



Lifespan SBEM User Manual v6.1.b

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Introduction

The National Calculation Model (NCM) is the agreed calculation methodology and procedure used to implement Building Regulations Compliance along with Energy Performance Certificates in Non-Domestic Buildings. The Simplified Building Energy Model (SBEM) is the calculation software, funded by the DCLG and developed by the BRE, used to implement the NCM. This calculation software does not have an integrated user interface and these have been developed by commercial entities, along with a basic free version provided by the BRE in the form of iSBEM.

Lifespan SBEM is graphical user interface (GUI) to the SBEM calculation engine which seeks to improve on the basic user interface funded by DCLG. It provides an intuitive and step by step approach to the energy assessment process which aims to make the whole process more accessible, straight forward and less error prone whilst being easily affordable.

As Lifespan SBEM is a graphical interface and undertakes very little in the way of calculation itself, this manual should be read in conjunction with the SBEM Technical Manual along with the NCM modelling guide and the iSBEM manual where relevant in order to fully understand the procedures and impact of each field. For the purpose of EPC generation, the user should be full conversant with the relevant Non-Domestic EPC conventions in force at the time of lodgement. Further details will be available from your accreditation scheme.

This manual will only cover the Lifespan SBEM software interface and not the SBEM calculation and methodologies.

Getting started with Lifespan SBEM

Pre-requisites

Lifespan SBEM is primarily aimed at the Energy Performance Certificate assessor. It is therefore recommended that you have undertaken a training course to become an Energy Assessor prior to using Lifespan SBEM in order to fully understand the calculation methodology and its requirements. There are many training courses available from commercial entities, many of whom will use Lifespan SBEM within their training. We would suggest that if you have used a basic SBEM interface within your training you will be more than ready to use Lifespan SBEM. If you have not undertaken a training course you will still be able to use Lifespan SBEM, however you may experience some difficulties.

Installation

Lifespan SBEM is entirely web based therefore there are no installation or project files to install or maintain. All files are kept within your account and can be downloaded any time you require. The software is compatible with any computer that is able to run a modern internet browser connected to the internet. The software will perform well on even the most basic PC, however if you currently

experience internet performance issues these are likely to be reflected in the performance of the software.

Registration

In order to use the software, you will need to register your details with us. In order to register, please visit www.lifespansbem.com/members/register.aspx or visit the relevant area of the parent website at www.lifespan-software.com.

The registration process will only take a minute and will give you the opportunity to provide your energy assessor details, where available. These will be verified by us at a later point; however it may be best to contact your scheme as we understand that some will issue you with a revised number for use with different software.

Once you have completed registration, please visit www.lifespansbem.com/members/login.aspx and use the username and password detailed during registration to log into the software. Once you have logged into the software you will be asked to add details of your Professional Indemnity Insurance cover. This is primarily for use when lodging Energy Performance Certificates therefore please ensure it is correct and matches the details held by your scheme if applicable. If you proceed to attempt lodgement in the future without correct details specified it is likely to cause issues and may lead to legal/ scheme conduct issues. If you are intending to use the software for training please specify dummy details, though please ensure these are revised if you expect to lodge in the future.

At this stage you will be able to access the SBEM interface using the 'View energy surveys' link on your Control Panel, however some functionality will be restricted.

Before you will be able to successfully lodge Energy Performance Certificates and be granted full functionality you will need to forward some details of your qualifications to our team. Full details of the requirements can be found at the 'Upgrade your training account to start lodging' link in the top of the 'Overview' area of your Control Panel.

The Control Panel

The control panel is the area of the software where you are able to manage the administrative aspects of your account. It has 3 main sections, 'Overview', 'My Account' and 'General Support/ Downloads'.

Overview

This contains links to access the interface software and related functionality.

'View energy surveys' opens up the interface software of the relevant version

'Import a survey' provides functionality to copy a survey from a linked company account.

'Cancel an existing certificate' provides functionality to cancel a certificate you have already lodged to the central government register. This is only available in certain circumstances.

'Export property list' exports a list of properties you have lodged through Lifespan SBEM.

'Historic surveys' opens up details of software and surveys lodged in previous versions of Lifespan SBEM.

My Account

'Edit profile' allows you to edit your name, company details and email address. Please ensure these are kept up to date as they will be attributed to the surveys you produce and used by us to contact you.

'Account statement' details the financial transactions undertaken at lodgement etc. 'Add funds' allows you to credit your account prior to any transactions.

'Current fees' details the current fees applicable to your account.

'Manage professional indemnity insurance' allows you to review and update the insurance details attributed to your account and surveys.

'Set up new company account' allows you to set up a company account to fund multiple assessor accounts.

'Link to company account' allows you to link your account to an already existing company account.

'Please register your data gatherers' allows you to register any data gatherers you use. These will be required to be recorded against any lodgements you have made where data gatherers have been used.

'Set up automatic lodgement' allows you to link your Lifespan SBEM account to your accreditation scheme where applicable.

General Support/Downloads

This area provides general support details and any other information that may change over time.

The Lifespan SBEM Interface

Clicking on the 'View energy surveys' button of the 'Overview' area in your Control Panel will open the Lifespan SBEM interface.

The Survey Summary Screen

The initial screen displays a summary of any surveys you have already undertaken along with providing access to relevant reports associated with them. It is also the area that grants access to other tools

including integrated lodgement and summary tools specific to Lifespan along with providing access to your projects and new projects.

Summary of your existing projects. To select an existing project, click on the Building Name. For each project the Building Name, Building Address, Purpose of Analysis, Inspection Date, Building Regs status, EPC Rating and Lodged status is displayed.

SBEM Reports. This box contains a list of reports available for the selected property. Where a report is not available it is likely that the survey has not been calculated since its last edit or the report is not relevant to this particular project e.g. BRUKL report on an EPC project.

The screenshot displays the 'Project Finder' section with a search interface and a table of 'Matching Projects Found'. The table includes columns for Building Name, Building Address, Purpose of Analysis, Inspection Date, BRegs Pass, EPC Rating, and Lodged status. A sidebar on the right shows a list of 'SBEM Reports' available for the selected property.

Building Name	Building Address	Purpose of Analysis	Inspection Date	BRegs Pass	EPC Rating	Lodged
ENGLAND - Test Case 01	Street 01, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B28	False
ENGLAND - Test Case 02	Street 02, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A19	False
ENGLAND - Test Case 03	Street 03, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A18	False
ENGLAND - Test Case 04	Street 04, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A14	False
ENGLAND - Test Case 05	Street 05, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A14	False
ENGLAND - Test Case 06	Street 06, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B31	False
ENGLAND - Test Case 07	Street 07, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B30	False
ENGLAND - Test Case 08	Street 08, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A15	False
ENGLAND - Test Case 09	Street 09, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A9	False
ENGLAND - Test Case 10	Street 10, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A19	False
ENGLAND - Test Case 11	Street 11, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A25	False
ENGLAND - Test Case 12	Street 12, St Albans, AL1 3ER	EPC England	1/6/2022	NO	B42	False
ENGLAND - Test Case 13	Street 13, St Albans, AL1 3ER	EPC England	1/6/2022	YES	A11	False
ENGLAND - Test Case 14	Street 14, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A22	False
ENGLAND - Test Case 15	Street 15, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B33	False
ENGLAND - Test Case 16	Street 16, St Albans, AL1 3ER	EPC England	28/11/2017	NO	C52	False
ENGLAND - Test Case 17	Street 17, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B37	False
ENGLAND - Test Case 18	Street 18, St Albans, AL1 3ER	EPC England	28/11/2017	NO	A22	False
ENGLAND - Test Case 19	Street 19, St Albans, AL1 3ER	EPC England	28/11/2017	NO	B27	False
ENGLAND - Test Case 20	Street 20, St Albans, AL1 3ER	EPC England	28/11/2017	NO	C51	False

The sidebar on the right lists the following SBEM Reports:

- Compliance with England Building Regulations Part L
- Additional Details Report
- SBEM Main Output Document
- Data Reflection - Actual Building
- Data Reflection - Notional Building
- Risk of Overheating
- Technical Output - Actual Building
- Technical Output - Notional Building
- SBEM Input Data File
- EPCgen Input Data File
- BRUKL Input Data File
- BBL11 Input Data File
- SBEM Error Log
- SBEM Calculation Log
- Lifespan SBEM Error Log

The buttons at the bottom of the page are used to create a 'New' project, or 'Edit', 'View' or 'Delete' an existing project. Where you are seeking to manipulate an existing project, it must first be selected by clicking on the Building Name. The 'View' differs from 'Edit' in that 'View' cannot be used to make alterations (i.e., a safeguard)



Lifespan SBEM Interface – General Overview

The pane on the left-hand side summarises the sections within Lifespan SBEM that must be completed for each project. You may navigate by clicking on each section directly in the pane or by using the 'Next'/'Previous' buttons at the bottom of the page. Ideally you should work from beginning to end however you are able to skip back and forth, though some features reference the library you create initially therefore this should be considered. The section you are currently in will be highlighted a different colour.

The software manual is available to download at all times.

The 'Calculate Energy Ratings' button can be pressed at any time once the project is complete. This will overwrite any reports previously created and also reset the Recommendations Report to its default state (i.e. no user input).

The 'Next'/'Previous' buttons should be used as the preferred method of navigating the software. These will validate data on the screen for errors/ omissions.

Pressing the 'Save' button at any point will drop any reports previously created. This is to prevent any reports from reflecting the data inaccurately.

Any additional, or modified data inputs introduced in Lifespan SBEM v6.1.b will be highlighted lime green for additional data inputs or light blue for modified data inputs.

The screenshot displays the Lifespan SBEM software interface. At the top, there is a navigation bar with buttons for 'Calculate Energy Ratings', '< Previous', 'Next >', and 'Save'. A 'Software Manual' button is also visible. The main area contains a form for project details, including fields for 'Purpose of Analysis', 'Address', 'Street', 'Postcode', and 'UPRN'. A sidebar on the left lists project settings: 'Project Settings', 'Building Details', 'Project Details', 'Occupier Details', and 'Building Services'. The 'Additional Data Inputs' section is highlighted in lime green, and the 'Modified Data Inputs' section is highlighted in light blue. The title bar of the window reads 'ENGLAND - Test Case 01'.

Project Settings

Building Details

Purpose of analysis – Select the relevant purpose of analysis from the drop down. This should relate to the purpose of the assessment you are undertaking and will dictate some of the reports generated. The selections available will be restricted according to the calculation engine version.

Building Name - Provide a building name for your reference.

The screenshot shows the 'Building Details' section of the Lifespan SBEM software. The interface includes a sidebar with navigation options, a main form area, and a top navigation bar. The form contains the following fields and callouts:

- Purpose of Analysis:** A dropdown menu set to 'EPC England'. Callout: 'Purpose of analysis – Select the relevant purpose of analysis from the drop down. This should relate to the purpose of the assessment you are undertaking and will dictate some of the reports generated. The selections available will be restricted according to the calculation engine version.'
- Building Name:** A text input field containing 'ENGLAND - Test Case 01'. Callout: 'Building Name - Provide a building name for your reference.'
- Building Type:** A dropdown menu set to 'B1 Offices and Workshop businesses'. Callout: 'Building Type - Select the Building Type applicable to the project.'
- Address:** A text input field containing 'Street 01'. Callout: 'Address – For BRUKL reports (or similar) type the address in the relevant fields. For EPC assessments, clicking in any address field or the UPRN field will open a pop-up box for the relevant address register. Details can be found in the address search area of the manual.'
- City:** A text input field containing 'St Albans'.
- Postcode:** A text input field containing 'AL1 3ER'.
- UPRN (prefixed with UPRN- followed by 12 digits):** A text input field containing 'UPRN-000000000000'.
- Inspection Date:** A date input field containing '28/11/2017'. Callout: 'Inspection date – This should relate to the date you physically inspected site. In the case of EPCs this field combined with the UPRN will create the Report Reference Number (RRN) therefore no two submissions may have the same combinations.'

Inspection date – This should relate to the date you physically inspected site. In the case of EPCs this field combined with the UPRN will create the Report Reference Number (RRN) therefore no two submissions may have the same combinations.

Address – For BRUKL reports (or similar) type the address in the relevant fields. For EPC assessments, clicking in any address field or the UPRN field will open a pop-up box for the relevant address register. Details can be found in the address search area of the manual.

Project Details

Weather Location – This refers to the nearest physical location to the assessed property.

Additionally check building regulations – Generates BRUKL reports where EPC analysis type is selected.

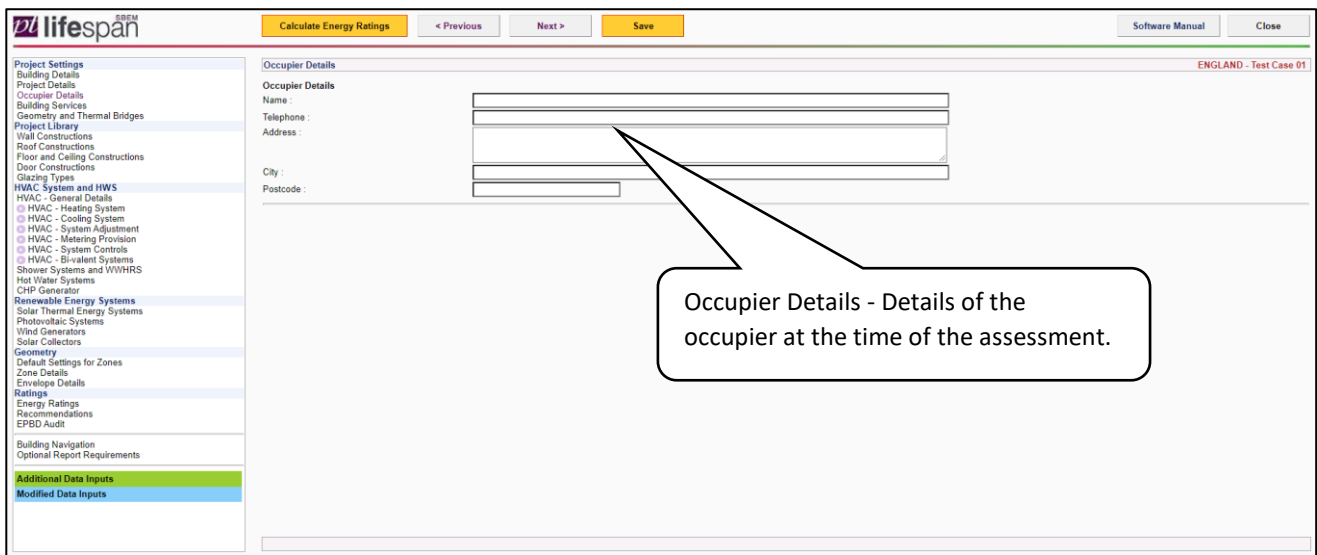
Project Complexity – SBEM is able to undertake Level 3, Level 4 and Level 5 project complexities.

Related Party Disclosure – Relates to whether the assessor has any interest in the property being assessed.

The building is a Modular or Portable Building – Tick this box to indicate whether the building is defined as Modular or Portable as defined in ADL2A. This will enable functionality relating to its specifications.

Consideration needs to be given to the use of alternative energy systems, as defined in the Regulation 25a. Tick this box to confirm and use the boxes below to select all relating systems.

Occupier Details



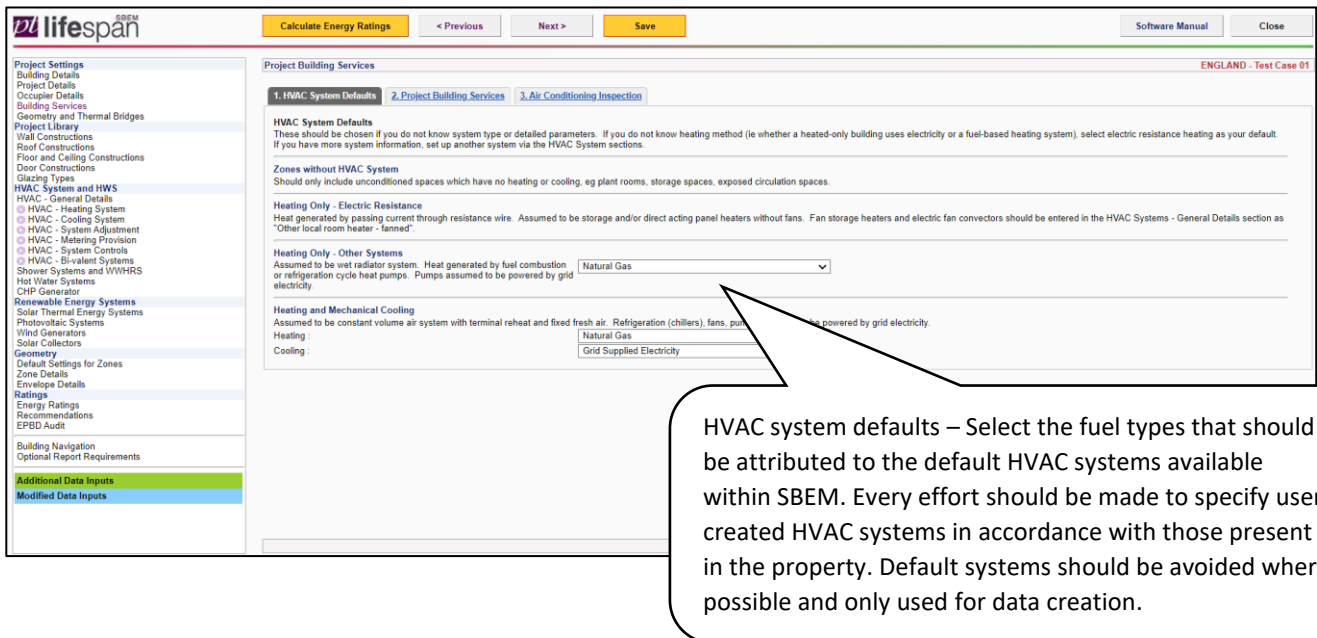
The screenshot shows the 'Occupier Details' section of the Lifespan SBEM software. The interface includes a navigation menu on the left with categories like Project Settings, Project Library, and HVAC System and HWS. The main area contains a form with the following fields:

- Name: [Text Input]
- Telephone: [Text Input]
- Address: [Text Input]
- City: [Text Input]
- Postcode: [Text Input]

A callout box with a pointer to the form contains the text: "Occupier Details - Details of the occupier at the time of the assessment."

Building Services

HVAC System Defaults



The screenshot shows the 'HVAC System Defaults' section of the Lifespan SBEM software. The interface includes a navigation menu on the left. The main area contains the following sections and options:

- HVAC System Defaults:** These should be chosen if you do not know system type or detailed parameters. If you do not know heating method (ie whether a heated-only building uses electricity or a fuel-based heating system), select electric resistance heating as your default. If you have more system information, set up another system via the HVAC System sections.
- Zones without HVAC System:** Should only include unconditioned spaces which have no heating or cooling, eg plant rooms, storage spaces, exposed circulation spaces.
- Heating Only - Electric Resistance:** Heat generated by passing current through resistance wire. Assumed to be storage and/or direct acting panel heaters without fans. Fan storage heaters and electric fan convectors should be entered in the HVAC Systems - General Details section as "Other local room heater - fanned".
- Heating Only - Other Systems:** Assumed to be wet radiator system. Heat generated by fuel combustion or refrigeration cycle heat pumps. Pumps assumed to be powered by grid electricity. Fuel type dropdown: Natural Gas.
- Heating and Mechanical Cooling:** Assumed to be constant volume air system with terminal reheat and fixed fresh air. Refrigeration (chillers), fans, pumps are powered by grid electricity. Heating: Natural Gas. Cooling: Grid Supplied Electricity.

A callout box with a pointer to the form contains the text: "HVAC system defaults – Select the fuel types that should be attributed to the default HVAC systems available within SBEM. Every effort should be made to specify user created HVAC systems in accordance with those present in the property. Default systems should be avoided where possible and only used for data creation."

Project Building Services

The Systems have Provision for Metering – Tick if lighting systems have provision for metering.

The Systems have M&T with alarms for 'out of range' values – Tick if lighting systems have M&T with alarms for 'out of range' values.

Electrical Power Factor – Select the measured electrical power factor for the property.

LENI Calculation Carried Out – Specify whether a Lighting Energy Numerical Indicator calculation has been carried out.

District Heating Parameters – For district heating systems confirm whether it is a new network and specify the CO² conversion factor and primary energy conversion factor.

Air Conditioning Inspection

Air Conditioning Inspection - Specify whether the building has an Air Conditioning System and details relating to whether it has had an inspection completed relating to the requirements of the EPBD.

Project Geometry and Thermal Bridges

Global Zone Height – Specify the most commonly occurring Zone Height.

Air Permeability Known – Specify whether the Air Permeability is known and its value at 50pa.

Number of storeys – Enter the maximum number of storeys in the building being assessed.

The screenshot shows the 'Project Geometry and Thermal Bridges' configuration page in the Lifespan SBEM software. The interface includes a sidebar with navigation options, a main content area with various input fields, and two tables for thermal bridge data.

Global Infiltration:

- Air Permeability Known:
- Air Permeability at 50pa (m³/h/m²): 3
- Building Rotation in Degrees (clockwise): 0

Geometry:

- Global Zone Height (m): 4
- Number of Storeys: 2
- Building Area (m²): 1296
- Building Foundation Area (m²): 648

Global Thermal Bridges:

Junctions Involving Metal Cladding	User Psi W/mK	QA Accredited Detail	Default Psi W/mK
Roof-wall	0	<input type="checkbox"/>	0.28
Wall-ground floor	0	<input type="checkbox"/>	1.15
Wall-wall (corner)	0	<input type="checkbox"/>	0.25
Wall-floor (not ground floor)	0	<input type="checkbox"/>	0
Lintel above window or door	0	<input type="checkbox"/>	1.27
Sill below window	0	<input type="checkbox"/>	1.27
Jamb at window or door	0	<input type="checkbox"/>	1.27

Junctions NOT Involving Metal Cladding	User Psi W/mK	QA Accredited Detail	Default Psi W/mK
Roof-wall	0	<input type="checkbox"/>	0.12
Wall-ground floor	0	<input type="checkbox"/>	0.16
Wall-wall (corner)	0	<input type="checkbox"/>	0.09
Wall-floor (not ground floor)	0	<input type="checkbox"/>	0.07
Lintel above window or door	0	<input type="checkbox"/>	0.3
Sill below window	0	<input type="checkbox"/>	0.04
Jamb at window or door	0	<input type="checkbox"/>	0.05

Global Thermal Bridges – Where Global Thermal Bridges have been calculated they can be specified here. These must be calculated by a suitably qualified person in line with ADL2A.

Area m² - Enter the total building and building foundation areas.

Project Library

Wall Constructions

Wall Name – Provide a wall name of your choosing. We recommend using a name or format that can be easily recognised when analysing information later.

Metal Cladding – For user defined values tick this box if the material incorporates metal cladding (not simply a rainscreen) and the U value has been calculated using the Combined Method (BS EN ISO 6946) for simple constructions. SBEM will make appropriate modifications to the U value entered to account for the more complex cladding calculation.

Connects Space to: Choose the typical connecting condition for this material. This can be changed at the time of creating each individual envelope if required.

Once a construction has been assigned to an envelope it will be listed in this area.

Construction Values – Choose from:

User Defined Values: this should be used where the U-value and Thermal Capacity are known. For building regulations applications values are expected to be known.

Construction Library: This will permit you to infer the values from the NCM Construction database by selecting from 2 descriptive fields.

Inference Procedures: This will permit you to infer values from the NCM Construction database according to Sector, the Building Regulations applicable at the time of construction along with a general description.

Roof Constructions

Roof Name – Provide a roof name of your choosing. We recommend using a name or format that can be easily recognised when analysing information later.

Metal Cladding – For user defined values tick this box if the material incorporates metal cladding (not simply a rainscreen) and the U value has been calculated using the Combined Method (BS EN ISO 6946) for simple constructions. SBEM will make appropriate modifications to the U value entered to account for the more complex cladding calculation.

Connects Space to: Choose the typical connecting condition for this material. This can be changed at the time of creating each individual envelope if required.

Once a construction has been assigned to an envelope it will be listed in this area.

Construction Values – Choose from:

User Defined Values: this should be used where the U-value and Thermal Capacity are known. For building regulations applications values are expected to be known.

Construction Library: This will permit you to infer the values from the NCM Construction database by selecting from 2 descriptive fields.

Inference Procedures: This will permit you to infer values from the NCM Construction database according to Sector, the Building Regulations applicable at the time of construction along with a general description.

Floor and Ceiling Constructions

The screenshot shows the 'Floor and Ceiling Constructions' configuration screen in the Lifespan SBEM software. The interface includes a sidebar with navigation options, a main configuration area, and a list of matching floors on the right. The configuration area has the following fields:

- Floor Name:** Ground
- Connects Space to:** Underground
- Construction Values:**
 - Data Source:** User Defined Values
 - U-Value (W/m²K):** 0.15
 - Thermal Capacity (kJ/m²K):** 77.7
 - The Ground Floor U-Value is Corrected:**
- Construction Library:** (Empty)
- Inference Procedures:** (Empty)

The right-hand panel shows a list of 'Matching Floors Found = 9' with the following items:

- L00circulationf
- L00Officef
- L00OfficePE1f
- L00OfficePE2f
- L00OfficePE3f
- L00OfficePNf
- L00OfficePSf
- L00Receptionf
- L00Toiletf

A callout box points to the 'The Ground Floor U-Value is Corrected' checkbox with the following text:

The Ground Floor U value is Corrected – Tick this box if the U value has been calculated in accordance with 'ISO 13370:2007 – Thermal Performance of Buildings – Heat Transfer via the Ground – Calculation Methods'. If it has been calculated in the conventional method, SBEM will modify the U value to account for the characteristics of heat loss through floors in contact with the ground.

Door Constructions

Door Name – Provide a door name of your choosing. We recommend using a name or format that can be easily recognised when analysing information later.

Once a construction has been assigned to an envelope it will be listed in this area.

Construction Values – Choose from:

- User Defined Values:** this should be used where the U-value and Thermal Capacity are known. For building regulations applications values are expected to be known.
- Construction Library:** This will permit you to infer the values from the NCM Construction database by selecting from 2 descriptive fields.
- Inference Procedures:** This will permit you to infer values from the NCM Construction database according to Sector, the Building Regulations applicable at the time of construction along with a general description.

Glazing Types

Adjusted for Horizontal Orientation – tick this box if the values are being adjusted for Horizontal Orientation.

Visible Solar Transmittance – AKA L-Solar. The fraction of solar energy that passes through the glazing system. Should refer to values for normal incidence of solar radiation, shading is accounted for in the geometry section.

Total Solar Transmittance – AKA T-Solar. Defined as the time averaged ratio of energy passing through the unshaded element to that incident upon it. Should refer to values for normal incidence of solar radiation, shading is accounted for in the geometry section.



HVAC System and HWS

HVAC – General Details

System name – The name you choose for the system. We recommend using a name you will recognise as unique to this particular system.

Show System Types – Use these buttons to filter the system types available for selection from the System Type drop-down.

System Type – Select the type of HVAC system you are specifying.

Heat Source – Select the source of the heating element of the HVAC system.

Fuel Type – Select the heating fuel.

The description of the Heat Source appears here.

A list of the zones this system is attributed to appears here.

System also uses CHP – Tick this box if the system also uses Combined Heat and Power.

Heat recovery details – Specify the appropriate heat recovery details.

Heat Recovery – If heat recovery is present, select the appropriate type.

Generator Type – Where appropriate, select the cooling generator type.

HVAC – Heating System

System Name – The systems you have created will be listed in this drop down.

Heat Source – This will mirror the details specified on the HVAC – General Details page.

The system qualifies for ECAs/ The system is older than 15 years – detailing whether the system appears on the ECA list or is over 15 years old will infer an appropriate efficiency where the seasonal efficiency is not known.

Seasonal Efficiency – Where the seasonal efficiency ratio is known specify here.

Generator Radiant Efficiency - Where the system is a radiant type specify the efficiency ratio here.

HVAC – Cooling System

Generator Type – This will mirror the details specified on the HVAC – General Details page.

Generator kW – Select the generator size. This will contribute to inferring a SEER where it is not known.

Fuel Type - Select the fuel type of the cooling system.

SEER Known – Specify the Seasonal Energy Efficiency Ratio where known. This is used to calculate energy use/ emissions.

EER Known – Specify the Nominal Energy Efficiency Ratio where known. This is used for Building regulations compliance.

The system qualifies for ECAs – detail whether the system appears on the ECA list contribute to inferring an appropriate efficiency where the seasonal efficiency is not known.

HVAC – System Adjustments

Ductwork Leakage Tested – Specify the CEN Classification of any ductwork leakage testing.

AHU Leakage Tested – Specify the Class of any ductwork leakage testing result.

Specific Fan Power – Detail the SFP where known or calculated.

If the system uses Variable Speed Pumps – Detail the applicable pumps and the sensor types used.

HVAC – Metering Provision

HVAC System - Metering Provision

System Name: HVAC 2

Controls Provision

The System has Provision for Metering:

The System has M&T with alarm for "out of range" values:

Control Correction

Heating (%): 5

Cooling (%): 5

Auxiliary Energy (%): 5

Other controls covered in the heating guide will be available in future versions.

Controls provision – Specify whether the system has Monitoring and Targeting for out-of-range values. If both are present a 5% control correction is applied to Heating, Cooling and Auxiliary Energy.

HVAC – System Controls

HVAC System - System Controls

System Name: HVAC 2

Heating System Controls

Central Time Control:

Optimum Start/Stop Control:

Local Time Control (ie, room by room):

Local Temperature Control (ie, room by room):

Weather Compensation Control:

In order to assess the impact of these controls you should modify the heat generator efficiency in accordance with the heating efficiency credits for each system type given in the Non-Domestic Heating, Cooling and Ventilation Compliance Guide.

Heating System Controls – Detail whether the system has the following controls: Central Time, Optimum Start/ Stop, Local Time, Local temperature, Weather Compensation.

HVAC – Bi-valent Systems

HVAC System - Bi-valent Systems

System Name: HVAC 2

Heat Source	Fuel Type	Seasonal Efficiency	Percentage of Heat
1		0	0
2		0	0
3		0	0
4		0	0
5		0	0
6		0	0
7		0	0
8		0	0
9		0	0
10		0	0

Bi-Valent Systems – For a Bi-Valent system specify the details of the non-primary systems here. For each additional system you must specify the; Heat source, Fuel Type, Heat Generating seasonal efficiency, Percentage of heat provided (0-100).

Shower Systems and WWHRs

Shower Systems and WWHRs

Selected Shower Name: Default

Shower Name: Default

Shower System: Standard flow

The Shower is Over the Bath:

Waste Water Heat Recovery System

WWHRs Present:

WWHRs Efficiency Known:

WWHRs Efficiency: 0.35

WWHRs Pump Present:

WWHRs Pump Nominal Power Known:

WWHRs Pump Nominal Power (W): 200

Shower System – Select the shower type from the drop-down list and tick the box if the shower is over the bath.

Waste Water Heat Recovery System – Tick the box if WWHRs is present. If so, provide details below of the efficiency and confirm if a pump is present.

Hot Water Systems

General

The screenshot shows the 'Hot Water Systems' configuration window. The left sidebar lists various system types, with 'Hot Water Systems' selected. The main panel is divided into tabs: '1. General', '2. Storage and Secondary Circulation', '3. Bi-valent Systems', and '4. Shower Systems and WHHRS'. The 'General' tab is active, showing fields for 'System Name' (HWS 1), 'Generator Type' (Same as HVAC), 'The Generator is Post 1998' (checkbox), 'Fuel Type', and 'Effective Heat Generating Seasonal Efficiency' (Efficiency Known: checkbox, Seasonal Efficiency: 0). A list of zones is visible on the right, including L00OfficePS, L00Reception, L00Toilet, L01Circulation, L01Meetingroom, L01Office, L01OfficePE1, L01OfficePE2, L01OfficePE3, L01OfficePN, L01OfficePS, and L01Toilet.

System Name – Specify a name for your system.

Generator type – Choose the appropriate generator type.

The Generator is Post 1998 – detailing this will infer a more accurate efficiency where the efficiency is not known.

Fuel type – Select the appropriate Fuel type for the HWS.

Efficiency known – detail the seasonal efficiency here where known.

This pane will detail a list of zones where the systems selected has been attributed.

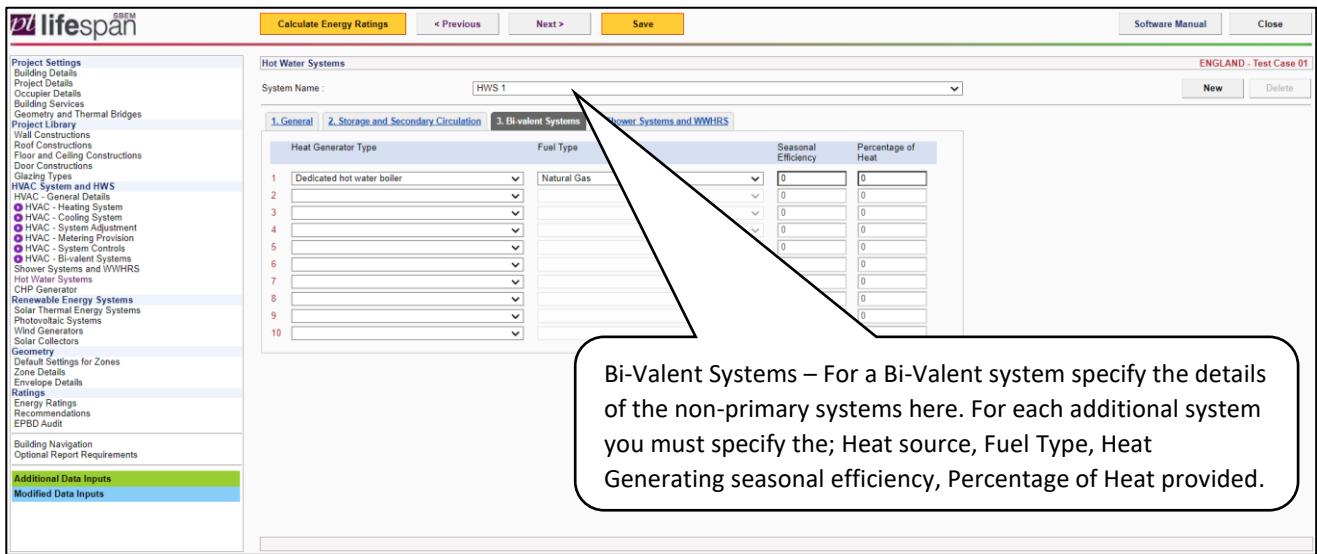
Storage and Secondary Circulation

The screenshot shows the 'Storage and Secondary Circulation' tab in the 'Hot Water Systems' configuration window. The 'Storage System' section has 'The System is a Storage System' and 'Storage Losses Known' checked. Input fields include 'Storage Volume (litres): 0', 'Insulation Type', 'Insulation Thickness (mm): 0', and 'Storage Losses (MJ/month): 1095'. The 'Secondary Circulation' section has 'The System has Secondary Circulation' and 'Secondary Circulation Parameters Known' checked. Input fields include 'Circulation Losses (W/m): 8', 'Pump Power (kW): 0.03', and 'Loop Length (m): 100'. A 'There is Time Control' checkbox is also checked.

The system is a storage system – Check this box when the system stores hot water.

Storage losses known - If you know the storage losses check this box.

Bi-valent Systems



Hot Water Systems

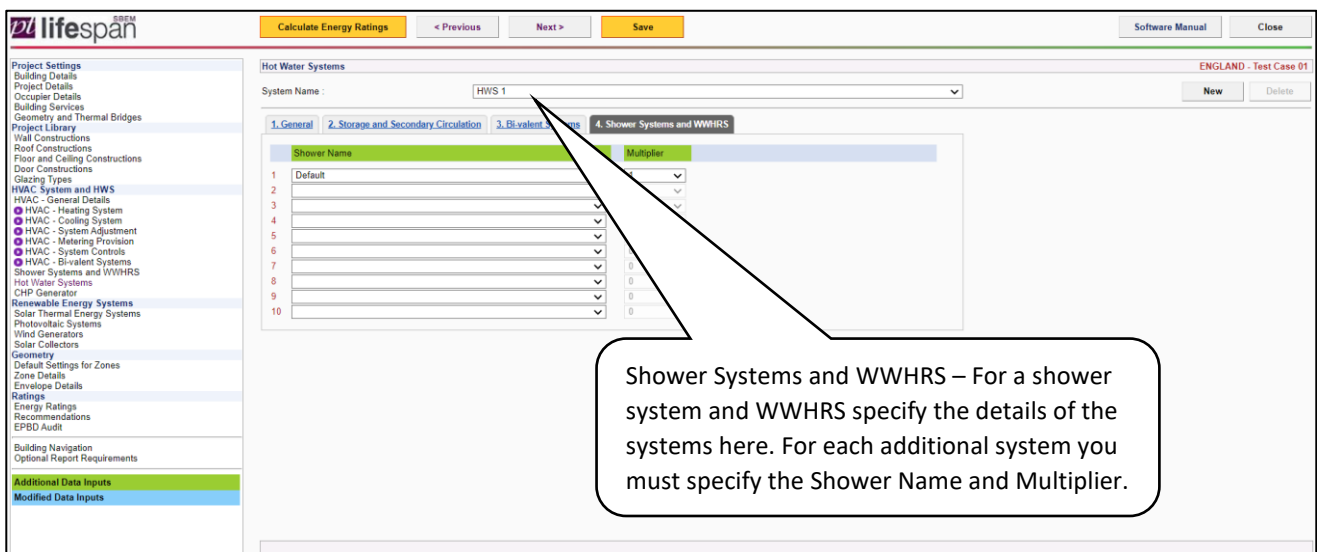
System Name: HWS 1

1. General 2. Storage and Secondary Circulation 3. Bi-valent Systems 4. Shower Systems and WWHRS

	Heat Generator Type	Fuel Type	Seasonal Efficiency	Percentage of Heat
1	Dedicated hot water boiler	Natural Gas	0	0
2			0	0
3			0	0
4			0	0
5			0	0
6			0	0
7			0	0
8			0	0
9			0	0
10			0	0

Bi-Valent Systems – For a Bi-Valent system specify the details of the non-primary systems here. For each additional system you must specify the; Heat source, Fuel Type, Heat Generating seasonal efficiency, Percentage of Heat provided.

Shower Systems and WWHRS



Hot Water Systems

System Name: HWS 1

1. General 2. Storage and Secondary Circulation 3. Bi-valent Systems 4. Shower Systems and WWHRS

	Shower Name	Multiplier
1	Default	
2		
3		
4		
5		
6		
7		
8		
9		
10		

Shower Systems and WWHRS – For a shower system and WWHRS specify the details of the systems here. For each additional system you must specify the Shower Name and Multiplier.

CHP Generator

Fuel Type - Select the Combined Heat and Power fuel type.

Heat Efficiency - Specify the Heat efficiency of the CHP unit (Useful heat/ Fuel energy).

Electrical Efficiency - Specify the Electrical efficiency of the CHP unit (Electricity generated/ Fuel energy).

Building Cooling Supplied (%) - Specify the percentage of cooling provided by the CHP system.

CHPQA Quality Index - Used for reporting. For details, please refer to HVAC Compliance Guide.

Building Space Heat Supplied - Specify the percentage of heat provided by the CHP system.

Building Hot Water Supplied - Specify the percentage of hot water provided by the CHP system.

Chiller Efficiency - Specify the efficiency of the chiller (cooling demand/ cooling energy of generator).

This is a Trigeration system - Specify whether the system also provides cooling.

Renewable Energy Systems

Solar Thermal Energy Systems

Collector Parameters

System Name - Assign your system a name.

Multiplier - Where there are multiple identical systems assign the multiplier here.

In Hot Water System - Select the HWS system served.

Area - Define the aperture area of the solar collector.

Orientation - Attribute the Orientation of the solar collector.

Angle - Define the inclination of the solar collector.

Collector Performance Parameters from EN - 12975-2 known - Check this box if details from EN-12975-2 test data are known.

Where EN - 12975-2 test data is available - specify details here.

Collector Type - Where test data is not available select the collector type.

Solar Storage and Collector Loop

Solar Storage Volume – Specify the dedicated solar storage volume.

Solar Pre-Heating type – Select the solar pre-heating type.

Insulation type – If the Pre-heating type has a separate solar store provide cylinder insulation details here.

Collector Loop – Check this box if there is a heat exchanger in the collector loop.

Overall Heat Loss Coefficient of All Pipes in the Collector Loop Known – Specify Heat Loss Coefficient of Collector Loop here.

The screenshot shows the 'Solar Storage and Collector Loop' configuration page. It includes fields for Solar Storage Volume (0), Solar Pre-Heating Type (Combined cylinder), Insulation Type, and Insulation Thickness (0). There are checkboxes for 'There is a Heat Exchanger in the Collector Loop', 'Overall Heat Loss Coefficient of All Pipes in the Collector Loop Known', and 'Heat Loss Coefficient (W/K)' (0). A sidebar on the left lists various system categories like HVAC, Renewable Energy, and Geometry.

Auxiliary Energy and Distribution Losses

Distribution Losses – Specify whether the systems distribution system is insulated.

Auxiliary Energy Consumption – Select the circulation system type.

Nominal Power of Circulation System Pumps Known – If the pump power is known specify here.

The screenshot shows the 'Auxiliary Energy and Distribution Losses' configuration page. It includes a checkbox for 'Distribution Pipes between the SES and the Back-Up Hot Water System are Insulated', a dropdown for 'Circulation System', and fields for 'Nominal Power of Circulation System Pumps Known' and 'Nominal Power of Circulation System Pumps (W)' (0). The sidebar on the left is similar to the previous screenshot.

Photovoltaic Systems

System Name – Assign your system a name.

Multiplier – Where there are multiple identical systems assign the multiplier here.

Peak Power Known – If the peak power of the system is known, tick this box and specify in the relevant field.

Type – Select the PV system type from the drop-down list.

Area – Specify the area of the PV array.

Orientation – Specify the orientation of the PV array.

Angle (degrees) – Specify the inclination (from horizontal) of the PV array.

Overshading – Detail the level of overshading the PV array is subjected to.

Ventilation Strategy – Specify the ventilation between the system and the mounting surface.

Wind Generators

System Name – Assign your system a name.

Multiplier – Where there are multiple identical systems assign the multiplier here.

Terrain Type – Specify the terrain on which the turbine will be installed.

Swept area – Select whether the turbine axis is horizontal (conventional) or otherwise.

Diameter/ Area – Complete the relevant field. If diameter is given SBEM will calculate the relevant area.

Hub Height – specify the height of the turbine hub in meters.

Power (kW) – Specify the power delivered at the rated wind speed.

Solar Collectors

System Name – Assign your system a name.

Collector Name – Select either Transpired or Non-transpired from the drop-down list and complete the details for the relevant section below.

Geometry

Default Settings for Zones

The default settings for zones page is used to select the features that most commonly occur in your project. The features set here will be used to pre-populate some of the information when generating geometry information saving input time.

Wherever possible, user specified attributes should be selected.

If an attribute is deleted subsequent to its selection in 'Default settings for zones' a replacement will need to be selected to replace it before accessing the geometry information.

For each attribute select the feature that you expect to occur most often when generating the geometry data.

Zone Details

This page will list all of the zones created for this project along with some of their key details.

New – Click this button to create a new zone. It will take you to the '1. Zone Details' page.

Copy – This button will duplicate any zones selected using the check box adjacent to each zone on this page.

Delete – This button will delete any zones selected using the check box adjacent to each zone on this page.

Zone Name	HVAC System	Building Type	Activity Type	Zone Height (m)	Floor Area (m ²)
<input type="checkbox"/> 1 L00Circulation	HVAC 1a	B1 Offices and Workshop businesses	Circulation area (corridors and stairs)	4	24
<input type="checkbox"/> 2 L00Office	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	144
<input type="checkbox"/> 3 L00OfficePE1	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	36
<input type="checkbox"/> 4 L00OfficePE2	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	36
<input type="checkbox"/> 5 L00OfficePE3	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	36
<input type="checkbox"/> 6 L00OfficePN	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	156
<input type="checkbox"/> 7 L00OfficePS	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	156
<input type="checkbox"/> 8 L00Reception	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	36
<input type="checkbox"/> 9 L00Toilet	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 10 L01Circulation	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 11 L01Meetingroom	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 12 L01Office	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 13 L01OfficePE1	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 14 L01OfficePE2	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 15 L01OfficePE3	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 16 L01OfficePN	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 17 L01OfficePS	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24
<input type="checkbox"/> 18 L01Toilet	HVAC 1a	B1 Offices and Workshop businesses	Generic Office Area	4	24

1. Zone Details

Zone name – Assign a zone name. It is useful to have a naming strategy to help identify the location and zone type.

Multiplier – Where there are multiple identical zones these may be detailed using the Multiplier feature.

Building Type – Select the Building Type from the drop-down list.

Activity Type – This is a subset of the Building Type. A brief description can be found in the adjacent box.

Local Mechanical Exhaust – Check and specify local mechanical exhaust details.

Lamp Type – Details the lamp type present within this zone.

Deadleg – detail the deadleg length within this zone.

Hot Water System – Select the Hot Water System which serves the occupants of this zone.

HVAC system – Select the HVAC system used to condition this zone.

Floor Area – Details the floor area of the zone here.

Quick Envelopes – Click this to create basic details of envelopes for this zone.

Zone Height – Specify the height of the zone. If you wish to use the project default, check the adjacent box.

Quick Envelopes - 1. Walls, Glazing and Doors

Quick Envelopes is a system we have created to assist in creating the geometry data required for each SBEM assessment quickly and easily. It is accessible through the Zone Details and Envelope Details area of the software and all details created will be generated as a subset of the zone it is accessed through. As 'Quick Envelopes' is intended to create the majority of your envelope information quickly and efficiently you may need to enter the 'Envelope Details' section separately to specify detail relating to each specific element. Details of this can be found later in this manual.

The screenshot shows the 'Quick Envelopes' software interface. The main window displays a table for defining envelope elements. The table has columns for 'Wall Orientation', 'Wall Construction', 'Connects to', 'Len (m)', 'Area (m²)', 'Glazing Type', 'Area (m²)', 'Dis-Door Type', 'Door Construction', and 'Area (m²)'. The table contains 14 rows of data. Below the table are buttons for 'Copy Selected Walls' and 'Calculate Wall Areas (Zone Height x Wall Length)'. Callout boxes provide detailed instructions for each field and button.

Wall Orientation – Specify the wall orientation of the envelope.

Wall Construction – Specify the construction of the wall envelope. This will default to that specified in 'Default settings for zones'.

Connects to – Specify the connecting condition of the envelope. This will default to that which was specified in the project library.

Len (m) – Specify the perimeter length of this envelope.

Area (m²) – Specify the envelope area.

Number of envelopes required – Specify the number of rows you require to enter your envelopes.

Copy Selected Walls – Duplicates the selected wall and assigns the opposite orientation.

Calculate Wall Area – Calculates the wall envelope using the envelope length and zone height (i.e., parallelogram). If this is not correct enter manually.

Glazing Type – Specify any glazing within this envelope.

Glazing Area – Specify the area of glazing.

Door Construction – Specify the door construction.

Door Type – Specify any door within this envelope.

	Wall Orientation	Wall Construction	Connects to	Len (m)	Area (m²)	Glazing Type	Area (m²)	Dis-Door Type	Door Construction	Area (m²)
1	East	Internal Wall	Conditioned adjoining s	6.00	24.00		0.00			0.00
2	North	Internal Wall	Conditioned adjoining s	4.00	16.00		0.00			0.00
3	South	EXTERNAL Wall	Exterior	4.00	16.00	Window	6.00			0.00
4	West	EXTERNAL Wall	Exterior	6.00	24.00	Window	9.00			0.00
5			Exterior	0.00	0.00		0.00			0.00
6			Exterior	0.00	0.00		0.00			0.00
7			Exterior	0.00	0.00		0.00			0.00
8			Exterior	0.00	0.00		0.00			0.00
9			Exterior	0.00	0.00		0.00			0.00
10			Exterior	0.00	0.00		0.00			0.00
11			Exterior	0.00	0.00		0.00			0.00
12			Exterior	0.00	0.00		0.00			0.00
13			Exterior	0.00	0.00		0.00			0.00
14			Exterior	0.00	0.00		0.00			0.00

Quick Envelopes - 2. Floors, Ceiling and Roofs

The screenshot shows the 'Quick Envelopes' window for zone 'L00circulation'. The interface includes a left-hand navigation pane, a top toolbar with 'Calculate', 'Save', and 'Cancel' buttons, and a main data entry area. The main area contains a table for defining envelope components and a list of important information.

Envelope Type - Click to add an additional Envelope Type.

Envelope Construction - Select a construction from the drop-down list.

Area (m²) - Specify the envelope area.

Connects to - Select an option from the drop-down list.

Roof Pitch - Provide details for any applicable roof envelope.

Glazing Type - Specify any glazing within this envelope.

Glazing Area - Specify the area of glazing.

Envelope Type	Envelope Construction	Connects to	Roof Pitch*	Area (m ²)	Glazing Type	Area (m ²)	Display	Important Information
Add Ground Floor	Ground	Underground		24.00			<input type="checkbox"/>	<ul style="list-style-type: none"> Wall areas should also include any glazing and doors. Internal windows and doors should not be entered into SBEM. Window lengths are now Mandatory.
Add Internal Floor	Internal Ceiling	Connected adjoining s		0.00			<input type="checkbox"/>	
Add Ceiling	Internal Ceiling	Connected adjoining s		24.00			<input type="checkbox"/>	
Add Main Roof	External	External	0.00	0.00			<input type="checkbox"/>	
Add 2nd Roof	External	External	0.00	0.00			<input type="checkbox"/>	

2. HVAC and HWS

The screenshot shows the 'HVAC and HWS' window for zone 'L00circulation'. The interface includes a left-hand navigation pane, a top toolbar with 'Previous', 'Next', 'New', 'Save', 'Quick Envelopes', and 'Close' buttons, and a main data entry area.

Destratification Fans Present - Detail whether destratification fans are present in this zone.

All other detail is as specified in Zone Details - 1.

HVAC System: HVAC System : HVAC 1a

Hot Water System: Hot Water System : HWS 1

Deadleg Pipe Length (m): 0.00

3. Ventilation

Details specified in this tab should relate to this zone specifically. Ventilation details for centralised plant should be detailed at project level in the 'HVAC Systems and HWS' area of the project library. If the centralised system incorporates terminal units in the zone these may be specified at zone level here.

Specify the ventilation type for this zone.

SFP Known – Where ventilation is mechanical, specify the Specific Fan Power (Watts per litre per second) type for this zone.

Demand Controlled Ventilation – Details whether there is any demand controlled ventilation.

Flow Regulation Type – Where mechanical, select the flow regulation type.

Activity Required High Pressure Drop Air Treatment – Details whether high pressure drop air treatment is required if known. If not, SBEM will define from NCM database.

Seasonal Efficiency Ratio – Details seasonal efficiency ratio here where known.

System has Variable Heat Recovery Efficiency – Tick box if zone has variable heat recovery.

Heat Recovery – Where mechanical, detail whether heat recovery is implemented.

4. TU and Night Cooling

System Terminal Units Specific Fan Power – Specify the specific fan power of the ventilation terminal units if known.

The Zone has Night Cooling – Specify the maximum hours of night cooling per month and maximum flow rate during night cooling if applicable.

Night Cooling Specific Fan Power – detail the specific fan power of the night cooling system if known (W/l/s).

5. Exhaust

Local Mechanical Exhaust Present
– Detail the local mechanical exhaust flow rate if present.

Exhaust SPF (W/l/s) – Detail the Exhaust Specific Fan Power if known.

Scope of Extract System – Detail the location and scope of the extract system where applicable.

Available fields in the interface include: Local Mechanical Exhaust Present (checkbox), Local Mechanical Exhaust (l/s/m²): 0.00, Exhaust Specific Fan Power (checkbox), Exhaust SFP Known (checkbox), Exhaust SFP (W/l/s): 1.50, and Scope of Extract System (dropdown menu).

6. Lighting (General)

Available Lighting Information
– Specify the level of lighting information available.

A Full Lighting Design has been Carried Out – Detail the total wattage where applicable.

Lighting has been Chosen but a Full Illuminance Calculation has Not been Carried Out – Detail the Lumens Per Circuit Watt and Light Output Ratio where applicable.

Design Illuminance Known – Detail the Design Illuminance (Lux), Lamp Type (this will only be used for recommendation purposes in this case) and whether the units incorporate Air Extraction.

Available fields in the interface include: Available Lighting Information (checkbox), Total Wattage (W): 0.00000, Lighting has been Chosen but a Full Illuminance Calculation has Not been Carried Out (checkbox), Lumens per Circuit Wattage (Unit): 95.00000, Light Output Ratio: 1.00000, Design Illuminance Known (checkbox), Design Illuminance (Lux): 100.00000, Lamp Type (dropdown menu), and Air Extracting Luminaires have been Fitted (checkbox).

7. Lighting (Controls)

Light Controls – Detail whether Local Manual Switching, Photoelectric Controls or Constant Illuminance Controls are present.

Automatic Daylight Zoning – Where zone is served by local manual switching or photoelectric switches, SBEM will automatically subdivide the zone for daylighting where selected. If your zone has a non-typical layout you may wish to manually subdivide the zone in line with SBEM methodologies.

Photoelectric Options – Specify details of the photoelectric switching where applicable.

Occupancy Sensing – Specify details of any occupancy sensors where applicable.

8. Display Lighting

Display lighting is only available where relevant to the zone activity as defined in the NCM activities database.

Time Switching for Display Lighting – Check this box where time switching is present.

The Display Lighting Uses Efficient Lamps – Specify the Lumens per Circuit Watt where energy efficient lamps are used for display lighting.

9. Solar Collectors

Calculate Energy Ratings < Previous Next > Software Manual Close

ENGLAND - Test Case 01

Zone Name: L00circulation [New] [Save] [Quick Envelopes] [Close]

1. Zone Details 2. HVAC and HWS 3. Ventilation 4. TU and Night Cooling 5. Exhaust

6. Lighting (General) 7. Lighting (Controls) 8. Display Lighting 9. Solar Collectors 10. Inf and TB

Solar Collector	Percentage of Heated Air Supplied
1	0.00
2	0.00
3	0.00
4	0.00
5	0.00

Solar Collector - Specify the solar collectors used and percentage of Heated Air Supplied for this zone.

10. Infiltration and Thermal Bridging

< Previous Next > Software Manual Close

ENGLAND - Test Case 01

Zone Name: L00circulation [New] [Save] [Quick Envelopes] [Close]

1. Zone Details 2. HVAC and HWS 3. Ventilation 4. TU and Night Cooling 5. Exhaust

6. Lighting (General) 7. Lighting (Controls) 8. Display Lighting 9. Solar Collectors 10. Inf and TB

Infiltration Use Project Default: Air Permeability at 50pa (m³/h/m²): 3.00

Thermal Bridges Use Project Defaults:

Junctions Involving Metal Cladding			
Type of Junction	User Psi W/mK	QA Accredited Detail	Default Psi
Roof-wall	0.00	<input type="checkbox"/>	0.28
Wall-ground floor	0.00	<input type="checkbox"/>	1.15
Wall-wall (corner)	0.00	<input type="checkbox"/>	0.25
Wall-floor (not ground floor)	0.00	<input type="checkbox"/>	0
Lintel above window or door	0.00	<input type="checkbox"/>	1.27
Sill below window	0.00	<input type="checkbox"/>	1.27
Jamb at window or door	0.00	<input type="checkbox"/>	1.27

Junctions NOT Involving Metal Cladding			
Type of Junction	User Psi W/mK	QA Accredited Detail	Default Psi
Roof-wall	0.00	<input type="checkbox"/>	0.12
Wall-ground floor	0.00	<input type="checkbox"/>	0.16
Wall-wall (corner)	0.00	<input type="checkbox"/>	0.09
Wall-floor (not ground floor)	0.00	<input type="checkbox"/>	0.07
Lintel above window or door	0.00	<input type="checkbox"/>	0.3
Sill below window	0.00	<input type="checkbox"/>	0.04
Jamb at window or door	0.00	<input type="checkbox"/>	0.05

Infiltration – Specify the infiltration for this zone if different to project default.

Thermal Bridges – Specify calculated thermal bridges if different to project defaults.

Envelope Details

Envelope details displays any envelopes created using 'Quick envelopes' (described earlier in this manual) and provides the ability to specify fully details of each along with the facility to create them from scratch. We recommend creating envelopes using the 'Quick envelopes' facility and making any amendments/additions at a later time.

Zone Name – Select the Zone that you would like to create/ amend envelopes for.

Envelope Name – Click on an existing envelope name to edit the envelope.

Details of each envelope is summarised here.

New – Click 'New' to create a new envelope in the zone selected.

Copy – Click this button to copy any envelopes selected using the check boxes.

Delete – Click this button to delete any envelopes selected using the check boxes.

Quick Envelopes – Click this to open the envelopes in 'Quick Envelopes'. You will not be able to specify full envelope details in this facility.

Envelope Name	Construction	Area (m ²)	Glazing Type	Glazed Area (m ²)	Door Construction	Door Area (m ²)
1 <input type="checkbox"/> L00circulation/ci	Internal Ceiling	24				
2 <input type="checkbox"/> L00circulation/f	Ground	24				
3 <input type="checkbox"/> L00circulation/ei	Internal Wall	53				
4 <input type="checkbox"/> L00circulation/ni	Internal Wall					
5 <input type="checkbox"/> L00circulation/s	EXTERNAL Wall	16	Window	6		
6 <input type="checkbox"/> L00circulation/w	EXTERNAL Wall	24		9		

Edit Envelope Details

Envelope Details

The image shows a software interface for editing envelope details. The form is titled 'Envelope Details' and contains several sections with input fields and checkboxes. Callout boxes provide instructions for each field:

- Envelope Name** – Give the envelope a name of your choosing.
- Multiplier** – Where there are multiple identical envelopes these may be detailed using the Multiplier feature.
- Orientation** – Specify the orientation of the envelope.
- Envelope Type** – Specify the type of envelope.
- Loft access** – Tick to confirm whether loft access is available.
- Zone Height/Wall Length/Area** – Specify the measured geometry here.
- Solar Collector** – Specify solar collector details for this envelope.
- Additional Thermal Bridges** – Specify details of thermal bridges for this envelope here.
- Roof Pitch** – Where relevant, detail the roof pitch here.
- Construction** – Select the construction type.
- Connects to** – Detail the connecting condition.

The form fields include: Zone Name, Envelope Name, Multiplier (dropdown), Orientation (dropdown), Envelope Type (dropdown), Roof Pitch (text), Construction (dropdown), Connects to (dropdown), Zone Height (m) (text), Wall Length (m) (text), Solar Collector (checkbox), and Additional Thermal Bridges (checkbox). A 'Calculate Wall Area' button is also present.

Glazing Details

Multiplier – Where there are multiple identical envelopes these may be detailed using the multiplier feature.

Surface Area Ratio – Specify the surface area ratio (developed area to projected area – for domed or conical windows this will be greater than 1).

Glazed area – Specify the area of the glazing unit.

Area ratio covered – For a rooflight is defined as the area of an array of roof lights to the area of glazing.

Opening Type – Select area type from the drop-down list provided.

Display window – Tick this box if the window is used for display purposes as defined in ADL2.

Frame factor – Ratio of frame to glazing area.

Aspect ratio – Ratio of height to width of window.

Transmission factor – Fraction of light transmitted through window after accounting for shading from overhangs and fins.

Shading Position/ Colour/ Translucency – Specify any shading details.

Additional Thermal Bridges – Specify details of thermal bridges for this envelope here.

Door Details

Multiplier – Where there are multiple identical envelopes these may be detailed using the multiplier feature.

Door Type/Construction – Select door details from the lists provided.

Door Area – Specify area details.

Additional Thermal Bridges – Specify details of thermal bridges for this envelope here.

Ratings

Energy Ratings

This page details the calculated results of SBEM after pressing the ‘Calculate Energy Ratings’ button. The results displayed will change depending on the assessment type. A limited number of relevant reports is also available.

The screenshot displays the 'Energy Ratings' section of the Lifespan SBEM software. It includes a table for 'EPC England' showing Primary Energy Use (kWh/m²/year) for Heating, Cooling, Auxiliary, Lighting, and Hot Water, along with a TOTAL. Below this is a table for 'kg CO₂/m²/year' showing Part L TER, Typical, SER, BER, and EPC Rating. A bar chart shows energy efficiency ratings from A (0-25) to G (Over 150), with a reference line at 50. The current rating is 19, which is highlighted in yellow and corresponds to band A.

EPC England		Primary Energy Use (kWh/m ² /year)					TOTAL
		Heating	Cooling	Auxiliary	Lighting	Hot Water	
Actual Building :		4.48	8.31	15.65	14.74	2.6	45.78
Notional Building :		3.85	5.85	9.76	11.85	2.6	33.71
Reference Building :		48.28	25.52	2.62	44.26	5.78	126.47

kg CO ₂ /m ² /year :	Part L TER	Typical	SER	BER	EPC Rating
	4.6	18.3	16.1	6.2	
Band :	A	C	B-C	A	19

Recommendations

Once a project has been calculated all applicable SBEM generated recommendations will be listed along with their Energy and CO₂ Impact, CO₂ saved, Payback Time and Payback Years. Only those listed as applicable to the ‘building’ will appear on the lodged report that accompanies the EPC.

User recommendations can be added by clicking ‘New’. All fields must be completed in order for the recommendation to be successfully passed to the SBEM engine for inclusion in the report.

For any amendments (including ‘User’ recommendations) to be included in the Recommendations Report, the ‘Update Recommendations Report’ button must be the last button pressed before closing the project.

Ex-clude	Edit	Category	Code	Recommendation Text	Applicable To	Energy Impact	CO ₂ Impact	CO ₂ Saved	Payback Time	Payback Years
<input type="checkbox"/>	<input type="checkbox"/>	lighting	EPC-L5	Consider replacing T8 lamps with retrofit T5 conversion kit. (reworded)	building	medium	high	good	short	1.8
<input type="checkbox"/>	<input type="checkbox"/>	lighting	EPC-L7	Introduce HF (high frequency) ballasts for fluorescent tubes. Reduced number of fittings required	building	low	low	fair	medium	3.5
<input type="checkbox"/>	<input type="checkbox"/>	renewables	EPC-R2	Consider installing building mounted wind turbine(s)	building	low	low	poor	long	15.9
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H2	Add time control to heating system	building	low	low	poor	long	17.3
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H2	Add time control to heating system	HVAC 2	low	low	poor	long	17.3
<input type="checkbox"/>	<input type="checkbox"/>	renewables	EPC-R3	Consider installing solar water heating	building	low	low	poor	long	20.2
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H7	Add optimum start/stop to the heating system	building	low	low	poor	long	24
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H7	Add optimum start/stop to the heating system	HVAC 2	low	low	poor	long	24
<input type="checkbox"/>	<input type="checkbox"/>	renewables	EPC-R4	Consider installing PV	building	low	low	poor	long	44
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H6	Add local temperature control to the heating system	building	low	low	poor	long	46
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H6	Add local temperature control to the heating system	HVAC 2	low	low	poor	long	46
<input type="checkbox"/>	<input type="checkbox"/>	cooling	EPC-C3	Ductwork leakage is greater than 10%. Inspect and seal ductwork	HVAC 2	low	low	poor	long	46.1
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H8	Add weather compensation controls to heating system	building	low	low	poor	long	48
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H8	Add weather compensation controls to heating system	HVAC 2	low	low	poor	long	48
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H5	Add local time control to heating system	building	low	low	poor	long	55.6
<input type="checkbox"/>	<input type="checkbox"/>	heating	EPC-H5	Add local time control to heating system	HVAC 2	low	low	poor	long	55.6
<input type="checkbox"/>	<input type="checkbox"/>	cooling	EPC-C3	Ductwork leakage is greater than 10%. Inspect and seal ductwork	building	low	low	poor	long	76.9
<input type="checkbox"/>	<input type="checkbox"/>	cooling	EPC-C1	The default chiller efficiency is chosen. It is recommended that the chiller system be investigated to gain an understanding of its efficiency and possible improvements	building	unknown	unknown	unknown	unknown	0
<input type="checkbox"/>	<input type="checkbox"/>	cooling	EPC-C1	The default chiller efficiency is chosen. It is recommended that the chiller system be investigated to gain an understanding of its efficiency and possible improvements	HVAC 2	unknown	unknown	unknown	unknown	0

NB: Only those Recommendations which show 'building' in the 'Applicable To' column will be included in the Main Recommendations Report. All other Recommendations will only appear in the Secondary Recommendations Report.

Building Regulations Compliance

If you have selected one of the Building Regulations Compliance selections from the 'Purpose of Analysis' drop down on the 'Building Details' page then the 'Energy Ratings' screen will not display the Asset Rating (EPC rating) of the property rather, it will display details relating to the compliance criteria required for Building Regulations in the region selected.

While SBEM reports on most aspects of Part L assessments, reference should be made to the relevant Regulations document to ensure all requirements are fulfilled.

Part L England

England Building Regulations Part L 2021

	Primary Energy Use (kWh/m ² /year)					TOTAL
	Heating	Cooling	Auxiliary	Lighting	Hot Water	
Actual Building :	4.48	8.31	15.65	14.74	2.6	45.78
Notional Building :	3.65	5.85	9.76	11.85	2.6	33.71

CO ₂ Emissions (kg CO ₂ /m ²)	
Actual Building Emission Rate (BER) :	5.2
Notional Building Emission Rate :	4.58
Target Emission Rate (TER) :	4.58
Pass CO ₂ Emissions Requirement (BER <= TER) :	NO

Main SBEM Reports

- Compliance with England Building Regulations Part L
- Additional Details Report
- SBEM Main Output Document

For Part L checks in England the key Criterion that is checked by SBEM is that the 'Building Emission Rate' (BER) is less than the 'Target Emission Rate' (TER).

SBEM also reports on other criterion such as back stop U- Values etc. These are reported within the compliance report.

EPBD Audit

This area gives the assessor the opportunity to detail any notes they would like to record against their project and is specifically provided for auditors to reference against EPC lodgements. Although the detail is not mandatory it is of great benefit to any auditor.

The screenshot shows the 'EPBD Audit' section of the software. It includes a sidebar with a tree view of project settings. The main content area is titled 'EPBD Audit' and has tabs for '1. Construction', '2. Geometry', '3. HVAC and HWS', and '4. Lighting'. Under the 'Construction' tab, there is a section for 'Construction' with the instruction: 'Please produce concise supporting evidence for over-writing default values'. Below this are several input fields: 'Accept Default:', 'Assessor walk-through Inspection:', 'Inspection by Others -', 'On-site measurements of input parameters for assessment:', 'Design or as-built documentation:', 'Other Sources:', and 'Comments:'. Each of these fields has a small icon in the top right corner, likely for help or validation.

Building Navigation

This page offers a summary of information entered into the project accessible in a single area.

The screenshot shows the 'Building Navigation' section. It features a summary table for 'Area Checks' and a table for 'Object Types'. Below these is an 'Object Tree' and an 'Object Details' panel.

Area Checks		Object Types	
Building Area (m ²):	1296	(h) HVAC System	(r) Roof
Total Floor Area (m ²):	1296	(z) Zone	(g) Glazing
Total Zone Area (m ²):	1296	(w) Wall	(d) Door
Total Number of Zones:	18	(f) Floor or Ceiling	
Total Ceiling Area (m ²):	648		
Total Roof Area (m ²):	648		

Object Tree

- (h) HVAC 2
 - (z) L00circulation
 - (z) L00Office
 - (z) L00OfficePE1
 - (z) L00OfficePE2
 - (z) L00OfficePE3
 - (z) L00OfficePN
 - (z) L00OfficePS
 - (z) L00Reception
 - (z) L00Toilet
 - (z) L01circulation
 - (z) L01Meetingroom
 - (z) L01Office
 - (z) L01OfficePE1
 - (z) L01OfficePE2
 - (z) L01OfficePE3
 - (z) L01OfficePN
 - (z) L01OfficePS

Unassigned Zones = 0 Zones with Bad Area Checksum = 0 Zones Missing Envelopes = 0

Optional Report Requirements

Please specify which reports you would like Lifespan SBEM to make available after the calculation. This must be specified before the calculation engine is run (i.e. before the 'Calculate Energy Ratings'/ 'Update Recommendations Report' button is pressed).

Optional Report Requirements

ENGLAND - Test Case 02

SBEM Main Output Document :

Data Reflection Reports :

Risk of Overheating Report :

Technical Output Reports :

Input Data Files (SBEM, EPCgen, BRUKL and BBL11) :

Address Search

Building Details

ENGLAND - Test Case 02

Purpose of Analysis : EPC England

Building Name : ENGLAND - Test Case 02

Building Type : B1 Offices and Workshop businesses

Address : Street 02

City : St Albans

Postcode : AL1 3ER

UPRN (prefixed with UPRN- followed by 12 digits) : UPRN-000000000000

Inspection Date : 28/11/2017

The Building is of Special Conservation Status :

Optional Address Formatting

Move Address Fields (1-3) Down One Line

Remove Duplicate City Name from Address Fields (2-4)

If the purpose of analysis is an EPC (any region) the address must be obtained from the relevant central register. Clicking in the Address or 'UPRN' field on the 'Building details' page will bring up a pop-up box to search for the address. This links directly to the central register and will look something like the following.

SEARCH IN
 England, Wales & Northern Ireland

SEARCH BY
 Postcode

POSTCODE

BUILDING NAME/NUMBER
 optional

Search

Select the applicable region from the drop-down list.

You can search by either 'Postcode' or 'Street Name & Town'.

Fill out the relevant details and click 'Search'.

SUITE 23 THIRD FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITE 24 FIRST FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITE 25 FIRST FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITE 32 THIRD FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITE 33 THIRD FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITE 34 THIRD FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

SUITES 34, 35 & 36 FIRST FLOOR, LOWRY MILL, LEES STREET, SWINTON, M27 6DB

Use Selected Address

Search Again

Address not appearing? [Manually enter one](#)

A list of possible addresses will be displayed. Click on the correct address to select it and click 'Use Selected Address' to apply to your assessment.

If you have searched for an address and it does not appear in the list, you can manually enter one using this link. Ensure that you have checked for an existing property before creating a new one to avoid duplications.

Click 'Search Again' to return to the initial search screen.

Part L (Conservation of Fuel and Power) in Wales

There are various differences in the technical requirements under Part L in relation to dwellings between England and Wales.

A summary of the changes are provided below, however Energy Assessors should refer to the official Part L documents.

Summary of differences in Part L between England and Wales:

AD L2A

- Reference is made to enhanced energy management.
- In table 2 the TER factors for modular buildings are different.
- The guidance on building service controls has changed.
- There is a Regulation 25C(a) New Buildings – min energy requirements. This makes reference to the Welsh Ministers approval so would only apply in Wales.

AD L2B

- Consequential Improvements, the 1000m² restriction has been removed.
- Table 1 for the 'U' values to walls and roofs, the values are slightly lower.
- More attention is given to air gaps in insulation etc.
- There is a new Table giving the 'U' values for replacement doors and windows.
- There is a new section giving guidance on new or replacements doors and windows.
- There is a new section giving guidance on non-exempt conservatories and porches.

Essential Reading

- SBEM Technical Manual
- NCM

Recommended Reading

- iSBEM Manual
- ND EPC Conventions
- HVAC Compliance Guide
- ADL2A
- ADL2B
- CIBSE Guide A