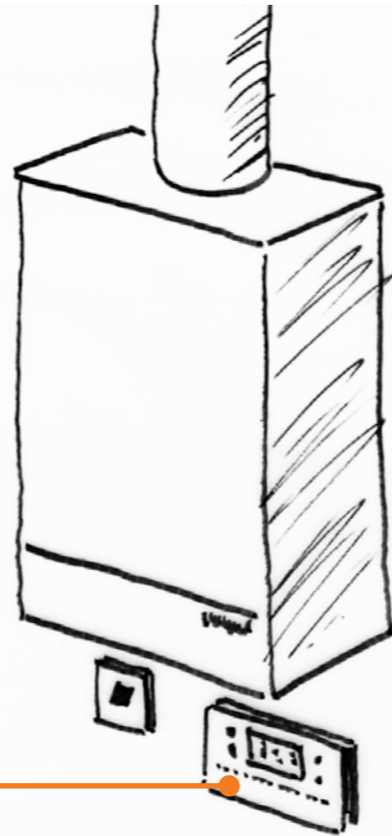
LOCATION: Underneath boiler. The programmer turns the system on and off and should be set to do this when occupants are in the house.



(Manufacturer and model number here)

Boiler

LOCATION: in the utility room. The boiler is A-rated with ultra-low emissions. It provides both heating and hot water. It is turned off by the programmer and temperature in the houses is controlled by a thermostat and radiator valves.



(Manufacturer and model number here)

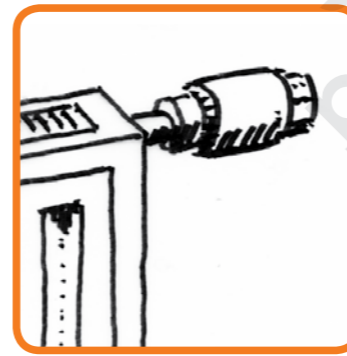


(Manufacturer and model number here)

* Thermostat

LOCATION: Ground floor hallway.

The thermostat turns the boiler off when the house has warmed up, it overrides the TRV's. Set it to the temperature that you want your hall to be, this may be lower than the temperature of your main living rooms. 18°C is comfortable.



(Manufacturer and model number here)

* Thermostatic radiator valves (TRV's)

LOCATION: On every radiator. These valves control the amount of heat coming out of individual radiators. When the room is at the right temperature they turn the valve off. If it gets cooler the radiator warms up again. The setting 1 is quite cool, 4 is warm. 5 is no warmer than 4, but means the radiator does not turn off even if it gets very warm.

- ✓ **DO** learn how to set your programmer. There are instructions for this inside the boiler cover.
- DO** set your thermostat for a comfortable temperature
- DO** set your Thermostatic radiator valves to provide comfort, normally 3 or 4 is about right
- DO** remember to make sure the clock is changed when the clocks change
- ✗ **DON'T** set your thermostat too high, you can save energy and money by keeping this about 20°C or 21°C
- DON'T** set your Thermostatic radiator valves to 5
- DON'T** dry clothes over radiators

MORE INFORMATION:

See Manufacturers website at: (Website here)

See Manufacturers website at: (Website here)

How your home works:

Ventilation

The house is ventilated by a **Mechanical Heat Recovery system (MVHR)** and windows that can be opened. The building is designed so there are no leaks or draughts, so it's important that the ventilation system is used properly. The Mechanical Heat Recovery System sucks stale air out of the kitchens and bathrooms and brings fresh air in through the vents in the ceiling, but keeps the heat from the old air. It runs all the time, there are switches in the kitchen and bathrooms to boost the system to get rid of moisture or smells.

- ✓ **DO** turn on the extract fan when cooking
- DO** use the boost switch in the bathrooms
- DO** make sure that you clean the filters regularly
- DO** open windows in the summer to get more ventilation
- ✗ **DON'T** turn off the MHRV system, it can lead to smells, mould and poor air quality

Mechanical Ventilation System

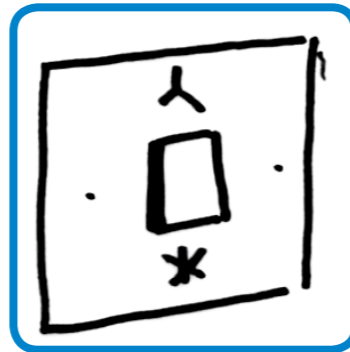
LOCATION: In loft (use a ladder to access it)
This very low power fan unit powers the ventilation system, it needs no adjustment. It has filters to ensure the air in your house is clean, you need to clean the filters (located behind flaps on the front of the unit) every month.



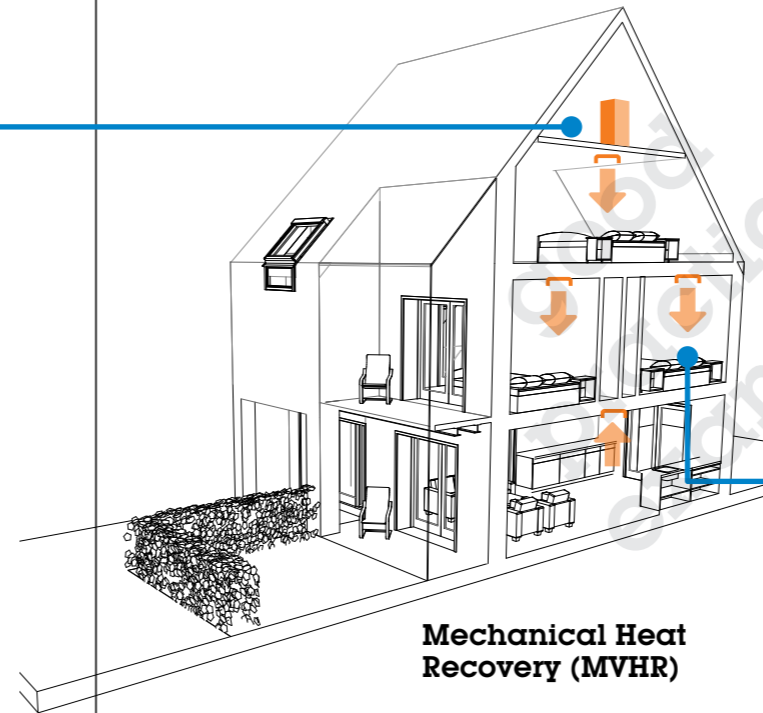
(Manufacturer and model number here)

Ventilation Boost *

LOCATION: Bathrooms and kitchen.
The boost button helps clear the steam and smells. Use it when you are using the bathroom or the kitchen and turn it off when you are finished.



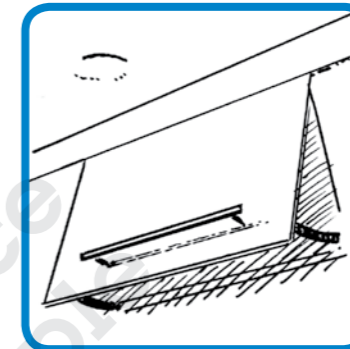
Engraved switch



Mechanical Heat Recovery (MVHR)

MORE INFORMATION:

See Manufacturers website at: (Website here)
See Manufacturers website at: (Website here)



(Manufacturer and model number here)

* Cooker hood

LOCATION: Above hob in kitchen.
In addition to the ventilation system, there is a cooker hood to help remove smells from the kitchen. It cleans the air and recirculates it into the room. Pull the handle out to turn the unit on.



(Manufacturer and model number here)

Vents

Most rooms have a vent that supplies or extracts air. Do not adjust these or block them up.

How your home works:

Hot water

Hot water comes from the boiler and also the hot water solar panels on the roof. The solar panels heat the water when it is warm or sunny outside. You don't need to do anything to this system. The gas boiler heats the water when there is not enough sun, the controls for this are part of the heating system programmer.

Hot water is stored in a hot water tank, turning the taps or shower on will draw water from it. The tank contains enough for about 5 showers. If the water begins to run cold you will need to turn on the boiler and wait for the cylinder to warm up again - this will take about 90 minutes.

You have a valve on the bath which limits the water temperature to 48°C to prevent accidental scalding.

✔ **DO** set the programmer to give you hot water when there is not enough sun

✘ **DON'T** adjust the solar panel's

Solar Panel

You have one on the front and one on the rear roof, you will find that during the summer the solar panels will heat up your water so you may not need your boiler on in the mornings.



(Manufacturer and model number here)

Hot Water Store

Location: Cupboard on top floor.
There is no need to make any adjustments to these controls.



(Manufacturer and model number here)

HOT WATER

Solar Panel Pumps

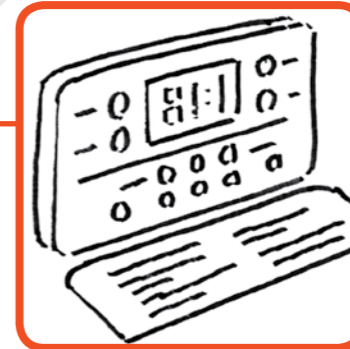
LOCATION: Cupboard on top floor.
There is no need to make any adjustments to these controls.



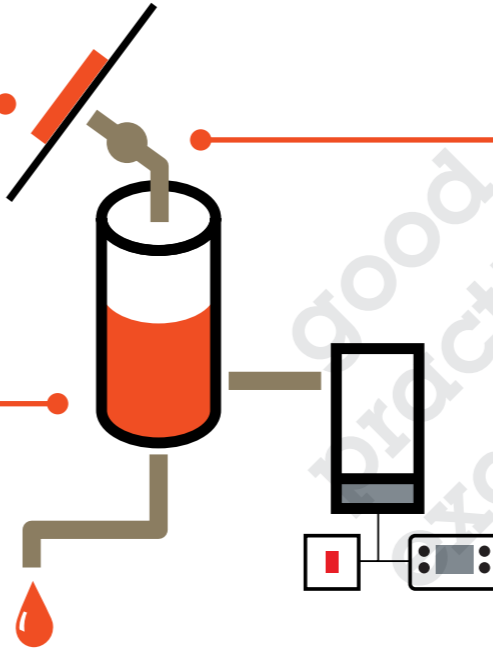
(Manufacturer and model number here)

* Programmer

LOCATION: Underneath the boiler in utility room.
This programmer controls the hot water and heating system. Programme it to come on at specific times to suit your lifestyle. There is a boost button which can be used to turn on the boiler if it is needed unexpectedly.



(Manufacturer and model number here)



MORE INFORMATION:

See Manufacturers website at: (Website here)

See Manufacturers website at: (Website here)

How your home works:

Energy saving features

Your house has the following energy saving features:

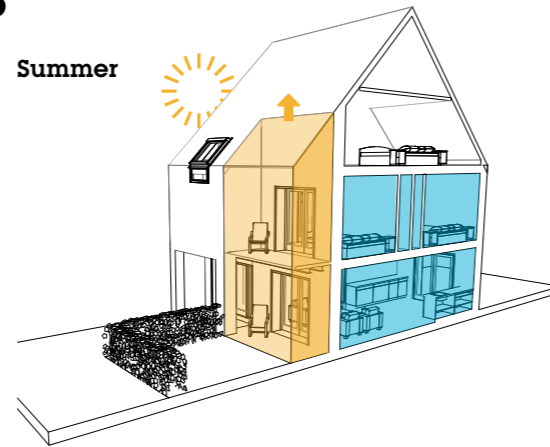
- sunspaces
- low energy lighting
- lighting control card

Using them effectively will reduce your energy bills.



Your house is designed to use low energy light bulbs, they last longer than normal light bulbs and use much less energy.

Remember to replace blown bulbs with low energy types.



Summer



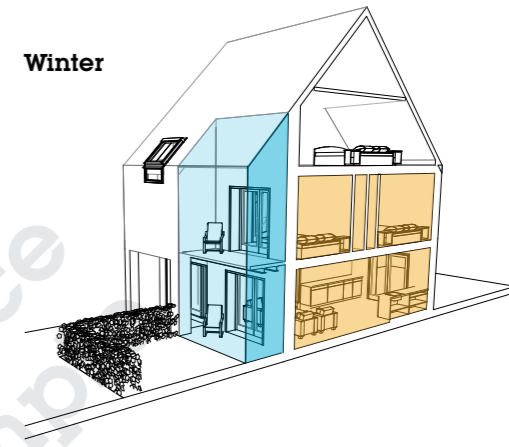
(Manufacturer and model number here)

* Lighting Control

LOCATION: By the front door. It is designed to turn off all the lights when you leave the house. Remember to check there is a card in the slot if your lights don't work. This card reader takes any type of plastic card.



Spring & Autumn



Winter

ENERGY SAVING FEATURES

Sunspaces

When it is sunny this space will heat up and you can open the doors into your bedroom and living room and let the heat into the house. In the summer, if this space gets too hot, open the vents in the glazed roof to let the heat out, remember to close them when the temperature drops. When it is cloudy, this space will be cold, keep the doors shut to keep the house warm. This space is not designed to be heated.

- ✓ DO use your sunspace to heat the house when it is sunny
- ✓ DO close the sunspace doors when the weather is cloudy and cold
- ✗ DON'T put a heater in the sunspace

How your home works:

Keeping it working

Your house requires regular maintenance to ensure it continues to work well for many years. Poorly maintained systems tend to be more inefficient and cost more to run.

Every Month

Wash filters in the ventilation system
Clean sunspace windows

Every Year

Boiler check by Registered Gas Safe Engineer
Replace the filters in the ventilation system (insert type and manufacturer)



Resources

Your welcome pack contains the manuals for the following equipment.

Heating

Programmer

See Manufacturers website at: (Website here)

Boiler

See Manufacturers website at: (Website here)

Ventilation

See Manufacturers website at: (Website here)

Hot Water

Programmer

See Manufacturers website at: (Website here)

Boiler

See Manufacturers website at: (Website here)

good
practice
example

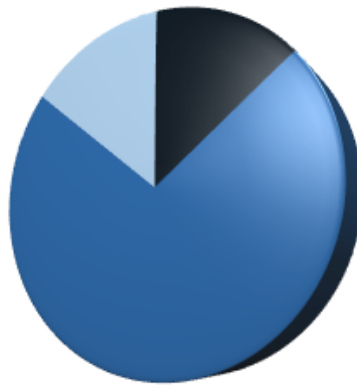
Prepared for Scottish Building Standards
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2. Annex B - Workshop Results

Question 1

Based on the information given, how confident are you that you can operate the house?

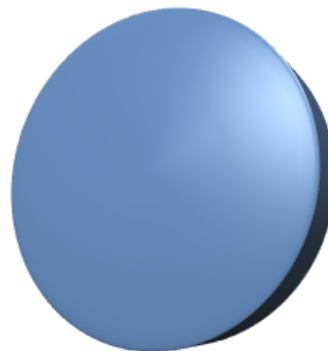
- Still don't understand
- Confident
- Understand the principles
- Know it inside out



Question 2

Has the user manual helped you understand how this house works?

- Yes
- No

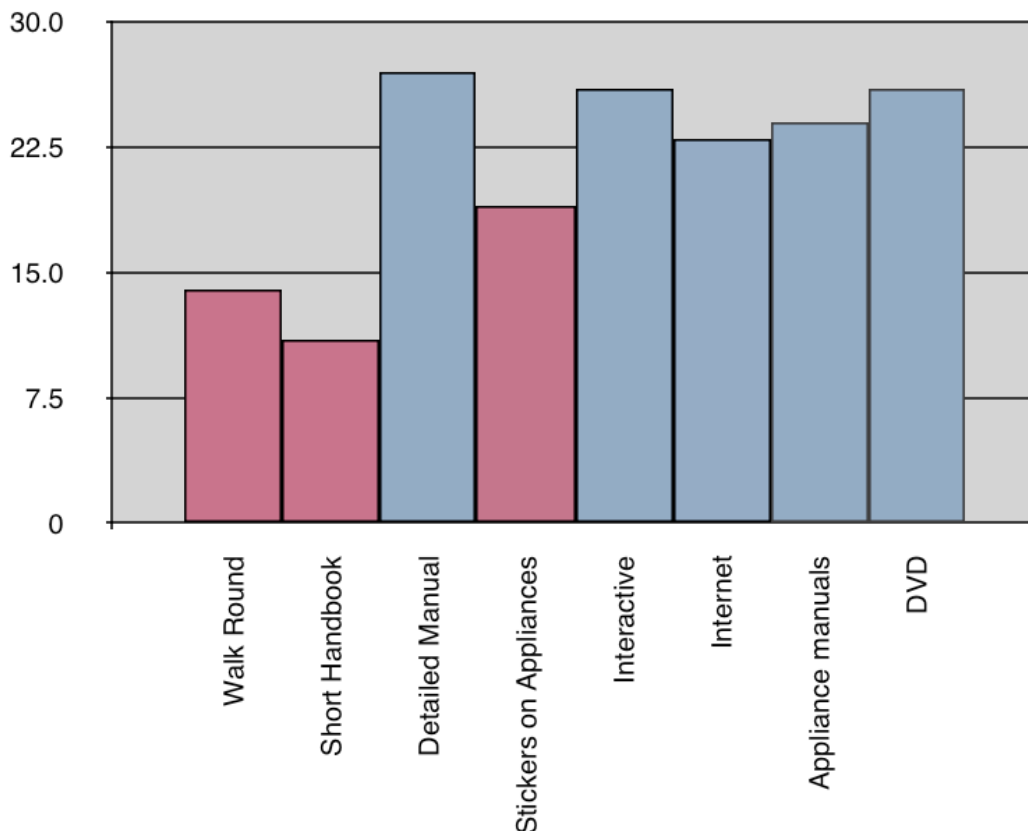


Question 3

Based on the information given at the event, please rank the following methods from 1 (best method) to 5 (worst method).

People were shown a range of types of information and then asked to rank the following options, with a low score being best. The following graph gives the results with the three best performing methods highlighted in red.

Analysis



Whilst the number of people attending this event was lower than hoped, by getting everyone to actually use the mock up guide there was a great deal of constructive feedback on the proposals which would not have been achieved with a larger group. Specific comments were:

- The quick start guide must give information specifically to that house;
- It must be short and to the point, only telling people what they need to know to get the house working properly;
- The quick start guide is not a replacement for manuals or more detailed residents handbooks;
- Absence of usual noises (MVHR) or buttons that residents need not adjust are as important as telling them what they should adjust; and
- Items other than energy appliances were discussed in some detail, whilst it is outwith the remit of this report, the feedback shows a need for basic information on the following:
 - Fire and fire escapes
 - Service location such as stop cocks and isolator switches.