Non-Domestic Energy Assessment Procedure

BER Publication and Survey Guide

VERSION: 2.0

NEAP is the official procedure for the calculation of energy performance of non-domestic buildings in Ireland for the purposes of producing Building Energy Ratings (BER) and demonstrating compliance with Part L of the Building Regulations for Non-Domestic Buildings.

This document describes the NEAP survey and BER publication methodology for non-domestic buildings. The NEAP Manual (iSBEMie User Guides) detailing the assessment methodology for non-domestic buildings must be followed alongside this document.

BER Assessors, building designers and other users must ensure that they are using the latest version of this document and accompanying software. Information and any updates will be published on the SEAI website at https://www.seai.ie/energy-in-business/ber-assessor-support/

As outlined in the Code of Practice, full site surveys are to be carried out for "New-final" or "Existing" building assessments and for elements constructed / installed in "New-provisional" ratings.

"New-provisional" ratings are applicable where a building is sold and/or leased based on design plans and specifications of the building, typically no site survey is required. However, for Shell and Core buildings, a site survey must be carried out to verify the constructed elements, for example walls, roofs etc. and what has been installed, for example landlord services.

A BER Assessor is required to act with integrity and diligence to ensure that each BER assessment is executed competently, in an independent manner and in accordance with the Regulations, the BER Assessor's Code of Practice and all other directions issued by SEAI. In this regard a BER Assessor is responsible for ensuring that, within reason, the data compiled and inputted to SEAI approved calculation software and all other related and recorded calculations are an accurate representation of all characteristics relevant to the energy performance of the building and are capable of being verified as such in any subsequent monitoring and compliance processes commenced by SEAI in accordance with the BER Quality Assurance System and Disciplinary Procedure.

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1 Introduction

This guide is designed to assist Building Energy Rating (BER) Assessors to carry out BER assessments on non-domestic buildings using iSBEMie or other approved software[1].

This manual does not replace the iSBEMie User Guides, NEAP Modelling Guide or iSBEMie Technical Manual. It provides additional guidance relating specifically to documentary evidence and surveying of non-domestic buildings and should be read in conjunction with the iSBEMie User Guide, NEAP Modelling Guide and SBEMie Technical Manual or other guides associated with the approved software being used by the Assessor.

In addition to providing guidance on the surveying of buildings, this Survey Guide indicates the necessary supporting data or evidence required when completing BER assessments on buildings, particularly when using values other than the defaults.

The current published version of the NEAP BER Publication and Survey Guide is available on SEAI website.

When conducting a survey, BER Assessors must comply with the Safety, Health and Welfare at Work Act 2005 and regulations under that Act, as well as all other applicable health and safety legislation, regulations, codes and guidelines. It is the BER Assessor's duty to make himself or herself familiar with the relevant health and safety rules, to exercise due diligence during the survey and to prevent unreasonable risk of harm or injury. Please refer to the Health and Safety Authority website for further information: www.hsa.ie .

BER Assessors are solely responsible for undertaking surveys in a safe manner. The BER Assessor should under no circumstances expose himself or herself, or any other person, to unnecessary risks of harm or injury in conducting a building survey. The BER Assessor must be mindful at all times of health and safety issues and, where the BER Assessor has reason to believe that obtaining any of the information set out in this document, or any other associated guidance provided by SEAI, may involve such risks, the BER Assessor need not and must not attempt to obtain that information.

SEAI and its agents accept no liability or responsibility for any damage, injury, death, breach of contract or negligence in respect of any dispute, claim or cause of action arising out of, or in relation to, any BER assessment.

[1] Throughout this Guide, the term "Approved Software" is used to denote iSBEMie and other SEAI approved BER software as published on the SEAI website.

Assessors who have been accredited to use alternate software should note the following:

- Non default values should be used where possible, however where these cannot be substantiated default values must be used. The default values to be used are as outlined in the iSBEMie User Guides, iSBEMie software and this NEAP Survey Guide. It is the responsibility of the assessor to ensure that any defaults used in alternate software comply with the iSBEMie software and aforementioned documents. Third party software does not necessarily use or provide the same defaults as iSBEMie.
- In all cases, the methodology outlined in the iSBEMie User Guides, and this NEAP Survey Guide takes precedence over guidance from third party software.

Surveys are expected to be non-invasive. Nothing in this document, the iSBEMie User Guides or any other associated guidance provided by SEAI, shall be understood as requiring invasive surveys. Where, despite this, BER Assessors or their client carry out invasive surveys this is carried out at the BER Assessor's and the building owner's own risk and is not required by SEAI.

If invasive survey methods are used such as to demonstrate non-default data, then, while these methods are not required in the BER assessment methodology, they can be considered as a source of supporting evidence. This supporting evidence for each relevant exposed surface must clearly indicate that the non-default data being specified is appropriate for the building element in question.

Where the survey requires access to the Building Management System (BMS), the Assessor should seek out assistance from the Facilities Manager/ Building Operator and take due care and consideration not to interfere with the setup of the BMS.
BER Assessors are required to adhere to the BER Assessor's Code of Practice at all times and the definitions in the iSBEMie Manual must be followed at all times.

The survey guide should be read in conjunction with the following documents

- iSBEMie_User_Guide_Vol 1: Basics
- iSBEMie_User_Guide_Vol 2: Compliance
- iSBEMie_User_Guide_Vol 3: BER
- Non-Domestic Energy Assessment Procedure – Modelling Guide
- BER Assessors Code of Practice
- BER Quality Assurance System and Disciplinary Procedure
- NEAP Guidance Document

Information required on Building Regulations Part L (current or previous) is provided on the Department of Housing, Planning and Local Government website.

A Building Energy Rating is required under the following circumstances:

- When a new or existing building is offered for sale (or let) a BER certificate and accompanying advisory report must be produced by the vendor or their agent (e.g. auctioneer, estate agent or solicitor) to potential buyers or tenants.
- When a new building is offered for sale "off plans" a Provisional BER certificate and accompanying advisory report must be produced by the vendor to potential buyers or tenants, based on the pre-construction plans; and when the same new building is completed, a BER certificate must be supplied to the purchaser, based on a survey of the buildings as constructed (to take account of any changes during construction).
- When a new building is built for a specific owner-occupier: A BER certificate and accompanying advisory report must be procured by the person commissioning the building, prior to taking up occupation of the building.
- A person offering a property for sale or rent, or their agent, shall ensure that the energy performance indicator of the current BER certificate for the building is stated in any advertisements, where such advertisements are taken relating to the sale or letting of that building.
- Prospective buyers and renters will be shown the BER rating (Alphanumeric value) along with other prescribed content (dependent on the particular medium) in a prominent location in each specific advertisement

- Where images of the property are used then the presentation of the alphanumeric value will be by way of the prescribed BER Alphanumeric Rating Motif for the particular property rating

The types of Building Energy Rating required are as follows:

1. New Building – Provisional Rating: A rating published on the basis of the plans and specifications for a proposed construction or a shell and core building.
2. New Building – Final Rating: A rating published for a building where construction is complete and has not been sold or occupied previously.
3. Existing Building – Final Rating: A rating published for a building where construction is complete and it has been sold or occupied previously.

2 Pre-survey Information Request

Prior to carrying out the survey, the Assessor should formally request from the building owner/representative information such as:

- Age of building;
- Details of planning permission (reference, date);
- Access to architectural drawings and specifications for layout configuration and details of construction;
- Access to any mechanical and electrical drawings and specifications to assist the Assessor in determining the nature of the equipment installed;
- Details of building type and activities within the Building;
- Details of any modifications made in the building e.g. insulation upgrading, additional/upgraded controls, new lighting, new boilers, additional equipment, extensions, etc.;
- Certification to prove that the ducting was pressure tested;
- If the HVAC system is separately sub-metered and if so, where the meters are located;
- Any other information related to the heating, cooling, ventilation and air conditioning (HVAC) systems which may not be obvious but may have an impact on the BER;
- Any additional documentary evidence that the owner feels is important.

Where such information is available, documentary evidence should be obtained (rather than verbal briefing). Any documentary evidence of upgrading must clearly relate to the building concerned and must be sufficiently detailed in its scope. The substantiation that would be acceptable for QA audit purposes is detailed in Section 7 of this document and where such evidence is used for BER purposes, a copy of this evidence must be retained by the Assessor and provided to the SEAI BER QA auditors on request.

The Assessor should inform the owner in writing that access to all areas in the building including boiler rooms, any hatches which provide access to insulation, controls and pipework will be required in order to carry out the survey.

3 Survey Documentation and Equipment

A number of items should be brought to the survey site to enable the successful conduct of the survey of the building. These include (but are not limited to):

Documentation:

- Approved Software Manual;
- NEAP BER Publication and Survey Guide;
- The NEAP Survey Form (Appendix 1), or similar data collection sheet/drawings (also available in electronically editable format on www.seai.ie/energy-in-business/ber-assessor-support/neap/

- Pencil, paper and eraser;
- Graph Paper (for sketching building plans and elevations);
- Architectural plans for the building where available;
- Any other available specifications for the building.

Equipment:

- Measuring tape. Electronic measuring devices may be used, provided all measurements are accurate and the equipment is properly calibrated;
- Calculator;
- Directional compass;
- Flashlight;
- Camera with flash (with macro capability to ensure text is clearly legible);
- Key for electricity meter and key for gas meter (standard tools will not open gas or electricity meters);
- Ladder (to facilitate inspection of ceiling voids and access to any roof where plant is located);
- Personal protective equipment as necessary.

4 Data Gathering

For all data gathered, supporting documentary evidence is required to substantiate any entries in the NEAP software. This documentary evidence must be retained by the Assessor as outlined in the BER Assessor's Code of Practice. BER Assessors must endeavour to gather as much data, photographs and supporting evidence as possible to increase the likelihood of an accurate survey and assessment which will stand up to auditing by SEAI.

The list of supporting evidence detailed in this guide is for guidance purposes and will be added to over time. Other methods/supporting data may be considered by SEAI on a case by case basis, as they arise.

Where "As Built" drawings and specifications are available for a building, it is the responsibility of the Assessor to verify that the data is accurate through a site survey and to ensure that any data input into the NEAP software is accurate. In verifying "As Built" drawings, assessors should have documentary evidence from the site survey to support the drawings, for example; marked up drawings showing measurements on site, photographs and completed survey forms from site survey. "As Built" drawings shall be suitably marked by the contractor to indicate they are prepared by the contractor.

"Issued for Construction" drawings can also be used as documentary evidence to support a BER, however the "Issued for Construction" drawings must be supplemented with documentary evidence from a site survey.
For example an Assessor has "Issued for Construction" drawings from the M&E consultant detailing the lighting installation. The Assessor should provide additional information to substantiate that the lighting was installed as per the "Issued for Construction" drawings. This should be:

- Photographs of the light fitting as installed.
- Survey Sheet detailing the light fittings as installed.

For Shell and Core buildings,

- Where an element has been constructed, documentary evidence for that element is as per New Final or Existing Buildings
- Where an element has not been completed or installed, documentary evidence is as per the New Provisional requirements, ie "Design" drawings and specifications may be used.

If clarification is required by the BER Assessor, specific queries related to the acceptability of supporting documentary evidence should be directed to the BER Helpdesk prior to the publication of a rating.

The NEAP Survey Form (Appendix 1) assists Assessors in ensuring that they have gathered all the necessary documentary evidence during the survey of a building. This includes data regarding the dimensions, building age, building fabric elements, relevant items per room, HVAC system(s), hot water services, HVAC controls, lighting and lighting controls. This should be accompanied by building sketches/architectural drawings and comments related to various aspects of the site survey.

In addition to the above, the assessor must provide photographic evidence to support data gathered during the survey of the building as detailed in Section 7 of the Survey Guide. Assessors should reference the photograph applicable to each zone on the survey form, for example:

ZONES: BUILDING SERVICES DETAILS					
Zone name	**Description**	**Building type**	**Activity#**	**Area m2**	**Height m**
z0/01	Open Plan Office Photos 001 - 005	Office	Open Plan Office	100	3.5
z0/02	WC Photos 006	Office	Toilet	10	3.5

The reference used on the survey form should correlate to the name of the photograph filename supplied as documentary evidence during the audit process.

Photographs must be clear. Assessors should read the camera's manual to gain a full understanding of how the camera is operated, paying particular attention to the use of flash, macro and focus.
The following simple tips should also be adhered to:

- Ensure that the camera is set up correctly prior to taking the photograph. It is important to ensure that adequate resolution is set up.
- Hold the camera steady;
- Give the camera time to focus;
- For close-up shots, the camera's macro function may take several seconds to gain correct focus;
- Use the flash in poorly lit spaces (the camera's auto-flash setting will do this automatically, generally with good results);
- When using the flash on an object several metres away try to ensure there are no objects in the foreground as this can affect the focus and/or over-expose the photograph;
- Check the photograph. If it is not of sufficient quality, retake the photograph.

4.1 External Survey

An initial survey of the outside of the building should be carried out. The following information can be gathered by external survey:

- External measurements to establish/check the overall footprint of the building. External measurements must be converted to internal measurements before calculating floor area and heat loss areas;
- Establishing ventilation features such as number of vents, extract fans, air intakes and external air handling plant;
- Assessing age band indicators, such as meter box date information;
- Confirming the orientation of the building using a directional compass;

- Establishing which walls of the building are party walls and determining, as far as possible, the nature of the activity of the adjoining buildings;
- Establishing shading characteristics;
- Details of any renewable technologies, such as solar panels and wind turbines;
- Establishing any external plant rooms/ energy centres serving the building.

4.2 Internal Survey

An initial walk around inside the building is very useful and assists in determining the following information:

- Confirming the Building Activities;
- Confirming the various HVAC systems within the building;
- Confirming the various Lighting and Lighting Control systems within the building;
- Confirming heat loss envelope elements such as ground floor type(s), wall types, window variations and in completing survey sketches for each floor, zone, wall and other element types;
- Assessing age band indications such as date stamp in the gap within double/triple glazing;
- Confirming the ventilation as indicated from outside the building.
- Identifying internal elements with high thermal mass composition.
- Identifying elements adjoining unconditioned spaces.

4.3 Building Sketches and Architectural Drawings

A sketch of the building must be made showing plans and elevations. Where architectural drawings are available, these can be used instead of sketches, provided any differences between the architectural drawings and actual measurements taken on site are noted on the architectural drawings by the BER Assessor. The original sketches and/or architectural drawings must be kept on file as supporting evidence for the BER assessment. The dimensions used in the NEAP assessment should reflect the actual measurements taken during the survey. Sketches/drawings, combined with the Survey Form and other evidence as outlined in this document, are required to support data entered in the data file to complete a BER assessment using the iSBEMie or other software.

As a guide, the sketches/drawings should at least indicate the following:

- Each zone entered in NEAP software;
- Activity in each zone
- Different walls, floors and roof types;
- Dimensions (total floor area, zone areas, wall thickness, floor heights, element dimensions);
- Unconditioned spaces – identifying elements between conditioned and unconditioned spaces;
- Adjacent buildings (beside party wall);
- Openings:
  - Door types, dimensions and orientations (with estimate of percentage glazing);
  - Window dimensions and orientations;
  - Type(s) of glazing (e.g. single glazed, double glazed, any information about filling or glazing type);
  - Opening frame type(s) (PVC, Wood, metal and evidence of thermal break if possible, to determine);
  - Measured gap between panes if possible, not including the thickness of the glazing panes;
  - Overshading estimate on each opening;
- Extensions/ alterations to the building – identifying where the age of the building differs.

4.4 Floor by Floor Survey

A sketch or architectural drawing must be provided for each floor showing partitions, wall openings and zones. Where architectural drawings are used, it is the responsibility of the Assessor to ensure the accuracy of the drawings in relation to the finished construction; therefore, architectural drawings must be altered to reflect changes in the finished building.

Each room/area must be checked for the following:

- Activity in each area;
- Type of HVAC in each area and how it is controlled;
- Type of lighting and how it is controlled;
- Any additional ventilation, separate to the main HVAC system in each area;
- Properties of openings such as:
  - Type of glazing (double, single, triple, stamp/brand on windows);
  - Dimensions;
  - Frame type;
  - Gap between glazing;
  - Overshading;
  - Orientation;
- Room heights.

This information should all be collected in the NEAP Survey Form (Appendix 1).

Refer to Appendix 2 of this document for Guidance on Zoning, Appendix 3 for a List of Activities and Appendix 6 for examples of zone height calculation.

4.5 Plant Room Survey

Each plant room should be surveyed with particular reference to the following.

- Boiler plant;
- Refrigeration plant;
- Air handling units;
- Fans;
- Calorifiers (hot water system);
- Heat exchangers;
- Heat recovery equipment;
- Controls related to all building services plant.

For all plant items, e.g. boilers, refrigeration equipment, air handling units, fans, humidifiers, heat recovery units, heat exchangers, hot water calorifiers, pumps, nameplate details must be recorded where accessible and a photo must be taken to facilitate later identification of the equipment concerned in support of data entered in the data file.

4.6 Ceiling and Floor Voids

Accessible ceiling and floor voids must be inspected to determine what equipment, particularly HVAC equipment, is present. This provides useful information as to the type of HVAC used in the building. Where possible, photos should be taken to demonstrate the HVAC systems present. Accessible ceiling includes for ceilings where ceiling tiles can be lifted.

4.7 Attic Spaces

Useful building compositional properties can be determined by accessing the attic space where such exists:

- Evidence of wall and roof construction;
- Roof insulation thickness.

Particular attention must be paid to health and safety issues when accessing attic spaces and ceiling voids.

4.8 Missing or Non-Operational Building Services Equipment

NEAP assumes that the fixed installed building services equipment is operational and takes no account of whether it is working or not. However where a significant portion of a system is missing or damaged and therefore clearly not serviceable then, an appropriate default system is selected as described in Appendix 4.3 of this document.

For example in the case of a building served by a central heating system and the boiler is missing or removed, the assessment should be based on a default HVAC system (refer to Appendix 4.2 of this document) as there is no heat source in the building. Similarly, if there are no space heat emitters, the boiler cannot heat the building and therefore a default HVAC system should be assumed.
In the case of a missing or removed cylinder, where the cylinder is required to provide hot water, effectively there is no facility to heat hot water and therefore a default HWS system is used (refer to Appendix 4.3 of this document).
In the case of controls that are not operational but are installed, for example lighting controls, it is assumed that they are operational and should be accounted for. Guidance should be sought from the helpdesk if a BER Assessor is uncertain whether to include or to omit an incomplete system.

4.9 Data Protection Note on Collecting Supporting Evidence

Supporting evidence, **referred to in Section 8 of the Code of Practice**, is collected for the purpose of completing an accurate BER assessment[1]. This supporting evidence has the potential to contain personal data, which may be used to identify an individual. When collecting supporting evidence, BER Assessors should endeavour to avoid the collection of any un-necessary personal data or sensitive information.

"Personal data" means information that identifies or can identify an individual, directly or indirectly, by reference to an identifier. Sensitive personal information can include: any symbols or items that can identify the racial or ethnic origin, political opinions, religious or philosophical beliefs (eg. religious symbols on the wall), any items that can identify a person's health or sexual orientation, and/or any other items (e.g. personal or family photographs, certificates) that may identify an individual.

Guidance Note on Collecting Photographic Evidence

Photographic evidence has the potential to contain personal data. Assessors must take care that no sensitive information is captured within the photographic evidence of an assessment, that may then be used to identify an individual.

Before taking internal or external photographic evidence, BER Assessors should determine if there is any personal data within the frame, including sensitive personal data.

Guidance Note on Redacting Personal Information from Supporting Evidence

In cases where the supporting evidence collected contains personal data, this data must be removed. It is sufficient to 'black-out' any personal data on scanned documents. Alternatively, software tools are readily available for editing and redacting personal data from electronic versions of supporting evidence.

This does not include information that relates directly to the dwelling e.g. the property address, MPRN and Eircode, which is information SEAI requires to record the BER assessment.

[1] This data protection note on collecting supporting evidence is relevant to BER assessments, where personal data may be collected and used to identify an individual

Note on the Storage and Use of Supporting Evidence

BER Assessors are responsible for ensuring that supporting evidence is collected, stored and used in a safe and secure manner, and is only used for the purposes for which it was collected i.e. for the completion of BER assessment. BER Assessors should ensure that they maintain a secure document management system in line with data protection rules.

5 BER Assessor Using Assistance to Gather Information

BER Assessors are required to abide by all the terms and conditions outlined in the Code of Practice for BER Assessors. This includes the condition that a BER Assessor must take full responsibility for each BER assessment that he or she carries out. For a New Build Final, Existing or Shell and Core building, the BER Assessor is required to visit premises being assessed, the BER Assessor is responsible for:

- the collation of the data required for the assessment;
- ensuring that, within reason, the data compiled is an accurate representation of all characteristics relevant to the energy performance of the building;
- verification of data in any subsequent auditing, monitoring and compliance processes commenced by SEAI.
- Any assistance must be supervised by the BER Assessor

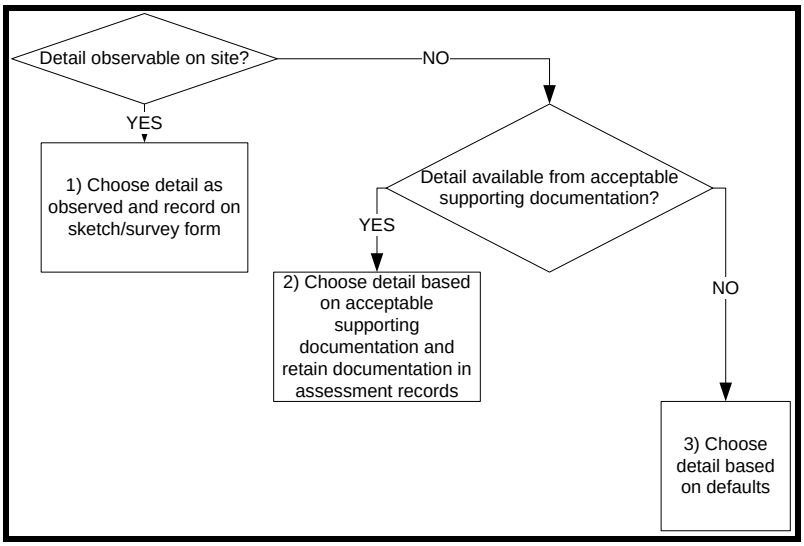
Refer to the SEAI BER Quality Assurance and Disciplinary Procedure and the BER assessors Code of Practice for further guidance.

6 Guidance on Supporting Evidence

As a general rule the default values in NEAP are conservative and must be used unless non-default values can be supported through acceptable documentary evidence or evidence recorded on site. Assessors are expected to make reasonable efforts to confirm that any default values used are selected correctly and only when non-defaults are unavailable.

The following diagram illustrates the order of priority for each data item in a BER assessment.

a) The actual data observed on site takes precedence.
b) Where the data item is not observable, it should be detailed using documentary evidence. Documentary evidence must be retained with the assessment records.
c) Where the data item is not observable on site or via documentary evidence, then a default is used.



This order of priority must be considered for all parameters entered in the NEAP software. For example, the Assessor is expected to take details of the boilers, check their efficiency as outlined in Section 7 of this

document and to use this value if it differs from the default value. As part of an SEAI audit, the Assessor is expected to show that reasonable efforts were made to ascertain non-default values rather than opting for default values. In all cases, supporting evidence must be obtained and retained by the Assessor for all non-default values used.

Non default values can be supported by a range of documentation as outlined in Section 7. Examples of documentary evidence include "As Built" drawings, Reports of work, Photographs, Copies of invoices/ receipts etc. Drawings marked "For Construction" may be used as "As Built" drawings if the drawings are signed off by the Assigned Certifier as equivalent to "As Built" drawings.

The copy of invoices/ receipts must have a detailed description of the work concerned and must clearly identify the work with the building concerned.

Evidence of works carried out in the building from a suitably qualified engineer or architect who is responsible for the works are acceptable as supporting documentary evidence. A suitably qualified person is defined as a FETAC level 7 qualification or higher in one of the following building construction related disciplines:

- Assigned Certifier
- Architecture
- Architectural Technology
- Building Services Engineering
- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- Quantity Surveying

Such evidence needs to provide sufficient detail for the NEAP entry in question.

For example, for retrofitted insulation, the invoice/receipt or report should detail the property address, material type, thickness and thermal conductivity, density of fill, etc. Thermal conductivity values for common building materials in new and existing buildings can be obtained from Building Regulation TGD L – Buildings Other Than Dwellings (Table A1) or from CIBSE Guide A. For existing and new-provisional buildings, I.S. EN 10456: 2007 or CIBSE Guide A may be used to determine the thermal conductivities for insulation products; however the preferred option is that thermal conductivity values are obtained for specific insulation products and the data should be obtained from accredited test data (for example an Agrément Certificate from the NSAI) in compliance with the relevant standards in TGD L. For new-final BERs, thermal conductivity values for insulation products must be obtained from accredited test data to the relevant standards in TGD L.

General Guidance on the Calculation of U-values to the relevant standards is contained in Report BR 443 "Conventions for U-value Calculations" 2006. For building elements and components generally, the method of calculating U-values is specified in I.S. EN ISO 6946: 1997. U-values of components involving heat transfer to the ground, e.g. ground floors with or without floor voids, basement walls, are calculated by the method specified in ISO 13370:2017. Software packages to perform U-value calculations for different building elements in accordance with the relevant standards above are readily available. Details, such as element thicknesses, thermal conductivities and resistances, used in carrying out U-value calculations must be retained in the BER assessment records by the BER Assessor.

Where there is adequate documentary evidence to support a non-default U-value, a non-default κ_m value must also be used based on the makeup of the construction. The κ_m value is calculated in compliance with CEN standard: EN 13790 using the method in 3.3.1 of How to use iSBEMie (Volume 2) . The κ_m value is the effective

thermal capacity of an element and accounts for the time it takes for heat to flow in or out of the building fabric. Refer to Appendix A4.9 of this document for details on calculation of κ_m values, software packages are available to calculate κ_m values.

6.1 Non-Default Efficiency Data

The following outlines acceptable sources of non-default efficiency data:

- Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard.
- Self-declaration literature from manufacturers in compliance with the Ecodesign directive. Literature must contain reference to the relevant Ecodesign directive, efficiency and test performance standard.
- Accredited Test certificates clearly relating to the product in question or as verified by the manufacturer/ supplier as having the same performance as the installed product, must comply with the following:
    - Installation instructions in the test certificate on which the stated performance depends must be adhered to;
    - Test certificates must be in English or be accompanied by a certified English translation. The translation can be from the accredited test house or from a professional translator listed by the Irish Translators and Interpreters Association or international equivalent;
    - The relevant test performance standard must be stated on the test certificate;
    - The test laboratory must be accredited. This may be demonstrated as follows:
        - The governing accreditation body for the test laboratory can be found under http://www.european-accreditation.org/ . This governing body may list the test laboratory as accredited;
        - The accredited laboratory may be found under http://ec.europa.eu/enterprise/newapproach/nando/ .

Table: Reference to relevant EU/ Ecodesign Directives and Testing Standards for Performance Data.

	EU/ Ecodesign Directives	Standard
Heat Recovery Seasonal Efficiency	EU 1253/2014	EN 13141-7 and EN ISO 5801 EN 13141-8 and EN ISO 5801
Heating Generator Seasonal Efficiency Refer to Appendix 5 for adjustment of efficiency for entry in NEAP.	EU 813/2013 – space heaters and combination heaters EU 2015/1189 – solid fuel boilers EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units	**Gas Boilers:** EN 15502-1:2012 Gas-fired heating boilers **Oil Boilers:** For condensing boilers: EN 15034:2006. Heating boilers - Condensing heating boilers for fuel oil; For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers **Heat Pumps – Space Heating:** EN 14825:2013 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load

		conditions and calculation of seasonal performance; EN 14511 – For Double Duct/ Single Duct air conditioners **Biomass Boilers:** EN303: 2013 Heating Boilers for solid fuels, manually or automatically stoked, nominal heat output of up to 500kW
Cooling Generator Seasonal Efficiency Refer to Appendix 5 for adjustment of efficiency for entry in NEAP.	EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units	EN 14825:2013 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance; EN 14511 – For Double Duct/ Single Duct air conditioners
Duct leakage		IS EN 1507:2006, IS EN 12237:2003 and IS EN 13403:2003
AHU leakage		IS EN 1886:2007
Specific Fan Power		IS EN 13779:2007
HWS Generator Seasonal Efficiency Refer to Appendix 5 for adjustment of efficiency for entry in NEAP.	EU 813/2013 and EU 814/2013 – water heaters and combination heaters EU 2015/1189 – solid fuel boilers EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units	**Gas Boilers:** EN 15502-1:2012 Gas-fired heating boilers **Oil Boilers:** For condensing boilers: EN 15034:2006. Heating boilers - Condensing heating boilers for fuel oil; For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers **Heat Pumps – DHW** EN 16147 **Biomass Boilers:** EN303: 2013 Heating Boilers for solid fuels, manually or automatically stoked, nominal heat output of up to 500kW
HWS Cylinder	EU 813/2013 and EU 814/2013 – Water heaters and combination heaters	EN 12897: 2006 EN 12977-3: 2012
HWS Secondary Circulation Losses		EN ISO 12241:2008

Refer to Appendix 9.		
Solar Thermal Collectors		IS EN 12975: 2006 IS EN 12976: 2006 IS EN 12977: 2006
Photovoltaics		IS EN 61215 IS EN 61646
CHP	CHP Directive EU 813/2013 and EU 814/2013 – water heaters and combination heaters	IS EN 15316-4-4

6.2 Alternate Software Packages

Where assessors are using alternative approved software packages, care must be taken to ensure that where default values are not pre populated by the software that the assessor manually populates them to match the defaults from iSBEMie.

7 Information Regarding Individual iSBEMie Inputs

The following tables supplement the software application manual (i.e. iSBEMie User Guides) when gathering data for buildings and in confirming compliance with Section 15 (Monitoring and Compliance) of the BER Assessors Code of Practice.

Where documentation is used to substantiate non-default values, it must describe the nature of the work in detail and leave no doubt that it is related to the building and systems being assessed.

The list of supporting evidence detailed in this section is for guidance purposes and may be amended over time. If in doubt whether or not the evidence recorded meets requirements in terms of evidence, the Assessor should contact the BER helpdesk. Other methods/supporting data may be considered by SEAI on a case by case basis, as they arise.

7.1 iSBEMie Software Tab: "General"

Data Entry Item	Guidance	Documentary Evidence
Stage of analysis	The Assessor choses from: New Building – Provisional New Building – Final Rating Existing Building – Final Rating Refer to Section 1 of this document for guidance on correct selection.	Evidence of construction date and occupancy: Architectural drawings; Correspondence from client Photographs
Project Complexity	Complexity of the building for the purposes of the Building Energy Rating. Refer to Section 3.2.2 of How to use iSBEMie (Volume 2).	External/Internal photographs of the Building to indicate the complexity of the building.
Building Type	This is generally obvious; office block, school, factory, warehouse, etc. This relates to the current building use which may have changed since the building was built, e.g. school house converted to restaurant. The Building Type sets the activities that may be assigned to the zones. Refer to Appendix A of How to use iSBEMie (Volume 1) for a list of activities associated with the building types. However, alternative activities for other building types remain available at zone level. The Building Type defines the majority of the building and is displayed on the BER certificate.	Internal photographs showing the building type; Architectural drawings; Correspondence from client detailing the building type.

Age of building	This is a key item of information because it forms the basis for selecting default values which in turn have a significant impact on the rating obtained. Similar methods must be applied when determining the age of any extensions/major refurbishments within the building. Refer to Appendix 4 of this document for the relationship between the age of construction and relevant building regulations. The "Year of Construction" is that of the original completion date of the oldest part of the building. Further information on the date of renovations and extensions can be provided in the "Location Description".	A copy of building legal documents such as the contract to build, final build contract payment certificate, completion cert, etc. are the preferred evidence of age. In the absence of such documentation, then a combination of the following indicators, supported by documentary evidence may be used (a minimum of two indicators are required) : • Stylistic evidence; • Planning permission documents; • Building or development age plates; • Electricity meter age; • Glazing age printed within double or triple glazing; • Building owner's knowledge (in writing).
MPRN	The MPRN can be found on the electricity bill for the building. In the absence of electricity bills, the MPRN may be printed in the electricity meter box or this information can be sourced from the ESB. The MPRN extranet on the Non-Domestic National Administration System (NDNAS) should be used to confirm that the MPRN is correct. Should an MPRN be unavailable, in the case where a building has no electricity supply, a SEAI property reference number (Dummy MPRN) will be required. A Dummy MPRN can be obtained by completing a RO11 Form which is available by contacting the SEAI Helpdesk. It is possible to enter more than one MPRN for a building where multiple MPRNs exist. Additional MPRNs will be saved into the XML file generated for the BER. However, only the first MPRN in the entered list will appear on the draft Advisory Report generated by the software	Copy of utility bill for the building or as supplied by the utility provider. Photograph of the electricity meter box. If an RO11 form was used. Retain a copy of the correspondence.

Building Address	Address to identify the location of the building, should be taken from utility bills. **The software requires that an Eircode be entered to run the software.** Should an Eircode be unavailable, such as in the case of a Provisional Building, the following Eircode is be used: A65 F4E2	Copy of utility bill. The address should allow for unique identification of the property in so far as possible, and in such a way that prospective purchasers or renters (or their agents) can content themselves that the rating before them in fact relates to the property in question. Assessors should confirm the address with the client. Utility bills, Eircode Finder, An Post's address verification service and Geodirectory provide other means of verifying the building address.
Energy Assessor Details	The BER Assessor enters their details. Please note that an XML upload will be rejected where the "Assessor number" and the "Asses Comp. No." are missing or incorrect.	None
Client Details	This section is optional. There is no requirement to complete this section.	None

7.2 iSBEMie Software Tab: "Project Database"

Data Entry Item	Guidance	Documentary Evidence
Heat loss roof U-values and Thermal Capacity Value κ_m	Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction. Non-default values should be used where possible. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values. When using non-default U-values for a roof facade, supporting evidence must indicate that the relevant roof facade has achieved the non-default U-value. U-values and κ_m values should be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations. Where there is adequate documentary evidence to support a non-default U-value, a non-default κ_m value must also be used based on the makeup of the construction. Section 6 of this document outlines the relevant guidance. Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A. For accessible roof void areas, ensure insulation depth is established by taking the average of a number of measurements. Different U-values (e.g. Different depths or materials) must be treated as separate roofs.	The evidence required to use non-default building characteristics (eg, U-values/ κ_m values) are met by one of the following: • "As Built" drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation; • Design drawings for New Provisional BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation; • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned; • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. Documents should indicate address, date and insulation material and thickness used. Photographs/photocopies of documentation should be retained as supporting evidence.

Wall U-values and Thermal Capacity Value κ_m	Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction. Non-default values should be used where possible. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values. When using non-default U-values, supporting evidence must indicate that the entire wall has achieved the non-default U-value. U-values and κ_m values should be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations. Where there is adequate documentary evidence to support a non-default U-value, a non-default κm value must also be used based on the makeup of the construction. Refer to Appendix 4.10 of this document for an example calculation. Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A. The presence of additional insulation must be supported by appropriate documentary evidence.	The evidence required to use non-default building characteristics (eg, U-values/ κ_m values) are met by one of the following: • "As Built" drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the wall construction including the insulation material used and thickness of the insulation; • Design drawings for New Provisional BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation; • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned; • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. Documents should indicate address, date and insulation material and thickness used. Photographs / photocopies of documentation should be retained as supporting evidence.

Floor U-values and Thermal Capacity Value κ_m	Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction. Non-default values should be used where possible. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values. When using non-default U-values, supporting evidence must indicate that the entire floor has achieved the non-default U-value. U-values and κ_m values must be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations. Where there is adequate documentary evidence to support a non-default U-value, a non-default κ_m value must also be used based on the makeup of the construction. Appendix 4.10 of this document provides an example calculation. Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A. Appendix 4.10 of this document provides an example calculation.	The evidence required to use non-default building characteristics (eg U-values/ κ_m values) is met by one of the following: • "As Built" drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the floor construction including the insulation material used and thickness of the insulation; • Design drawings for New Provisional BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation; • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned; • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. Documents should indicate address, date and insulation material and thickness used. Photographs / photocopies of documentation should be retained as supporting evidence.

Door U-Value and Thermal Capacity Value κ_m	Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of door installed. Non-default values should be used where possible. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values. U-values and κm values must be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations. Where there is adequate documentary evidence to support a non-default U-value, a default κm value may be used if a non-default value based on the makeup of the construction is not available. The default κm value should be 6.75 kJ/m2K. Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A.	The evidence required to use non-default building characteristics (eg, U-values/ κ_m values) are met by one of the following: • "As Built" drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the Door make and model and copies of certified U-values; • Design drawings/ specification for New Provisional BERs detailing the Door make and model and copies of certified U values. • Copies of invoices with technical characteristics of the door, clearly identifying that it relates to the building concerned. Documents should indicate building address, date and details of the door in question. Photographs / photocopies of documentation should be retained as supporting evidence.

Window U-value, T-Solar and L-Solar	Default values to be used unless acceptable evidence to support non-default values for the U-value, T Solar and L Solar is available. Non-default values must be demonstrated for each of the entries for U-value, T-Solar and L-Solar. Otherwise, a default value should be used for all. Where default values are used, evidence is required to support age of construction and the type of window installed. Non-default values should be used where possible. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values. Non-default values for U-values, Solar and Light Transmittance values supplied by manufacturers or suppliers are calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. The manufacturer/ supplier must provide CE marked or Declaration of Performance for the product with reference to the relevant standards. Film or signage applied to the glass to advertise/ promote services or products is regarded as occupier behaviour and should be ignored for the purposes of the BER assessment.	The evidence required to use non-default building characteristics (eg, U-values) are met by one of the following: • "As Built" drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the window make and model and copies of certified U-values, solar and light values; • Design drawings/ specification for New Provisional BERs detailing the window make and model and copies of certified U-values, solar and light values; • Original installation documentation from the installer detailing window make and model can be used if available (to obtain certified data); • Representative photographs of the window, gap between glazing, manufacturer's stamp pointing to certified data can be used as supporting evidence. If measuring the gap between glazing panes, ensure that the thickness of the glazing panes is not included in the final glazing gap figure; • Copies of invoices with technical characteristics of the window and must clearly identify the window relates to the building concerned.

Curtain Walling	Default values to be used unless acceptable evidence to support non-default values for the U-value of the curtain wall system, T Solar and L Solar for the transparent element of the curtain wall system is available. Non-default values must be demonstrated for each of the entries for U-value, T-Solar and L-Solar. Non-default values for U-values, Solar and Light Transmittance values supplied by manufacturers or suppliers are calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. The manufacturer/ supplier must provide CE marked or Declaration of Performance for the transparent elements with reference to the relevant standards. A site-specific thermal transmittance calculation should be undertaken by a competent person e.g. façade engineer and calculated in accordance with I.S. EN 12631:2012 taking on board the specific geometry of the installed product/ system. Thermal Bridging factors that are accounted for in the curtain walling system should be set to zero in the applicable zones in iSBEMie. These would typically be lintel, sills, and jambs and potentially wall - wall and wall – floor junctions. For opaque sections of curtain walling or spandrel panels the solar and light transmittance values are set to zero.	The evidence required to use non-default building characteristics (eg, U-values) are met by one of the following: • "As Built" drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the curtain walling make and model and copies of certified U-values, solar and light values; • Design drawings/ specification for New Provisional BERs detailing the curtain walling make and model and copies of certified U-values, solar and light values; • Original installation documentation from the installer detailing window make and model can be used if available (to obtain certified data); • Representative photographs of the window, gap between glazing, manufacturer's stamp pointing to certified data can be used as supporting evidence. If measuring the gap between glazing panes, ensure that the thickness of the glazing panes is not included in the final glazing gap figure; Copies of invoices with technical characteristics of the window and must clearly identify the window relates to the building concerned.

7.3 iSBEMie Software Tab: "Geometry > Project"

Data Entry Item	Guidance	Documentary Evidence
Building Infiltration	For publication of a BER, use the air permeability default value of 25 $m^3/h/m^2$ at 50 Pa unless a valid acceptable pressure test certificate is available. For large complex buildings with an envelope area in excess of 160,000m2 such as airport terminals, regional hospitals or large shopping centres where it is not practical to implement a	Where a non-default value is used, a copy of the pressure test certificate must be provided with the following details: - address of the building - date of the pressure test. - Permeability (air leakage rate in m^3/hr divided by envelope area m^2 at 50 Pascal pressure difference)

	phased pressure testing approach, the alternative approach outlined in Section 5.3 of ATTMA document Technical Standard L2 Measuring Air Permeability of Building Envelopes (Non-Dwellings) may be adopted. Where this has been demonstrated a default of 5 $m^3/h/m^2$ at 50 Pa may be used. The procedure for testing is specified in I.S. EN ISO 9972: 2015 "Thermal performance of buildings: determination of air permeability of buildings: fan pressurization method". Detailed guidance on testing procedure is given in ATTMA TSL2 publication "Measuring air permeability of Building Envelopes" and additional guidance is provided in CIBSE Technical Manual TM 23 "Testing Buildings for Air leakage".	Pressure test certificates must be in compliance with I.S. EN ISO 9972: 2015 "Thermal performance of buildings: determination of air permeability of buildings: fan pressurization method" and CIBSE Technical Manual TM23 "Testing Buildings for Air Leakage". Individuals/ organisations carrying out pressure tests must also demonstrate that they are competent to carry out the testing. Individuals may, for example, demonstrate competence to carry out permeability tests on buildings by being registered under the NSAI's Air Tightness Testers Scheme. Additionally, individuals and organisations may demonstrate competence by being accredited to carry out tests to I.S. EN ISO 9972: 2015 by the Irish National Accreditation Board (INAB) or any other bodies capable of providing accreditation to ISO /IEC 17025: "General Requirements for the Competence of Testing and Calibration Laboratories" For Provisional BER certificates the assessor must have evidence of one of the following: - that the Developer/ Builder has history of achieving proposed air leakage for similar type/ size buildings. - has appointed Air Tightness consultant for design and construction observation. The air tightness consultant must have previous experience of delivering similar air tightness levels. The air tightness consultant may be a member of the design team.
Building orientation	The default is set at zero, and should only be changed with caution. Refer to Section 3.4.2 of How to use iSBEMie (Volume 2).	Copy of site plan of building with orientation or a photograph of compass in relation to the building.
Zone Height (Global)	Enter the floor to floor or floor to soffit for top	Building sketches with dimensions,

	floor. Refer to Appendix 6 of this document. This will then be the default zone height applied to all zones and can be edited at zone level	calculations and Survey Form or Architectural drawings with dimensions, calculations and Survey Form. Building sketches/ architectural drawings should show the depth of all components, including floor slabs, floor voids, ceiling voids etc.
Maximum number of storeys	Enter the maximum number of storeys in the building	Building sketches with dimensions, calculations and Survey Form or Architectural drawings with dimensions, calculations and Survey Form.
Building area	Enter the total floor area of building. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) and Section 3.4.3 of How to use iSBEMie (Volume 2).	Floor by floor sketches with dimensions and calculations or Architectural drawings with dimensions and calculations marked up to show zones.
Global Thermal bridges	For existing buildings, it is unlikely that sufficient evidence will be obtainable to substantiate the use of non-default thermal bridging values. Where insufficient evidence is available the input fields must be left blank, resulting in default figures being used. As outlined in Section 3.4.2 of How to use iSBEMie (Volume 2), the values visible are further degraded in the calculation process. The values used in the calculation can be accessed from the data reflection report. Refer to Section 4.2.3 of How to use iSBEMie (Volume 2) for details on how to access the report. Non-default thermal bridging values should be used where possible for new buildings. The Assessor is expected to show that reasonable efforts were made to ascertain actual values rather than opting for default values.	Where a non-default value is used, acceptable documentary evidence must be provided for the building. Where accredited data is available one of the following must be provided: - For psi values from "Limiting Thermal Bridging and Air Infiltration - Acceptable Construction Details" (http://www.environ.ie) as referenced in Appendix D of the Building Regulations TGD L, documentary evidence must be provided that demonstrates that the details have been conformed to. This requires that: 1) the relevant drawings clearly show the relevant details and that these details are checked and signed off by the developer/builder, site engineer or architect. 2) As built Plans/ Sections/ Elevation drawings showing

		all key junction locations and reference to detailed drawing for New Final, New Provisional – Shell and Core and Existing BERs. 3) Design Plans/ Sections/ Elevation drawings showing all key junction locations and reference to detailed drawing for New Provisional BERs. - Certified psi values are used, documentary evidence in accordance with the methods described in IS EN ISO 10211:2017 and BR 497: 2016 must be provided. These calculations of two dimensional or three-dimensional heat flow require the use of numerical modeling software. To be acceptable, numerical modeling software should model the validation examples in IS EN ISO 10211:2017 with results that agree with the stated values of temperature and heat flow within the tolerance indicated in the standard for these examples. Detailed guidance on decisions regarding specific input to the modeling software and the determination of certain quantities from the output of the software is contained in BRE Report BR 497 Conventions for calculating linear thermal transmittance and temperature factors. This guidance should be followed in carrying out modeling work so that different users of the same software package and users of different software packages can obtain correct and consistent results. Certification of the detail by a member of the NSAI Thermal Modellers' Certification Scheme, certified by a third body such as Agrement or equivalent or from accredited database such as the BRE Certified

		Thermal Details and Products Scheme is a means of meeting the requirements in TGD L and NEAP for calculation of Ψ values.

7.4 iSBEMie Software Tab: "Geometry > Zones > General"

Data Entry Item	Guidance	Documentary Evidence
HVAC System	The use of default HVAC systems is detailed in Appendix 4.3 and Appendix 7 of this document. The appendices deal specifically with the following circumstances: - Shell and Core Buildings - No HVAC present in the building/ zone For further detail on default HVAC systems refer to Section 3.4.3 of How to use iSBEMie (Volume 2). The BER is based on non-default HVAC systems where there is sufficient evidence available. As outlined in Section 6 of this document the Assessor is expected to show that reasonable efforts were made to ascertain non-default values rather than opting for default values.	The evidence required in order to use non-default building characteristics is met by one of the following in conjunction with the plantroom survey and ceiling void details: • Copy of as built HVAC drawings and specifications for New Final and Existing BERs; • Copy of design HVAC drawings and specifications for New Provisional BERs; • Copy of technical details from operational and maintenance manuals; • Representative photographs of the HVAC system.
Building Type/ Activity	The activity specified sets default parameters which the tool uses to calculate the energy consumption. These parameters include temperature set points, heat gains from people and equipment, required illuminance, and fresh air requirements amongst others. For details Refer to Section 3.4.3 of How to use iSBEMie (Volume 2).	In combination with the floor by floor sketches /architectural drawings marked up to show zones the following should be provided: • Survey Form; • Note on basis used to define zones.
Area	Floor area of zone. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) and Section 3.4.3 of How to use iSBEMie (Volume 2).	Floor by floor sketches with dimensions and calculations or Architectural drawings with dimensions and calculations marked up to show zones.
Height	Height of zone Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) and Section 3.4.3 of How to use iSBEMie (Volume 2).	Building sketches with dimensions, calculations and Survey Form or Architectural drawings with dimensions, calculations and Survey

	Refer to Appendix 6 of this document for examples of zone height calculation.	Form. Building sketches/ architectural drawings should show the depth of all components, including floor slabs, floor voids, ceiling voids etc.
Zone Infiltration	Guidance as per "Building Infiltration"	Documentary Evidence as per "Building Infiltration"
Thermal Bridges	Guidance as per "Global Thermal Bridges" Thermal Bridging factors that are accounted for in the curtain walling system should be set to zero in the applicable zones in iSBEMie.	Documentary Evidence as per "Global Thermal Bridges"

7.5 iSBEMie Software Tab: "Geometry > Envelope"

Data Entry Item	Guidance	Documentary Evidence
Name	Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1). for guidance.	Not applicable.
Zone	Zone that envelope element is part of.	Floor by floor sketches with dimensions and Survey Form or Architectural drawings with dimensions and marked up to show zones and Survey Form.
Type of Envelope	Choose between wall, floor/ceiling and roof.	Not applicable.
Construction	Choose from Constructions set up in Project Database for envelope type.	Floor by floor sketches with dimensions and Survey Form and photographs or Architectural drawings with dimensions and marked up to show zones and Survey Form and photographs.
Connects Space to	Choose what conditions apply to the other side of the wall, floor/ceiling or roof. Refer to Section 3.4.4 of How to use iSBEMie (Volume 2) for definitions. Refer to Appendix 8 of this document for further guidance.	Floor by floor sketches with dimensions and Survey Form or Architectural drawings with dimensions and marked up to show zones and Survey Form.
Orientation	This Specifies the orientation of the envelope element. Select from one of the available options.	Copy of site plan or sketch of building with orientation and photograph of compass in relation to the building.
Area	Area of envelope inclusive of any windows/ doors. Refer to Section 3.4 Measurement and Other	Floor by floor sketches with dimensions, calculations and Survey Form or Architectural drawings with

	Conventions in How to use iSBEMie (Volume 1) for guidance.	dimensions, calculations and marked up to show zones and Survey Form.
Perimeter	Enter the horizontal dimension of the wall, as per Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) This field becomes active for wall elements only. The default value is based on area of the element divided by the entered zone height. For some wall elements e.g. a gable end wall this calculated value will not be correct and will need to be overridden manually.	Floor by floor sketches with dimensions, calculations and Survey Form or Architectural drawings with dimensions, calculations and marked up to show zones and Survey Form.
Pitch	Enter pitch angle, in degrees from the horizontal. This field becomes active for "roof" or "floor or ceiling" elements only. The default value for roof is 45° and for floor or ceiling is 0°.	Floor by floor sketches with dimensions, calculations and Survey Form or Architectural drawings with dimensions, calculations and marked up to show zones and Survey Form.
Tick if there is a solar collector on this wall	Tick if there is a solar collector present. This field becomes active for "wall" elements only and where a Solar Collector has been defined.	Guidance as per "Solar Collectors"
Additional Thermal Bridges	Enter **additional** thermal bridges to those already described in the Thermal Bridges Project or Zone tab. Guidance as per "Global Thermal Bridges"	Documentary Evidence as per "Global Thermal Bridges"

7.6 iSBEMie Software Tab: "Geometry > Doors"

Data Entry Item	Guidance	Documentary Evidence
Name	Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1) for guidance.	Not applicable.
In Envelope	Enter the Envelope that Door is part of. Note: Doors located in internal walls are not entered. The entire wall area is entered as if there were no door. Note: Doors with more than 50% glazed should be entered as a window. Refer to Section 3.3 in How to use iSBEMie (Volume 2).	Floor by floor sketches with dimensions and Survey Form or Architectural drawings with dimensions and marked up to show zones and Survey Form.
Type	Choose between High Usage Entrance,	Not applicable.

	Personnel, and Vehicle Access Doors.	
Construction	Choose from Constructions set up in Project Database for door type.	Floor by floor sketches with doors identified and Survey Form and photographs or Architectural drawings with doors identified and marked up to show zones and Survey Form and photographs.
Area	Enter the Area of structural opening in wall including frame. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1).	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form.

7.7 iSBEMie Software Tab: "Geometry > Windows and Rooflights"

Data Entry Item	Guidance	Documentary Evidence
Name	Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1) for guidance.	Not applicable.
In Envelope	Enter the Envelope that window/rooflight is part of.	Floor by floor sketches with dimensions and Survey Form or Architectural drawings with dimensions and marked up to show zones and Survey Form.
Glazing Type	Choose between the glazing types defined in Project Database or default glazing.	Floor by floor sketches with glazing type identified and Survey Form and photographs or Architectural drawings with glazing type identified and marked up to show zones and Survey Form and photographs.
Area	Enter the Area of structural opening in wall/roof including frame. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) for measurement conventions.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form.
Surface Area Ratio	Enter the ratio of the "developed area to projected area" for the window or rooflight as defined in Section 3.4.5 of How to use iSBEMie (Volume 2). The developed area is the total area of the glass plus frame. The projected area is the area of the opening in the envelope.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form.

Display Window Tickbox	Tick if the window is a "Display Window". This is a window intended for the display of products or services on offer within the building, positioned: • At external perimeter of the building; and • At an access level and immediately adjacent to a pedestrian thoroughfare. Glazing more than 4m above such an access level or incorporates a fixed or opening light of less than 2m², should not be considered part of the display window except: • Where the size of individual products on display require a greater height of glazing; • where changes to the façade requiring planning (including glazing) require a greater height of glazing, e.g. to fit in with surrounding buildings or to match the character of the existing façade.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form.
Area Ratio Covered	Enter the ratio of the roof area covered by an array of rooflights to the total area of the rooflight glazing. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form.
Frame Factor	Enter the ratio of the window or rooflight area which is occupied by the frame to the total window or rooflight area. The default value is 0.1 for a window (i.e., 10% of the total area is occupied by the frame and 90% by the glazing) and 0.3 for a rooflight. Note: This will impact on solar gain. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form or Window manufacturers technical data sheets and declarations for installed window system in specific building
Aspect Ratio	Enter the ratio of a windows height to the windows width. (i.e. window height / window width) Note: This will impact on the thermal bridging calculations for the Lintel, Sill and Jamb lengths. The default value is 0.7. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.	Building sketches with dimensions and Survey Form or Architectural drawings with dimensions and Survey Form or Window manufacturers technical data sheets and declarations for installed window system in specific building
Shading position	Choose from None (no shading), Internal or External based on the presence of movable	Building sketches or Survey Form and photographs

	solar shading device. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.	or Architectural drawings and Survey Form and photographs.
Shading colour	Choose the colour of the movable solar shading device from Black, Dark, Pastel or White. Refer to Section 3.4.5 of How to use iSBEMie Compliance Assessment for definition.	Building sketches or Survey Form and photographs or Architectural drawings and Survey Form and photographs. or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building
Shading translucency	Choose the translucency of the movable solar shading device from High translucent, Medium translucent or Opaque. Opaque = 0% transmittance Medium Translucent = 20% transmittance High Translucent = 40% transmittance Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.	Building sketches or Survey Form and photographs or Architectural drawings and Survey Form and photographs. or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building
Transmission Factor	This is the fraction of light transmitted through that specific window after accounting for shading from overhangs and fins. For details on how to calculate the transmission factor, see Section 3.4.6: Transmission Correction Factors of How to use iSBEMie (Volume 2).	Building sketches with dimensions and Survey Form and photographs or Architectural drawings with dimensions and Survey Form and photographs.
Brise-Soleil Tickbox	Tick this box if the overhang whose transmission factor is accounted for in the previous parameter is in fact a brise-soleil. Brise-Soleil for iSBEMie can be strips, louvres, holes etc as opposed to solid overhang. Refer to Section 3.4.5 of How to use How to use iSBEMie (Volume 2) for definition.	Building sketches with dimensions and Survey Form and photographs or Architectural drawings with dimensions and Survey Form and photographs or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building

7.8 iSBEMie Software Tab: "Building Services > Global and Defaults > HVAC System Defaults"

Data Entry Item	Guidance	Documentary Evidence
HVAC System Defaults	Refer to Appendix A4.2 of this document for details on default HVAC system entry.	The basis for selecting a default system must be documented and retained

	Default systems are only used where actual systems do not exist or are too incomplete. (See Section 4.8 of this document for guidance on non-operational and missing equipment.) Where actual systems exist, they are defined as per **iSBEMie Software Tab: "Building Services > HVAC Systems > General"** as described later in this document. This sub-tab is not available for a Part L only assessment.	together with supporting information. Building sketches with dimensions and Survey Form and photographs Photographs of areas where default systems are to be allocated As Built drawings and specifications for New Final and Existing BERs. Design drawings and specifications for Existing BERs.

7.9 iSBEMie Software Tab: "Building Services > Global and Defaults > Project Building Services"

Data Entry Item	Guidance	Documentary Evidence
Is the lighting separately metered?	Answering "yes" to this input would require the Assessor to obtain formal confirmation that the lighting is separately metered.	The evidence required in order to answer "Yes" is met by one of the following • Copy of As Built electrical schematics showing meters for New Final and Existing BERs; • Copy of Design electrical schematics showing meters for New Provisional BERs • Photograph of sub-meter permanently labelled showing it is for lighting • Letter from an electrical contractor advising that they have checked the system in the last 12 months and confirming that it is separately metered.
M&T with alarm for "out of range" values?	The Assessor must ascertain if such a system is installed, M&T system must have alarm for "Out of Range" values.	For New Final or Existing BERs, the evidence required is details of M&T system from operational and maintenance manuals. Review the BMS to ensure that the system is in operation or review records for previous 12 months. For New Provisional BERs specification of the BMS/ BEMS should be provided demonstrating

		function.
Electricity Power Factor	The default power factor value of <0.9 must be used in an existing building unless analysis of the recent 12 month's bill data indicates a different value. The default power factor value of <0.9 must be used in a new building unless one of the following is demonstrated: ***1)*** A power factor of >0.95 can be used in a new building where there is adequate documentary evidence to support the installation of power factor correction equipment within the building for final certificates and the proposed installation of power factor correction equipment for provisional certificates. ***2)*** A non-default power factor can be used for a Final BER in a new building where a suitably qualified electrical engineer has produced a report detailing the expected power factor for the building as constructed. ***3)*** A non-default power factor can be used for a Provisional BER in a new building where a suitably qualified electrical engineer has produced a report detailing the expected power factor for the building as per the design.	Electricity utility bills for 12-month period prior to assessment of an existing building. For a new building, detail of installed power factor correction equipment or a signed report from a suitably qualified electrical engineer.
Has LENI calculation been carried out?	Answering "yes" to this input confirms that a Lighting Numerical Indicator (LENI) method has been carried out for the building as an alternative to complying with the lighting efficacy standards specified in Part L. This will be reported in the BRIRL output document. Note: The lighting energy calculation in iSBEMie is not affected by this data entry item.	The evidence required in order to answer "Yes" is met by a signed statement from a suitably qualified engineer from the consultants responsible for the lighting design showing: • LENI Calculations in compliance with Appendix F of Part L of the Building Regulations. • As Built Specification and Drawings for New Final BER • Design Specification and Drawings for New Provisional BER .
Process Energy for RER: Primary Energy Exported	This field allows entry of a figure for total process primary energy exported annually contributing to the Renewable Energy Ratio for Part L compliance. Note: It does not impact on the energy and carbon performance compliance requirements or the Building	For new buildings, a report from a suitably qualified member of the design team, detailing how the renewable primary energy exported has been calculated.

	Energy Rating. The process energy should not be accounted for in the regulated loads included in the NEAP methodology.	The report should be submitted for review to SEAI/ DHPLG prior to inclusion in the NEAP methodology.
Process Energy for RER: Primary Energy used	This field allows entry of a figure for total process primary energy exported annually contributing to the Renewable Energy Ratio for Part L compliance. Note: It does not impact on the energy and carbon performance compliance requirements or the Building Energy Rating. The process energy should not be accounted for in the regulated loads included in the NEAP methodology.	For new buildings, a report from a suitably qualified member of the design team, detailing how the renewable primary energy used has been calculated. The report should be submitted for review to SEAI/ DHPLG prior to inclusion in the NEAP methodology.
District Heating Parameters	District Heating is defined as a central system serving multiple buildings from a system outside the boundaries of the site. The default value must be used if District Heating is selected as the heat source and there is no documentary evidence to substantiate non-default entries. A non-default value is used where possible. The Assessor should ascertain the CO_2 emission factor and primary energy factor for district heating which should reflect the average annual efficiency and fuel mix of the whole district heating system. It should include for all the gross efficiencies of heat generating plants, including any CHP generators, any waste heat recovery or heat dumping, the effect of heat losses in distribution (external to the building), the emissions from electricity used for pumping, and any other relevant carbon dioxide emissions.	For existing buildings, a report from the district heating scheme operator, detailing how the CO_2 emission and primary energy factors for the district heating have been derived. For new buildings, a report from a suitably qualified member of the design team, detailing how the CO_2 emission and primary energy factors for the district heating have been derived. The calculations should be based on actual fuel bills over a 1-year period. Where a renewable primary energy conversion factor is proposed, the report should be submitted to SEAI/ DHPLG prior to inclusion in the NEAP methodology. The CO_2 emission factors and primary energy factors for the fuel(s) used by the district heating system should be taken from Appendix 12 of this document.

7.10 iSBEMie Software Tab: "Building Services > HVAC Systems > General"

Data Entry Item	Guidance	Documentary Evidence
Type	Select from the Building Services Type options in Database for Building Services. Follow guidance in Section 3.5.2 of How to use iSBEMie (Volume 2). Categorising the HVAC system is an important aspect of BER production because such systems account for the major proportion of energy used in a building. The Assessor must be familiar with the various types of HVAC systems as categorised in Table 7 of How to use iSBEMie (Volume 2). The Assessor must be capable of categorising the system based on the limited information available on site.	For New Final and Existing BERs, in conjunction with the plantroom survey details and ceiling void details the evidence required is met by one of the following: • Photographs of air handling units, ducting, associated equipment in ceiling voids, heater/cooling batteries, fresh air intakes, discharge grilles, actuated dampers, etc; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications. For New Provisional BERs, design drawings, specifications and technical data sheets must be provided. The basis for categorising a system must be documented and retained together with supporting information.
Heat Source	Select from the Heating Sources options in the database	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat source plant (eg boiler nameplates and manufacturer name); • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications. For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.
Fuel Type	Select from the Fuel Types	For New Final and Existing BERs, in conjunction with the plantroom survey

	For further guidance on the selection of solid fuel types refer to Appendix 10 of this document.	details, the evidence required is met by one of the following: • Photographs of heat source plant (eg boiler nameplates and manufacturer name); • Copies of technical data sheets from operational and maintenance manuals; • As built drawings and specifications. For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.
Tick if this system also uses CHP	The Assessor must ascertain if the heating system derives its heat, or part of it, from a combined heat and power system. When this is ticked in iSBEMie, a new tab opens, "CHP generator".	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of CHP plant with nameplates and manufacturer name; • Copies of technical data sheets from operational and maintenance manuals; • As built drawings and specifications. For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.
Cooling System Generator Type	Select from the Generator Types options in the database.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of cooling plant (eg chiller nameplates and manufacturer name); • Copies of technical data sheets from operational and maintenance manuals; • As built drawings and specifications. For New Provisional BERs, design

		drawings, specifications and technical data sheets must be provided.
Ventilation - Heat Recovery	The heat recovery system may be incorporated within the air handling unit(s) or it may be external. The Assessor must establish whether or not heat recovery is fitted	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat recovery unit; • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. For New Provisional BERs, design drawings and specifications.
Tick if variable heat recovery efficiency	Tick box if documentary evidence is available to show that the heat recovery system can be bypassed or switched off in summer.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of bypass/ controls; • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. For New Provisional BERs, design drawings and specifications.
Heat Recovery Seasonal Efficiency	The default value must be used for efficiency if there is no documentary evidence to substantiate non-default entries. A non-default value should be used where possible. Non-default efficiency values must be in compliance with the Commission Regulation (EU) 1253/2014 with regard to ecodesign requirements for ventilation units. Non-default efficiencies may be obtained from the following sources as per Section 6.1: • Performance data on "CE marked" literature is acceptable provided that the	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat recovery unit; • Copies of technical data sheets from operational and maintenance manuals • Sources of efficiency as outlined in "Guidance" and Section 6.1; • As Built drawings and specifications. For New Provisional BERs, design

	literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard	drawings, specifications and sources of efficiency as outlined in "Guidance" and Section 6.1.

7.11 iSBEMie Software Tab: "Building Services > HVAC Systems > Heating"

Data Entry Item	Guidance	Documentary Evidence
Does it qualify for ECA/ACA?	Check the equipment concerned at http://www.SEAI.ie/Your_Business/Accelerated_Capital_Allowance Or the UK equivalent https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH	Take note of the specific equipment make and model number and show corresponding details on ACA webpage (or ECA now called ETL, the UK equivalent). Include a snapshot of the relevant page from the website. A web link to the page is not acceptable since it may expire. ETL allows the user to receive an automated email with the product listing. ACA can generate an Excel file with the product listing. Both of these are acceptable as supporting evidence for this entry.
Do you know the effective heat generating seasonal efficiency?	It is important to note that there is a difference between the "as tested" efficiency of a boiler, the "gross seasonal" efficiency and the "Effective Heat Generating Seasonal Efficiency" as required in iSBEMie. Refer to Appendix 5 of this document for further guidance on the effective heat generating seasonal efficiency to be used. Non-default efficiencies may be obtained from the following sources as per Section 6.1 of this document: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat source plant (eg boiler nameplates and manufacturer name) and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;

	• Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard • ECA/ ACA websites, where technology has been tested to the relevant test performance standard. The Assessor should use default values only if it is not possible to obtain the heating source efficiency data required and should have evidence to substantiate this, such as correspondence from heating source manufacturer stating that efficiency is not available. Note: Boiler efficiency is entered as a decimal. A non-default user figure of e.g. 92% is entered as 0.92. If the figure is entered incorrectly as 92 the software will warn the user with a message in red adjacent to the entered figure **"Warning efficiency seems high. Are you sure?"** This must be corrected by the user before publication.	
Do you know the generator radiant efficiency?	This field is only active for radiant based heating systems. For radiant heaters the Heat Generator Seasonal Efficiency is equivalent to its thermal efficiency (gross calorific value basis). For flued appliances the thermal efficiency of the radiant heater will be stated by the manufacturer of the radiant heater having been measured according to the test standards EN 1020 or EN 13842 as applicable. The procedures in EN 1020 and EN 13842 yield a net efficiency - this must be converted to a gross efficiency.	The evidence required is met by one of the following: • Photographs of heat source plant (eg nameplates and manufacturer name) and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Do you know the ratio of fan power to heating output?	This field is only active for local fan assisted heating systems where "Central heating using water: convectors" or "Other local room heater – fanned" has been selected as the HVAC system. Enter the fan power of integral fans, in W per kW	The evidence required is met by one of the following: • Photographs of fan assisted heaters nameplates and manufacturer's data sheets; • Copies of technical data sheets

	heat output by the heating system.	from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Tick if this system also uses CHP	Refer to previous section **"Building Services > HVAC Systems > General"**	Refer to previous section **"Building Services > HVAC Systems > General"**

7.12 iSBEMie Software Tab: "Building Services > HVAC Systems > Cooling"

Data Entry Item	Guidance	Documentary Evidence
Generator kW	Select the cooling generator nominal electrical power.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of cooling plant (eg chiller nameplates and manufacturer name) and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Fuel Type	Select from the Fuel Types	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of cooling plant (eg chiller nameplates and manufacturer name) and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

Does it qualify for ACA or ECA?	Check the equipment concerned at http://www.SEAI.ie/Your_Business/Accelerated_Capital_Allowance Or the UK equivalent https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH .	Take note of the equipment and details on ACA/ECA webpage as outlined above.
Do you know the generator seasonal energy efficiency ratio (SEER)?	Refer to Appendix 5 of this document for further guidance on the effective heat generating seasonal efficiency to be used. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard. • ECA/ ACA websites, where technology has been tested to the relevant test performance standard. • Eurovent website, where technology has been tested to the relevant test performance standard. The Assessor should use default values only if it is not possible to obtain the cooling plant efficiency data required and should have evidence to substantiate this, such as correspondence from chiller manufacturer stating that efficiency is not available.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of cooling plant (eg chiller nameplates and manufacturer name) and manufacturer's data sheet; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Do you know the generator nominal energy efficiency ratio (EER)?	Please note that in this guide the term "Energy Efficiency Ratio (EER)" has the same meaning as the "Nominal Energy Efficiency Ratio (EER)" used in iSBEMie. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of cooling plant (eg chiller nameplates and manufacturer name) and manufacturer's data sheet; • Sources of efficiency as outlined in "Section 6.1 of this document;

	literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard. • ECA/ ACA websites, where technology has been tested to the relevant test performance standard. • Eurovent website, where technology has been tested to the relevant test performance standard. The Assessor should use default values only if it is not possible to obtain the cooling plant efficiency data required and should have evidence to substantiate this, such as correspondence from chiller manufacturer stating that efficiency is not available.	• Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Tick box to indicate if the HVAC system uses a mixed mode cooling operation	To tick the box the assessor must have documentary evidence to support: • Natural ventilation from operable windows is present • Mechanical cooling is present.	In conjunction with the survey details, the evidence required is met by one of the following: • Photographs of cooling plant and openable windows within the building. • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

7.13 iSBEMie Software Tab: "Building Services > HVAC Systems > System Adjustment"

Data Entry Item	Guidance	Documentary Evidence
Has the ductwork been leakage tested?	Non-default classification leakage may be obtained from the following sources: • Test data in compliance with B&ES DW/143 and B&ES DW/144 identifying the Class of leakage. • Specifications in compliance with EN standards such as IS EN 1507:2006, IS EN 12237:2003 and IS EN 13403:2003.	The evidence required is met by one of the following: • Copy of Test Certificates from test on site, test must be carried out to CEN standards for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

Does the AHU meet CEN leakage standards?	Non-default classification leakage may be obtained from the following sources: • Test data in compliance IS EN 1886:2007. • Specifications in compliance with EN standards such as IS EN 1886:2007	The evidence required is met by one of the following: • Copy of Test Certificates, test must be carried out to CEN standards for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Do you know the specific fan power (SFP)?	There is an onus on the Assessor to make reasonable efforts to find and use the fan details and to resort to the default value only if the information is not available. The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D Calculation and Appendix E of the TGD Part L 2017 – Buildings Other than Dwellings. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard.	The evidence required is met by one of the following: • Photographs of fan nameplates and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Calculations of SFP must be retained as evidence.
Presence and Type of Variable Speed Pump	The Assessor must examine the LTHW and CHW circulating pumps to determine if they are variable speed type. Manufacturer's data sheets should assist in this regard. Where Variable Speed Pumps are present, the assessor must determine the type of sensors present. In larger systems the sensor(s) may be remote from the pump(s). Drawings and operational & maintenance manuals will be needed to verify	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of pumps and manufacturer's data sheets; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional

	this sort of arrangement. If unknown, the default sensor is "With differential sensor across pump".	BERs;

7.14 iSBEMie Software Tab: "Building Services > HVAC Systems > Metering Provision"

Data Entry Item	Guidance	Documentary Evidence
Is this HVAC System separately sub-metered?	Answering "yes" to this input would require the Assessor to obtain documentary evidence demonstrating that the HVAC is separately metered. Note: The HVAC system must be metered separately to other uses within the building. For example, a chiller and AHU must be metered separately to Lighting/ Plug in loads. Similarly, a gas fired heating source must be metered separately to gas used for cooking.	The evidence required in order to answer "Yes" is met by one of the following • Copy of As Built electrical schematics showing meters for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Letter from an electrical contractor advising that he has checked the system in the last 12 months and confirming that it is separately metered.
M&T with alarm for "out of range" values?	The Assessor should ascertain if such a system is installed, M&T system must have alarm for "Out of Range" values.	• The evidence required is details of M&T system from operational and maintenance manuals. Review the BMS to ensure that the system is in operation and/or review records for previous 12 months. • Design drawings and specifications for New Provisional BERs

7.15 iSBEMie Software Tab: "Building Services > HVAC Systems > System Controls"

Data Entry Item	Guidance	Documentary Evidence
Tick boxes where the listed controls are present	Ticking boxes indicates that the relevant control measure is in place. Ticking a box alone will not alter the calculated efficiency of the relevant HVAC system. Changes to the system efficiency are calculated separately based on the application of heating efficiency credits (where allowed) as described in the "**iSBEMie Software**	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat source plant (eg boiler nameplates and manufacturer name) and

	Tab: "Building Services > HVAC Systems > Heating" section of this document. Note: Ticking of a box will remove the relevant upgrade recommendation from the advisory report. Note: Each defined HVAC will have its own set of tick boxes.	manufacturer's data sheets; • Photographs of the system controls • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications;

7.16 iSBEMie Software Tab: "Building Services > HVAC Systems > Bi-valent Systems"

Data Entry Item	Guidance	Documentary Evidence
System details and percentage load for bi-valent heating systems	This field assists assessors with bi-valent and multi-valent system entry. Where a bi-valent or multi-valent system exists the additional system(s) to make a defined HVAC bi-valent or multi-valent can be entered here. Example: Boiler & Radiators and electric heat % load carried by each not known. Define the boiler & radiator-based system in the normal way. Go to the bivalent tab and add select "Direct or storage electric heater" for the heat source. Enter 1.0 for electrical efficiency. Enter 50% for the % Load. Note: Any user-defined HVAC can have a bi-valent aspect added to it. In the case of a building with more than one user-defined HVAC, ensure the "Record selector" field at the top of the bi-valent tab relates to the correct HVAC . Note: To delete an unwanted entry in the bi-valent list, select desired entry and press the delete button on your keyboard.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat source plant (e.g. boiler nameplates and manufacturer name) and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Where no data is available on the percentage load assume 50%.

7.17 iSBEMie Software Tab: "Building Services > HWS"

Data Entry Item	Guidance	Documentary Evidence
Generator Type	Select from the Generator Types. In the case of multiple tenants/premises in a building: • Where the hot water services are supplied to	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS plant (eg boiler nameplates and

	each tenant by a central water heating system, (e.g. from the landlord to the tenant's premises) the efficiency and storage volume should be based on the details of that central system. Where this information is not available default data must be used. • Where the hot water services are part of the tenant's system, the efficiency and storage volume should be based on the details of the tenant's services. Where this information is not available default data must be used. In the case where more than one HWS serves a building, the HWS system that is assigned to a zone is the HWS system that accounts for the majority of the HWS demand in that zone. To identify the system that serves the majority of the HWS demand, determine what each system serves and the associated hot water demand for each system. Note: Where a heat pump provides both heating and hot water "Heat Pump" should be selected and NOT as "same as HVAC". The efficiency will differ between space heating and hot water generation and so selecting "Heat Pump" will allow a separate efficiency to be entered. Refer to Appendix A4.3 of this document for guidance on default system entry or when there is no hot water system present in the building.	manufacturer name); • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Tick if the generator is later than 1998	Answering "yes" to this input would require the Assessor to obtain documentary evidence to substantiate date of construction of the building or date of any remedial work carried out.	The evidence required is met by one of the following: • Refer to documentary evidence from Age of Building; • Copies of technical data sheets from operational and maintenance manuals; • Photographs of HWS plant nameplates showing year of manufacture and/or CE marking; • As Built drawings and specifications.

Fuel Type	Select from the Fuel Types For further guidance on the selection of solid fuel types refer to Appendix 10 of this document.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS plant (eg boiler nameplates and manufacturer name) and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications.
Do you know the effective heat generating seasonal efficiency?	Default values should only be used if it is not possible to obtain the HWS plant efficiency data required with evidence to substantiate this, such as correspondence from manufacturer stating that efficiency is not available. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant standard. • ECA/ ACA websites, where technology has been tested to the relevant test performance standard.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS plant (eg boiler nameplates and manufacturer name) and manufacturer's data sheet; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Is the system a storage system	The Assessor must ascertain if the HWS system has a storage system. If SES (Solar Energy System) is applied to the Hot Water System, it is assumed that hot water storage exists.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS Cylinder and nameplates and manufacturer name; and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs;

		• Design drawings and specifications for New Provisional BERs;
Storage Volume/ Storage Losses	The storage volume, insulation type and thickness are entered if the storage losses in MJ/month are unknown. If no value is entered, iSBEMie uses default values. Where storage volume is not available from other sources, and storage is accessible, estimate storage volume by measuring the dimensions of the storage vessel. Refer to Appendix 9 of this document for guidance on determining the storage volume of the storage unit. The Assessor should use default values only if it is not possible to obtain the HWS plant data or measure volume on site and should have evidence to substantiate this. Where storage insulation details are not available from other sources, and insulation is accessible, estimate insulation depth by measuring its thickness (e.g. using a pin). Default hot water cylinder insulation thicknesses in Appendix A4.3 of this document are used if insulation is inaccessible.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS Cylinder and nameplates and manufacturer name and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; Design drawings and specifications for New Provisional BERs;. • Hot water storage volume measured on site (and evidence of any calculations retained by the Assessor)
Does the System have Secondary Circulation	The Assessor must ascertain if the HWS system has secondary circulation.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of secondary pipework and pump(s); • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;.
Circulation Losses/ Pump Power/ Loop Length	If no values are entered, iSBEMie uses default values. If the circulation losses are defaulted iSBEMie will use a value of 15W/m2. In order to comply	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS pump(s) and nameplates and manufacturer

	with TGD Part L 2017 – Buildings Other than Dwellings pipework should be insulated to Table G.1 of theTGD L document with the exception of where heat can be demonstrated as "always useful". Refer to Appendix 9 of this document for guidance for calculating the circulation losses. The loop length may be observable in a factory or a partially finished building. The Assessor should use default values when the loop cannot be observable or determined from As Built drawings and if it is not possible to obtain the HWS plant details and should have evidence to substantiate this.	name and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Heat Losses from pipework in compliance with relevant standards.
Tick if there is Time Control on Secondary Circulation	The Assessor must ascertain if the HWS system has time control on secondary circulation.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of secondary time controls; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Bi-valent sub-tab	A bi-valent or multi-valent system may be defined for a HWS if required. Refer to **iSBEMie Software Tab: "Building Services > HVAC Systems > Bi-valent Systems"** In this document for details on system entry.	Same requirement as i**SBEMie Software Tab: "Building Services > HVAC Systems > Bi-valent Systems" section of this document**

7.18 iSBEMie Software Tab: "Building Services > SES"

Data Entry Item	Guidance	Documentary Evidence
In HWS	Select from the HWS that the Solar Hot Water Heating Applies.	In conjunction with the external survey details, the evidence required is met by one of the following: • Copies of technical data sheets from operational and Maintenance Manuals;

		• As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Area	Enter the aperture area of the solar collectors	The evidence required is met by one of the following: • Copies of technical data sheets measured in accordance with EN 12975 or data from the HARP database; • Sources of non-default data as outlined in Section 6.1 of this document; • External survey data on Survey Form with dimensions and orientation and photographs of solar collectors; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Orientation	Select from the available options	The evidence required is met by one of the following: • External survey data on Survey Form with dimensions and orientation and photographs of solar collectors. Use a directional compass; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Inclination	Select from list of angles between 0^{O} to 90^{O}. 0^{O} tilt represents a horizontal surface 90^{O} tilt represents a vertical surface	The evidence required is met by one of the following: • External survey data on Survey Form with dimensions and inclination and photographs of solar collectors; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;

Do you know the collector performance parameters from EN 12975-2	The default values are used based on the collector selected if it is not possible to obtain the performance parameters for the collector.	The evidence required is met by one of the following: • Photographs of solar collectors with nameplate and manufacturer's data sheets measured to EN 12975-2 by a body with relevant accreditation or data from the HARP database; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from Operational and Maintenance Manual measured to EN 12975-2 by a body with relevant accreditation; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Solar Storage	The dedicated solar storage volume associated with the solar panel, insulation type and thickness are entered. Appendix 9 of this document provides guidance on determining the storage volume of storage units when manufacturers data is not available, while Section 3.5.4 of How to use iSBEMie (Volume 2) gives criteria for determining the dedicated solar storage volume for various arrangements.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS Cylinders and nameplates and manufacturer name and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Hot water storage volume measured on site (and evidence of any calculations retained by the Assessor)
Do you know the heat transfer rate of the heat exchanger in the collector loop?	Enter "There is no heat exchanger" if the system is a direct system. Enter "No, use the default" if there is a heat exchanger and it is not possible to obtain the performance data for the heat exchanger. Enter "Yes, value is…" if the value is known. Refer to Section 3.5.4 of How to use iSBEMie (Volume 2) for guidance.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of HWS Cylinders and nameplates and manufacturer name and manufacturer's data sheet;

		• Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Do you know the overall heat loss coefficient of all pipes in the collector loop?	Enter "No, use the default" if it is not possible to obtain the performance data for the pipework in the collector loop. Enter "Yes, value is" if the value is known. Refer to Section 3.5.4 of How to use iSBEMie (Volume 2) for guidance.	In conjunction with the plantroom survey details, the evidence required is met by one of the following along with provision of representative photographs of the pipework: • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Are the distribution pipes between the SES and the back-up system insulated?	This only becomes active if there is a separate solar cylinder to the HWS cylinder.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of pipework; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Auxiliary Energy Consumption	Select from the circulation systems listed in the database.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of pumps and nameplates and manufacturer name and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;

7.19 iSBEMie Software Tab: "Building Services > PVS"

Data Entry Item	Guidance	Documentary Evidence
Type: Enter if peak power is NOT known	Select from the list of PV types. • Mono crystalline silicon • Multi crystalline silicon • Multi-layer thin film amorphous silicon • Other thin film layers • Thin film copper-indium-gallium-diselenide • Thin film cadmium-telluride The assessor should select "Other thin film layers" if type is not known.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of PV panels and nameplates and manufacturer name and manufacturer's data sheet; • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Area Enter if peak power is NOT known	Enter the Area of the PV	The evidence required is met by one of the following: • Photographs of Photovoltaics and copies of technical data sheets from manufacturer; • Photographs of Photovoltaics and External survey data on Survey Form with dimensions and orientation; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Peak Power	Where there is sufficient data available, the peak power may be entered directly as an alternative to iSBEMie calculating the peak power based on the array type and area.	The evidence required is met by one of the following: • Photographs of Photovoltaics and copies of technical data sheets from manufacturer in compliance with standard, refer to Section 6.1 of this document; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;

Orientation	Select from one of the available options	The evidence required is met by one of the following: • External survey data on Survey Form with dimensions and orientation with photographs of PV. Use a directional compass; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Inclination	Select from list of angles between 0^{O} to 90^{O}. 0^{O} tilt represents a horizontal surface 90^{O} tilt represents a vertical surface	The evidence required is met by one of the following: • External survey data on Survey Form with dimensions and inclination and photographs of PVs; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Overshading	Select from the drop-down list the level of over-shading of the PV array. , aided by the definitions in table 10 in Section 3.5.5 of How to use iSBEMie (Volume 2). It should be assessed taking into account the inclination of the panels.	The evidence required is met by one of the following: • External survey data with dimensions and orientation with photographs of PV. • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Ventilation strategy	Select from the drop-down list the ventilation strategy for the PV array, aided by the definitions in table 11 in Section 3.5.5 of How to use iSBEMie (Volume 2). The default selection is "Unventilated modules". The level of ventilation will depend on the cell technology in the PV array so guidance should be sought from the manufacturer if not available on the technical data sheets.	The evidence required is met by one of the following: • External survey data with dimensions and orientation with photographs of PV. As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

7.20 iSBEMie Software Tab: "Building Services > Wind Generators"

Data Entry Item	Guidance	Documentary Evidence
Terrain Type	Select from the list of Terrain types.	In conjunction with the external survey details, the evidence required is met by one of the following: • Photographs of surrounding sites; • Site plan showing surrounding sites.
Horizontal Axis - Diameter	Enter the Diameter of the Wind Turbine	The evidence required is met by one of the following: • Copies of technical data sheets from manufacturer; • External survey data on Survey Form with dimensions and photographs of wind turbines; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Others - Area	Enter the Area Swept by the rotor blades. Refer to Section 3.5.6 of How to use iSBEMie (Volume 2) for details	The evidence required is met by one of the following: • Copies of technical data sheets from manufacturer; • External survey data on Survey Form with dimensions and photographs of wind turbines; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Height	Enter the height by the wind turbine. Refer to Section 3.5.6 of How to use iSBEMie (Volume 2) for details.	The evidence required is met by one of the following: • Copies of technical data sheets from manufacturer; • External survey data on Survey Form with dimensions and photographs of wind turbines; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
kW	Enter the wind turbine rated power	The evidence required is met by one of the following: • Copies of technical data sheets

		from manufacturer and photographs of wind turbines nameplate; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

7.21 iSBEMie Software Tab: "Building Services > CHP generator"

Data Entry Item	Guidance	Documentary Evidence
Fuel Type	Select from the Fuel Types	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of CHP nameplates and manufacturer name and manufacturer's data sheets; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Heat Efficiency	Seasonal thermal efficiency of the CHP generator, defined as the total annual useful heat supplied by the generator divided by the total annual fuel energy input to the generator (using the gross calorific value).	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of CHP nameplates and manufacturer name and manufacturer's data sheets in compliance with the national standards or the CHP EU directive or EN 15316-4-4; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Electrical Efficiency	Total annual electric power output by the CHP divided by the total annual fuel energy input (using the gross calorific value).	In conjunction with the plantroom survey details, the evidence required is met by one of the following:

		• Photographs of CHP nameplates and manufacturer name and manufacturer's data sheets in compliance with the national standards or the CHP EU directive or EN 15316-4-4; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Building Space Heat Supplied	Ascertain the proportion of space heating supplied to the building by the CHP plant.	For existing buildings, a report from the Building Operator detailing the proportion of space heating supplied to the building by the CHP plant. Where submetering of the heat is unavailable, the report should be based on actual fuel consumption converted into heat consumption based on the actual plant performances for a 12-month period. This method is only acceptable when there is no "heat dump" For new buildings, a report signed by engineers from the Design Team, detailing the predicted proportion of space heating supplied by the CHP plant.
Building Hot Water Supplied	Ascertain the proportion of hot water heating supplied to the building by the CHP plant.	For existing buildings, a report from the Building Operator detailing the proportion of hot water supplied to the building by the CHP plant. Where submetering of the hot water is unavailable, the report should be based on actual fuel consumption converted into hot water consumption based on the actual plant performances for a 12-month period. This method is only acceptable when there is no "heat dump". For new buildings, a report signed by engineers from the Design Team,

		detailing the predicted proportion of hot water supplied by the CHP plant.
Tick this box for Trigeneration systems	Ascertain if the building has a Trigeneration system.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of CHP nameplates and manufacturer name and photographs of cooling System (absorption chiller and nameplate); • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.
Building Cooling Supplied	The Assessor must ascertain the proportion of cooling supplied to the building by the Trigeneration system	For existing buildings, a report from the Building Operator detailing the proportion of cooling supplied to the building by the Trigeneration. Where submetering of the chilled water is unavailable, the report should be based on running time for the plant over a 12-month period and the actual plant performances. For new buildings, a report signed by engineers from the Design Team, detailing the predicted proportion of space cooling supplied by the CHP.
Chiller Efficiency	The seasonal chiller efficiency of the generator, defined as the cooling demand divided by the cooling energy for the generator.	In conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of CHP nameplates and manufacturer name and photographs of cooling System (absorption chiller nameplate) and manufacturer's data sheets; • Copies of technical data sheets from operational and maintenance manuals; • Sources of efficiency as outlined in Section 6.1 of this document;

		As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

7.22 iSBEMie Software Tab: "Building Services > Zones > Solar Collectors"

Data Entry Item	Guidance	Documentary Evidence
Solar Collector Parameters	Refer to Section 3.5.8 of How to use iSBEMie (Volume 2) for details on data entry. Note: The user must define specific wall elements in the Project database to represent "non-transpired" solar collectors which form part of the building structure as opposed to add-on equipment.	The evidence required is met by one of the following: • Photographs of solar collectors and copies of technical data sheets from manufacturer; • Photographs of solar collectors and External survey data on Survey Form with dimensions and orientation; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs.

7.23 iSBEMie Software Tab: "Building Services > Zones > HVAC, HWS & Lighting Systems"

Data Entry Item	Guidance	Documentary Evidence
Deadleg Length in this zone	Length of draw off pipe to the outlet in the space (only used in zones where the water is drawn off). The deadleg distance is measured from the edge of the zone or from the storage vessel/ circulation in the zone to the outlet point. Where pipework is not visible in the zone and drawings are unavailable, allow for the deadleg running from the edge of the zone or from the storage vessel/ circulation in the zone to the outlet point.	The evidence required is met by one of the following: As Built mechanical drawings marked up to show zones for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs. • Sketches of zones/ pipework showing dimensions. • Photographs of pipework.

7.24 iSBEMie Software Tab: "Building Services > Zones > Ventilation"

Data Entry Item	Guidance	Documentary Evidence

Zonal Ventilation Type	If not previously included in the HVAC system, the Assessor may select "Natural" or "Mechanical Supply/Extract" to a zone. In situations where the supply and extract elements of a ventilation system are located in different zones, but form one system, enter that both zones have mechanical supply/ extract ventilation. An example might be air supplied to a corridor outside a toilet and then extracted in the toilet. Can also occur in healthcare zones such as operating theatres.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: As Built mechanical drawings marked up to show zones for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Survey Form and photographs.
Do you know the Supply/ Extract SFP?	There is an onus on the Assessor to make reasonable efforts to find and use the fan details and to resort to the default value only if the information is not available. The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D Calculation and Appendix E of the TGD Part L 2017 – Buildings Other than Dwellings. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard.	The evidence required is met by one of the following: • Photographs of fan nameplates and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; Calculations of SFP must be retained in all cases.
Does activity require high pressure drop air treatment	The Assessor must ascertain if high pressure drop air treatment is required or alternatively use the default based on selected activity.	If non-default values are used the Assessor must obtain drawings and specification showing high pressure drop air treatment.
Demand Controlled Ventilation	The Assessor may select the type of control for Demand Controlled Ventilation in a zone if it is present.	The evidence required is met by one of the following: • Photographs of ventilation system and controls including

		either photographs of relevant sensors or photograph of BMS showing sensors • Copies of technical data sheets from operational and maintenance manuals; • As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs;
Ventilation - Heat Recovery	The heat recovery system may be incorporated within the air handling unit(s) or it may be external. The Assessor must establish whether or not heat recovery is fitted	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of heat recovery unit; • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. For New Provisional BERs, design drawings and specifications.
Tick if variable heat recovery efficiency	Tick box if documentary evidence is available to show that the heat recovery system can be bypassed or switched off in summer.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of bypass/ controls; • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. For New Provisional BERs, design drawings and specifications.
Heat Recovery Seasonal Efficiency	The default value must be used for efficiency if there is no documentary evidence to substantiate non-default entries.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:

	A non-default value should be used where possible. Non-default efficiency values must be in compliance with the Commission Regulation (EU) 1253/2014 with regard to Ecodesign requirements for ventilation units. Non-default efficiencies may be obtained from the following sources as per Section 6.1: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard	• Photographs of heat recovery unit; • Copies of technical data sheets from operational and maintenance manuals • Sources of efficiency as outlined in "Guidance" and Section 6.1; • As Built drawings and specifications. For New Provisional BERs, design drawings, specifications and sources of efficiency as outlined in "Guidance" and Section 6.1.
Tick Box for Night Cooling	The Assessor may select that there is Night Cooling provided in a zone.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of controls demonstrating night cooling; • Copies of technical data sheets from operational and maintenance manuals For New Provisional BERs, design specifications
Max Hours of Night Cooling (NC) per month	Where documentary evidence is available, enter the maximum number of hours per month during which night cooling is operating in the zone.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Photographs of controls demonstrating night cooling operational hours; • Copies of technical data sheets from operational and maintenance manuals demonstrating night cooling operation hours For New Provisional BERs, design specifications

Max flow rate during Night Cooling (NC) hours	Where documentary evidence is available enter the max. flow rate during NC hours - This is the maximum air flow rate in the zone, in l/s.m2 of floor area, during the operation of night cooling.	For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following: • Copies of technical data sheets from operational and maintenance manuals demonstrating the commissioned night cooling flow rate For New Provisional BERs, design specifications
Specific Fan Power for Night Cooling	There is an onus on the Assessor to make reasonable efforts to find and use the fan details and to resort to the default value only if the information is not available. The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D Calculation and Appendix E of the TGD Part L 2017 – Buildings Other than Dwellings. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. Accredited Test certificates to the relevant test performance standard.	The evidence required is met by one of the following: • Photographs of fan nameplates and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; Calculations of SFP must be retained in all cases.
Specific Fan Power for the system terminal Units	This parameter becomes active if the HVAC system type serving the zone is selected to be 'Fan coil systems' or 'Indoor packaged cabinet (VAV). It allows users to enter the SFP for the terminal unit(s) in the zone. The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007	The evidence required is met by one of the following: • Photographs of fan nameplates and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance

	Annex D Calculation and Appendix E of the TGD Part L 2017 – Buildings Other than Dwellings. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard.	manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; Calculations of SFP must be retained in all cases.

7.25 iSBEMie Software Tab: "Building Services > Zones > Exhaust"

Data Entry Item	Guidance	Documentary Evidence
Is there local mechanical exhaust in the zone	The Assessor must ascertain if there is mechanical exhaust from a zone	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • As Built mechanical drawings marked up to show zones; • Survey Form and photographs.
Local Mechanical Exhaust	The Assessor must determine the l/s/m² floor area. Default values can be obtained from CIBSE Guide F Part A or Appendix A4.8 of this document.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: As Built mechanical drawings marked up to show zones for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; • Photos of fan nameplates showing Model number and Flow rate; • Survey Form and photographs. For New Provisional BERs, design specifications
Do you know the Supply/ Extract SFP?	There is an onus on the Assessor to make reasonable efforts to find and use the fan	The evidence required is met by one of the following:

	details and to resort to the default value only if the information is not available. The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D Calculation and Appendix E of the TGD Part L 2017 – Buildings Other than Dwellings. Non-default efficiencies may be obtained from the following sources: • Performance data on "CE marked" literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard.	• Photographs of fan nameplates and manufacturer's data sheets; • Sources of efficiency as outlined in Section 6.1 of this document; • Copies of technical data sheets from operational and maintenance manuals; As Built drawings and specifications for New Final or Existing BERs; • Design drawings and specifications for New Provisional BERs; . Calculations of SFP must be retained in all cases.

7.26 iSBEMie Software Tab: "Building Services > Zones > Lighting"

Data Entry Item	Guidance	Documentary Evidence
What information is available on Lighting?	The design illuminance, in lux is entered here. If there is no such data available, the field is left blank. The Assessor has a choice on how the wattage is entered. Select from: • Full lighting design carried out • Lighting chosen but calculation not carried out • Lighting Paramenters not available	Refer to the individual sections below. • As Built drawings and specifications and lighting calculations for New Final or Existing BERs; • Design drawings and specifications and lighting calculations for New Provisional BERs; • Photographs of Lighting and Lighting Controls.

Full lighting design carried out	Total wattage: This value should be for the lighting system, i.e., it includes the luminaires and ballasts (control gear). The total wattage should be for the fixed light fittings only. Where task lighting is "plug in" lighting it should not be included in the model. It is recommended that the actual lighting type be entered in the "Lighting Parameters not available" field as it will change recommendations on the Advisory Report.	In order to use the "Full lighting design carried out" entry the Assessor must have a signed statement from a suitably qualified consultant (normally the M&E engineers) responsible for the lighting design showing: In the case of a Provisional BER, the design power and design illuminance for each of the zones. In the case of a New Final and Existing BER, • the installed power and installed illuminance for each of the zones. • photographs of lighting and lighting controls. When information is insufficient for a particular zone the data entry must be made using the other data entry method below.
Lighting chosen but calculation not carried out	Both fields require data entry. Lamp lumens per circuit wattage: This is the value in lumens for the lamp / bulb in the fitting. The lamp lumen per circuit wattage should be for the fixed light fittings only. Where task lighting is "plug in" lighting it should not be included in the model. Light output ratio (LOR): This value between 0.1 and 1.0 represents the efficiency of the luminaire / fitting to distribute the light from the lamp / bulb. Note: If the value available is the luminous efficacy of the luminaire, rather than that of the lamp, then you can enter the luminaire value into iSBEMie with a LOR of 1.0 "Control Factors" should not be included in calculations. It is recommended that the actual lighting type	In conjunction with the floor by floor sketches, the evidence required is met by Manufacturers Data Sheets plus the following: • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Survey Form • Photographs of light fittings. Photograph(s) of each light type should be provided. When information is insufficient for a particular zone the data entry must be made using the "Lighting Parameters not available" data entry method below.

	be entered in the "Lighting Parameters not available" field as it will change recommendations on the Advisory Report.	
Lighting Parameters not available	Determine the lamp type for each zone. Where the specific fitting cannot be identified, take the most conservative (lowest lumens per circuit watt) option from Table 12 in How to use iSBEMie (Volume 2) Note: The "Don't know" option is no longer available. In situations where the lighting type is unknown "Tungsten" is assumed. Refer to Appendix 11 of this document for guidance on selection of lamp type. Refer to Appendix 4.7 of this document for the details on how Shell and Core buildings are dealt with. Where a combination of lighting systems is present in the zone providing general lighting (no display lighting), the zone should be split to reflect the lamp locations. Where a combination of lighting systems is present in the zone providing general lighting (no display lighting) across the entire zone, such that splitting the zone to reflect the lamps location is not practicable (For example the zone contains a combination of fluorescents and LED down lighters mixed throughout the zone) then the average performance is determined as follows: • The proportion of the zone's area lit by each lamp type is established. • Calculate average performance based on Table 12 of iSBEM User Guide. For example, assuming 60% of floor area is fluorescents, 22.5 lumen/cW from Table 12 and 40% of floor area is LED, 50 lumen/cW 0.6 x 22.5 + 0.4 x 50 = 33.5 • Select equivalent lamp from Table 12, ie closest performance below value. In this case	In conjunction with the floor by floor sketches, the evidence required is met by the following: • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Survey Form • Photographs of light fittings. Photograph(s) of each light type should be provided.

	T8 Fluorescent – halophosphate – high frequency ballast.	
Are air extracting luminaires fitted	The Assessor must determine if air extracting luminaires are fitted.	In conjunction with the floor by floor sketches, the evidence required is met by the following: • As Built Electrical Lighting Drawings marked up to show zones; • Survey Form and photographs of light fittings.

7.27 iSBEMie Software Tab: "Building Services > Zones > Lighting Controls"

Data Entry Item	Guidance	Documentary Evidence
Lighting Controls	The Assessor must determine the lighting controls within the zone.	In conjunction with the floor by floor sketches, the evidence required is met by the following: • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Survey Form • Photographs of lighting controls.
Local Manual Switching	Determine if occupants can control the luminaries individually and if light switch is within 6m of the luminaries it controls.	In conjunction with the floor by floor sketches, the evidence required is met by the following: • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Survey Form • Photographs of lighting switches.

Photoelectric Options	Determine the type of switching, whether a different sensor controls the back of the zone, the type of sensor and the Parasitic Power of the sensor. Refer to Section 3.5.9 of How to use iSBEMie (Volume 2). Establish whether or not the sensor has a photoelectric function, by carrying out on site tests or obtaining technical data sheets detailing the light control functions in each zone.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • As Built electrical lighting drawings and specification marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Survey Form • Photographs of lighting controls; • Technical data sheets on the lighting controls from Operational and Maintenance manuals.
Photoelectric Options – Parasitic Power	The parasitic power or the standby power is the power required to operate the lighting controls and detectors.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • Technical data sheets on the lighting controls from Operational and Maintenance manuals.
Occupancy Sensing	Determine the type of Occupancy Sensing Controls and the Parasitic Power of the sensor Refer to Section 3.5.9 of How to use iSBEMie (Volume 2).	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • As Built electrical lighting drawings and specification marked up to show zones for New Final and Existing Buildings; • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional; • Survey Form and photographs of lighting controls; • Technical data sheets on the lighting controls from Operational and Maintenance manuals.
Occupancy Sensing – Parasitic Power	The parasitic power or the standby power is the power required to operate the lighting controls and detectors.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • Technical data sheets on the

		lighting controls from Operational and Maintenance manuals.

7.28 iSBEMie Software Tab: "Building Services > Zones > Display Lighting"

Data Entry Item	Guidance	Documentary Evidence
Does the display lighting use efficient lamps? Is there time switching?	This section becomes active when iSBEMie assumes the presence of display lighting. The following zone types are given display lighting by iSBEMie: Display Area, Retail Sales areas (all types), Reception (all types of building), Consulting Rooms and Operating Theatres. The default power density used can be high and so it is important to adjust the lamp luminous efficacy if required. Refer to Appendix 4.9 of this document for guidance on reducing the power allocated in the cases where the display lighting is "low energy" or where none is actually present.	In conjunction with the floor by floor sketches, the evidence required is met by one of the following: • As Built electrical lighting drawings and specification marked up to show zones; • Survey Form and photographs of lighting controls; • Technical data sheets on the lighting controls from the operational and maintenance manuals.

Appendix 1: The NEAP Survey Form

NEAP SURVEY FORM

Name:	**Assessor / BER reg. no.**
Address:	**Survey Date:**
MPRN	**Building Type**

Age: Building	**Age: Extension 1**	**Age:Extension 2**	
☐ Evidence 1 ☐ Evidence 2	☐ No Extension ☐ Evidence 1 ☐ Evidence 2	☐ No Extension ☐ Evidence 1 ☐ Evidence 2	**number of storeys**

Air Test ?	**Thermal Bridging ?**	**Building Type(s)**	**Type of Rating**
☐ Default 25 ☐ Cert available	☐ Default ☐ Data available		☐ new-provisional ☐ new-final building ☐ existing building

Wall construction Main Wall Type 1*	**Roof Construction: Main Roof***	**Ground Floor Construction: Main Floor***
Wall construction Wall Type 2*	**Roof Construction: Roof Type 2***	**Ground Floor Construction: Floor Type 2***
Wall construction Wall Type 3*	**Roof Construction: Roof Type 3***	**Internal Floor Construction: Floor Type 3***
Wall construction Wall Type 4*	**Construction: Type ***	**Construction: Type ***

Window Construction: Wall windows 1	**Window Construction: Roof windows 1**	**Door Construction: Personnel door(s)***
Non-Default Data? N Y	Non-Default Data? N Y	
Material Alu ☐ PVC ☐ W ☐	Material Alu ☐ PVC ☐ W ☐ None ☐	Door make-up Type 1:
Thermal break N ☐ Y ☐	Thermal break N ☐ Y ☐	
Low E N ☐ Y ☐	Low E N ☐ Y ☐	
Argon Gas N ☐ Y ☐	Argon Gas N ☐ Y ☐	Door make-up Type 2:
Glazing make-up :	Glazing make-up :	

Window Construction: Wall windows 2	**Window Construction: Wall windows 2**	**Door Construction: Vehicle Access door(s)**
Non-Default Data? N Y	Non-Default Data? N Y	
Material Alu PVC W	Material Alu PVC W	Door make-up Type 1:
Thermal break N ☐ Y ☐	Thermal break N ☐ Y ☐	
Low E N ☐ Y ☐	Low E N ☐ Y ☐	
Gas Air / Other A ☐ O ☐	Gas Air / Other A ☐ O ☐	Door make-up Type 2:
Glazing make-up :	Glazing make-up :	

**note:Actual U-value should be calculated and used if the wall /roof /floor construction detail is available on site or through documentation.*
Substantiation supporting the U-value calculation is required. Non default U values should be recorded along with relevant calculation in Assessor's records
Reprint this page as often as required (e.g. Multiple extensions or more than four wall types etc)

HVAC System Heating ONLY

HVAC SYSTEM TYPE 1 - HEATING ONLY

HVAC System
[Ventilation can be applied in a zone if required]

Local Heating Systems (heat source in zone)
- ☐ Other local room heater - fanned (b)
- ☐ Other local room heater - unfanned
- ☐ Unflued radiant heater (a)
- ☐ Flued radiant heater (a)
- ☐ Multiburner radiant heaters (a)
- ☐ Flued forced-convection air heaters
- ☐ Unflued forced-convection air heaters

Radiant Efficiency (a)
- ☐ Default
- Non-Default Value = _____

Aux Energy (b)
- ☐ Default
- Non-Default Value = _____ kWh/kWh

Heating System Fuel
- ☐ mains gas ☐ biomass
- ☐ LPG ☐ waste heat
- ☐ Biogas ☐ Anthracite
- ☐ Oil ☐ Smokeless Fuel
- ☐ electricity ☐ Dual Fuel Appliances
- ☐ Coal ☐ **Uses CHP**

Heating Source (Local Heating)
- ☐ Direct OR storage electric heater
- ☐ Room heater (Open fire, stove)
- ☐ Flued Radiant heater
- ☐ Air heater
- ☐ Heat pump Type:
- ☐ Unflued radiant heater

Manufacturer / make / model number
- Boiler/ Heater :
- AHU:
- Other :

ECA/ETL,(ACA) Listed? ☐ Yes ☐ No

Heating System Efficiency
- ☐ Default before 1998 ☐ Open Fire Default
- ☐ Default post 1998 ☐ Non-Default Value _____

Central Heating Systems [heating by water]
- ☐ Central heating using water: radiators (c)
- ☐ Central heating using water: convectors (b), (c)
- ☐ Central heating using water: floor heating (c)

Aux Energy (b)
- ☐ Default
- _____ kWh/kWh

Variable Speed Pumps? (c)
- ☐ No Const. Speed
- ☐ Yes LTHW
- Sensor: P ☐ S ☐ M ☐

HVAC Metering Provision
- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Lighting Metering Provision
- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Heating Source (Central Heating)
- ☐ LTHW Boiler
- ☐ MTHW boiler
- ☐ HTHW boiler
- ☐ Heat pump air source
- ☐ Heat pump ground / water source
- ☐ District heating

Ventilation Heat Recovery (e) or by zone
- ☐ Plate heat exchanger ☐ Thermal wheel
- ☐ Heat-pipes ☐ Run around coil

Heat Recovery Seasonal Efficiency
- ☐ Default
- ☐ Non Default Value _____

Central Heating Systems [heating by air] (d),(e)
- ☐ Central heating using air distribution

Ventilation is included in this system

Variable Heat Recovery Efficiency ?
- ☐ Yes
- ☐ No

Specific Fan Power
- ☐ Default
- ☐ SFP: _____ W/l/s

Ductwork Leakage (d)
- ☐ Default
- ☐ Non Default
- Class: _____

AHU Leakage (d)
- ☐ Default
- ☐ Non Default
- Class: _____

System Controls
- ☐ Central Time Control ☐ Local Temperature Control
- ☐ Optimum Start/ Stop Control ☐ Weather Compensation Control
- ☐ Local Time Control

HVAC SYSTEM TYPE 2 - HEATING ONLY

HVAC System
[Ventilation can be applied in a zone if required]

Local Heating Systems (heat source in zone)
- ☐ Other local room heater - fanned (b)
- ☐ Other local room heater - unfanned
- ☐ Unflued radiant heater (a)
- ☐ Flued radiant heater (a)
- ☐ Multiburner radiant heaters (a)
- ☐ Flued forced-convection air heaters
- ☐ Unflued forced-convection air heaters

Radiant Efficiency (a)
- ☐ Default
- Non-Default Value = _____

Aux Energy (b)
- ☐ Default
- Non-Default Value = _____ kWh/kWh

Heating System Fuel
- ☐ mains gas ☐ biomass
- ☐ LPG ☐ waste heat
- ☐ Biogas ☐ Anthracite
- ☐ Oil ☐ Smokeless Fuel
- ☐ electricity ☐ Dual Fuel Appliances
- ☐ Coal ☐ **Uses CHP**

Heating Source (Local Heating)
- ☐ Direct OR storage electric heater
- ☐ Room heater (Open fire, stove)
- ☐ Flued Radiant heater
- ☐ Air heater
- ☐ Heat pump Type:
- ☐ Unflued radiant heater

Manufacturer / make / model number
- Boiler/ Heater :
- AHU:
- Other :

ECA/ETL,(ACA) Listed? ☐ Yes ☐ No

Heating System Efficiency
- ☐ Default before 1998 ☐ Open Fire Default
- ☐ Default post 1998 ☐ Non-Default Value _____

Central Heating Systems [heating by water]
- ☐ Central heating using water: radiators (c)
- ☐ Central heating using water: convectors (b), (c)
- ☐ Central heating using water: floor heating (c)

Aux Energy (b)
- ☐ Default
- _____ kWh/kWh

Variable Speed Pumps? (c)
- ☐ No Const. Speed
- ☐ Yes LTHW
- Sensor: P ☐ S ☐ M ☐

HVAC Metering Provision
- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Lighting Metering Provision
- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Heating Source (Central Heating)
- ☐ LTHW Boiler
- ☐ MTHW boiler
- ☐ HTHW boiler
- ☐ Heat pump air source
- ☐ Heat pump ground / water source
- ☐ District heating

Ventilation Heat Recovery (e)
- ☐ Plate heat exchanger ☐ Thermal wheel
- ☐ Heat-pipes ☐ Run around coil

Heat Recovery Seasonal Efficiency
- ☐ Default
- ☐ Non Default Value _____

Central Heating Systems [heating by air] (d),(e)
- ☐ Central heating using air distribution

Variable Heat Recovery Efficiency ?
- ☐ Yes
- ☐ No

Specific Fan Power
- ☐ Default
- ☐ SFP: _____ W/l/s

Ductwork Leakage (d)
- ☐ Default
- ☐ Non Default
- Class: _____

AHU Leakage (d)
- ☐ Default
- ☐ Non Default
- Class: _____

System Controls
- ☐ Central Time Control ☐ Local Temperature Control
- ☐ Optimum Start/ Stop Control ☐ Weather Compensation Control
- ☐ Local Time Control

*Replicate this page as required if there are more than two **Heating Only** HVAC systems.* ***See other worksheet for systems that include cooling.***

HVAC System Heating AND Cooling

HVAC SYSTEM TYPE 3 - HEATING and COOLING

HVAC System

Local Cooling System (Cooling coil in zone)

- ☐ Split or mulit-split system *
- ☐ Single Room Cooling system *
- ☐ Fan Coil Units **
- ☐ Water Loop Heatpump [RARE]

Heating System Fuel

- ☐ mains gas ☐ biomass
- ☐ LPG ☐ waste heat
- ☐ Biogas ☐ Anthracite
- ☐ Oil ☐ Smokeless Fuel
- ☐ electricity ☐ Dual Fuel Appliances
- ☐ Coal ☐ **Uses CHP**

Heating Source

- ☐ LTHW Boiler
- ☐ MTHW boiler
- ☐ HTHW boiler
- ☐ Heat pump air source
- ☐ Heat pump ground / water source
- ☐ District heating

Central Cooling System (Cooling coil on AHU)

- ☐ Constant volume system (fixed fresh air rate)
- ☐ Constant volume system (variable fresh air rate)
- ☐ Terminal reheat (constant volume)
- ☐ Dual duct (constant volume)
- ☐ Chilled ceilings or passive chilled beams
- ☐ Active chilled beams
- ☐ Single-duct VAV
- ☐ Dual-duct VAV
- ☐ Indoor packaged cabinet (VAV)
- ☐ Multizone (hot deck/cold deck) [RARE]
- ☐ Induction system [RARE]

Manufacturer / make / model number

Boiler :

AHU:

Chiller or Indoor/Outdoor Units

ECA/ETL, (ACA) Listed? Yes ☐ No ☐

Heating System Efficiency

- ☐ Default before 1998
- ☐ Default post 1998
- ☐ Non-Default Value _____

Cooling System Efficiency

- ☐ EER Default ☐ SEER Default
- ☐ EER Value : _____ ☐ SEER Value : _____

HVAC Metering Provision

- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Lighting Metering Provision

- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Cooling Source

- ☐ Heatpump (electric)
- ☐ Heatpump (gas/ oil)
- ☐ Air cooled chiller
- ☐ Water cooled chiller
- ☐ Remote-condenser chiller

Applied in zones tab:

* Ventilaton
** Terminal Unit SFP

Variable Speed Pumps? (c)

- ☐ No Const. Speed
- ☐ Yes LTHW & CHW

Sensor: P ☐ S ☐ M ☐

Ventilation Heat Recovery

- ☐ Plate heat exchanger ☐ Thermal wheel
- ☐ Heat-pipes ☐ Run around coil

Heat Recovery Seasonal Efficiency

- ☐ Default
- ☐ Non Default Value _____

Variable Heat Recovery Efficiency ?

- ☐ Yes
- ☐ No

Specific Fan Power

- ☐ Default
- ☐ SFP: _____ W/l/s

Ductwork Leakage

- ☐ Default
- ☐ Non Default
- Class: _____

AHU Leakage

- ☐ Default
- ☐ Non Default
- Class: _____

System Controls

- ☐ Central Time Control ☐ Local Temperature Control
- ☐ Optimum Start/ Stop Control ☐ Weather Compensation Control
- ☐ Local Time Control

Mixed Mode Operation

- ☐ Yes
- ☐ No

HVAC SYSTEM TYPE 4 - HEATING and COOLING

HVAC System

Local Cooling System (Cooling coil in zone)

- ☐ Split or mulit-split system *
- ☐ Single Room Cooling system *
- ☐ Fan Coil Units **
- ☐ Water Loop Heatpump [RARE]

Heating System Fuel

- ☐ mains gas ☐ biomass
- ☐ LPG ☐ waste heat
- ☐ Biogas ☐ Anthracite
- ☐ Oil ☐ Smokeless Fuel
- ☐ electricity ☐ Dual Fuel Appliances
- ☐ Coal ☐ **Uses CHP**

Heating Source

- ☐ LTHW Boiler
- ☐ MTHW boiler
- ☐ HTHW boiler
- ☐ Heat pump air source
- ☐ Heat pump ground / water source
- ☐ District heating

Central Cooling System (Cooling coil on AHU)

- ☐ Constant volume system (fixed fresh air rate)
- ☐ Constant volume system (variable fresh air rate)
- ☐ Terminal reheat (constant volume)
- ☐ Dual duct (constant volume)
- ☐ Chilled ceilings or passive chilled beams
- ☐ Active chilled beams
- ☐ Single-duct VAV
- ☐ Dual-duct VAV
- ☐ Indoor packaged cabinet (VAV)
- ☐ Multizone (hot deck/cold deck) [RARE]
- ☐ Induction system [RARE]

Manufacturer / make / model number

Boiler :

AHU:

Chiller or Indoor/Outdoor Units

ECA/ETL, (ACA) Listed? Yes ☐ No ☐

Heating System Efficiency

- ☐ Default before 1998
- ☐ Default post 1998
- ☐ Non-Default Value _____

Cooling System Efficiency

- ☐ EER Default ☐ SEER Default
- ☐ EER Value : _____ ☐ SEER Value : _____

HVAC Metering Provision

- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Lighting Metering Provision

- ☐ Yes, Submetered ☐ Yes, M&T Alarm
- ☐ No, Submetered ☐ No, M&T Alarm

Cooling Source

- ☐ Heatpump (electric)
- ☐ Heatpump (gas/ oil)
- ☐ Air cooled chiller
- ☐ Water cooled chiller
- ☐ Remote-condenser chiller

Applied in zones tab:

* Ventilaton
** Terminal Unit SFP

Variable Speed Pumps? (c)

- ☐ No Const. Speed
- ☐ Yes LTHW & CHW

Sensor: P ☐ S ☐ M ☐

Ventilation Heat Recovery

- ☐ Plate heat exchanger ☐ Thermal wheel
- ☐ Heat-pipes ☐ Run around coil

Heat Recovery Seasonal Efficiency

- ☐ Default
- ☐ Non Default Value _____

Variable Heat Recovery Efficiency ?

- ☐ Yes
- ☐ No

Specific Fan Power

- ☐ Default
- ☐ SFP: _____ W/l/s

Ductwork Leakage

- ☐ Default
- ☐ Non Default
- Class: _____

AHU Leakage

- ☐ Default
- ☐ Non Default
- Class: _____

System Controls

- ☐ Central Time Control ☐ Local Temperature Control
- ☐ Optimum Start/ Stop Control ☐ Weather Compensation Control
- ☐ Local Time Control

Mixed Mode Operation

- ☐ Yes
- ☐ No

*Replicate this page as required if there are more than two **Heating & Cooling** HVAC systems.* ***See other worksheet for systems that can provide HEATING ONLY.***

Heating system (Hot Water System)

Generator Type
- ☐ Dedicated hot water boiler
- ☐ Stand-alone water heater
- ☐ Instantaneous hot water only
- ☐ Instantaneous combi
- ☐ Heat pump
- ☐ Same as HVAC: _____

HWS System Fuel
- ☐ mains gas
- ☐ LPG
- ☐ Biogas
- ☐ Oil
- ☐ electricity
- ☐ Coal
- ☐ biomass
- ☐ waste heat
- ☐ other:

HWS System Age
- ☐ 1998 or later
- ☐ pre 1998

HWS System Efficiency
- ☐ Default
- ☐ Non Default

Manufacturer / make / model number

Hot Water Cylinder Storage System
- ☐ no access
- **Insulation:**
  - ☐ no insulation
  - ☐ lagging jacket
  - ☐ factory fitted
- ☐ capacity (litres) / or dimensions
- ☐ insulation thickness (mm)
- ☐ storage losses
- ☐ MJ/month

Secondary Circulation
- ☐ circulation losses (W/m) _____
- ☐ pump power (kW) _____
- ☐ loop length (m) _____
- ☐ time control on secondary circulation

Solar Water Heating

Collector Parameters
- ☐ none
- ☐ solar water heating present
- ☐ aperture panel area (m^2)
- ☐ orientation
- ☐ tilt °
- ☐ evacuated tube
- ☐ flat plate, glazed
- ☐ Unglazed
- ☐ Non Default

Manufacturer / make / model number

Solar Storage
- ☐ solar storage volume (litres)
- ☐ combined cylinder
- ☐ separate cylinder
- ☐ no insulation
- ☐ lagging jacket
- ☐ factory fitted
- ☐ insulation thickness (mm)

Collector Loop

Heat Transfer Rate of Heat Exchanger
- ☐ no heat exchanger
- ☐ default
- ☐ non default _____

Heat Loss Coeff of all Pipes
- ☐ default
- ☐ non default _____

Photovoltaics

Parameters
- ☐ none
- ☐ Use Peak Power
- ☐ Mono crystalline silicon
- ☐ Multi crystalline silicon
- ☐ Multi layer thin film amorphous silicon
- ☐ Other thin film layers
- ☐ Thin film copper-indium-gallium-diselenide
- ☐ Thin film cadmium-telluride
- ☐ Area m2
- ☐ Orientation
- ☐ Inclination

Overshading
- ☐ None or very little (<20%)
- ☐ Modest (20-60%)
- ☐ Significant (60-80%)
- ☐ Heavy (>80%)

Ventilation Strategy
- ☐ Strongly ventilated or forced ventilated modules
- ☐ Moderately ventilated modules
- ☐ Unventilated modules

Manufacturer / make / model number

Wind Generator

Parameters
- ☐ none
- ☐ turbine present
- ☐ Smooth flat country (no obstacles)
- ☐ Farm land with boundary hedges
- ☐ Suburban or industrial area
- ☐ Urban with average building height > 15m
- ☐ horizontal axis, m
- ☐ Swept Area, m2
- ☐ height,m
- ☐ power,kW

Manufacturer / make / model number

CHP

Parameters
- ☐ none
- ☐ chp present
- ☐ tri generation present

Fuel
- ☐ mains gas
- ☐ LPG
- ☐ Biogas
- ☐ Oil
- ☐ Coal
- ☐ biomass
- ☐ Anthracite
- ☐ Smokeless Fuel
- ☐ Dual Fuel Appliances

Efficiency
- ☐ Heat Efficiency
- ☐ Electrical Efficiency

Heat Supplied
- ☐ Building Space Heat Supplied, %
- ☐ Building Hot Water Supplied, %

Tri Generation
- ☐ Building Cooling Supplied, %
- ☐ Chiller Efficiency

CHP Manufacturer / make / model number

Chiller Manufacturer / make / model number

Any other comments or details on assessment including items observed which affect the rating but not shown elsewhere on survey form/sketches.

Reprint this page if multiple CHP, DHW, Solar, PV or Wind systems present

ZONES: BUILDING SERVICES DETAILS

Zone name	Description	Building type	SBEM Activity	Area m2	Height m	Which HVAC system*?	Zonal ventilation? Y / N	Zonal Mechanical exhaust? Y / N	Ventilation part of HVAC? Y / N	DHW generator name	DHW deadleg length m	Lighting: What information	Total W lumens/W lamp type	Display high eff.lamps	Lighting controls Manual or Auto M / A	Switching or Dimming S / D	Back sensor Y/N?	Occupancy sensing	Photoelectric (daylight) sensor
z0/00	Example tea area in office	Office	Generic Office Area	9	3.1	Heating only	N	N	N	DHW 1	0	Visual Survey	T-8 standard	N/A	A	S	N	Y	N
Copy Format Above for other zones																			

ZONES: GEOMETRICAL DETAILS

Adjacent spaces: CAS= Conditioned adjoining space; Ext=Exterior, Und=Underground, UAS=Unheated adjoining space, UASPC=UAS - partially conditioned by surrounding spac
Shading type: None,Ext, or Int Colour = W,P,D or B. Translucency = Opaque, Med, or High. Brise-Solei: Y or N

SEAI:Fields (orientation etc) to be updated based on the actual survey.

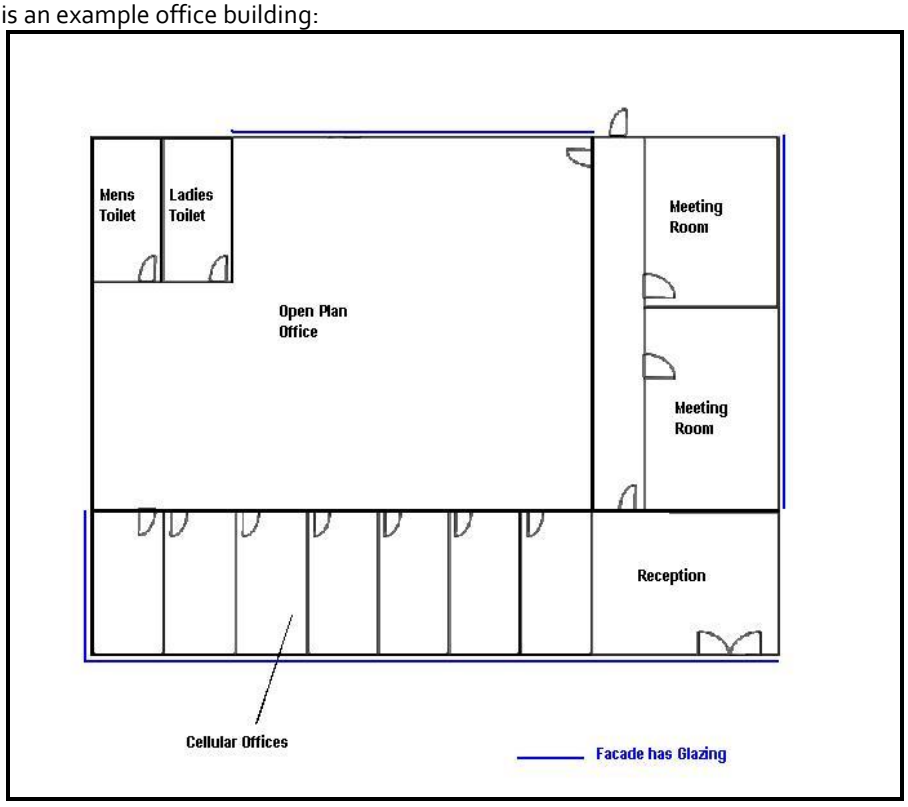
Basic zone information							Envelope elements							windows and doors												doors only
Zone name	Description	Building type	Activity#	Area m2	Height m	HVAC system	Element name$	Wall, Roof (Pitch angle)	Orientation NESWH	Adjacent space	Construction name*	Length walls only, (Perimeter)	Area m2	Window name/Door name$	Glazing/door construction name*	Width	Height	Aspect Ratio	Area m2	or % glazed (instead of area)	Frame Type	Window Width/ Gap Width	Gap Gas	Shading type	Transmission factor	Type of door
z-/01					3		z-/01/s	wall	s	Ext		3	9.00	z-/01/s/g					0	0						
							z-/01/e	wall	e	Ext		0	0.00	z-/01/e/g					0	0						
							z-/01/n	wall	n	Cond																
							z-/01/f	floor	h	Und			0.00													
							z-/01/c	10	h	Ext			0.00													
z0/02							z0/02/n	wall	n	Ext		0	0.00	z0/02/n/g					0	0						
							z0/02/se	wall	se	Ext		0	0.00	z0/02/se/g					0	0						
							z0/02/ne	wall	ne	Cond																
							z0/02/h	floor	h	Und			0.00													
							z0/02/h	flat roof	h	Ext			0.00													
z0/03							z0/03/n	wall	n	Ext		0	0.00	z0/03/n/g					0	0						
							z0/03/w	wall	w	Ext		0	0.00	z0/03/w/g					0	0						
							z0/03/s	wall	s	Cond																
							z0/03/h	floor	h	Und			0.00													
							z0/03/h	flat roof	h	Ext			0.00													
z0/04							z0/04/n	wall	n	Ext		0	0.00	z0/04/n/g					0	0						
							z0/04/s	wall	s	Ext		0	0.00	z0/04/s/g					0	0						
							z0/04/n	wall	n	Cond																
							z0/04/h	floor	h	Und			0.00													
							z0/04/h	flat roof	h	Ext			0.00													

Copy the above format for any further zones; Copy lines in each zone for additional elements.
Zones can be merged prior to entry on survey form (subject to SBEM rules).
Survey Form Version 2.0.....Q1 2019

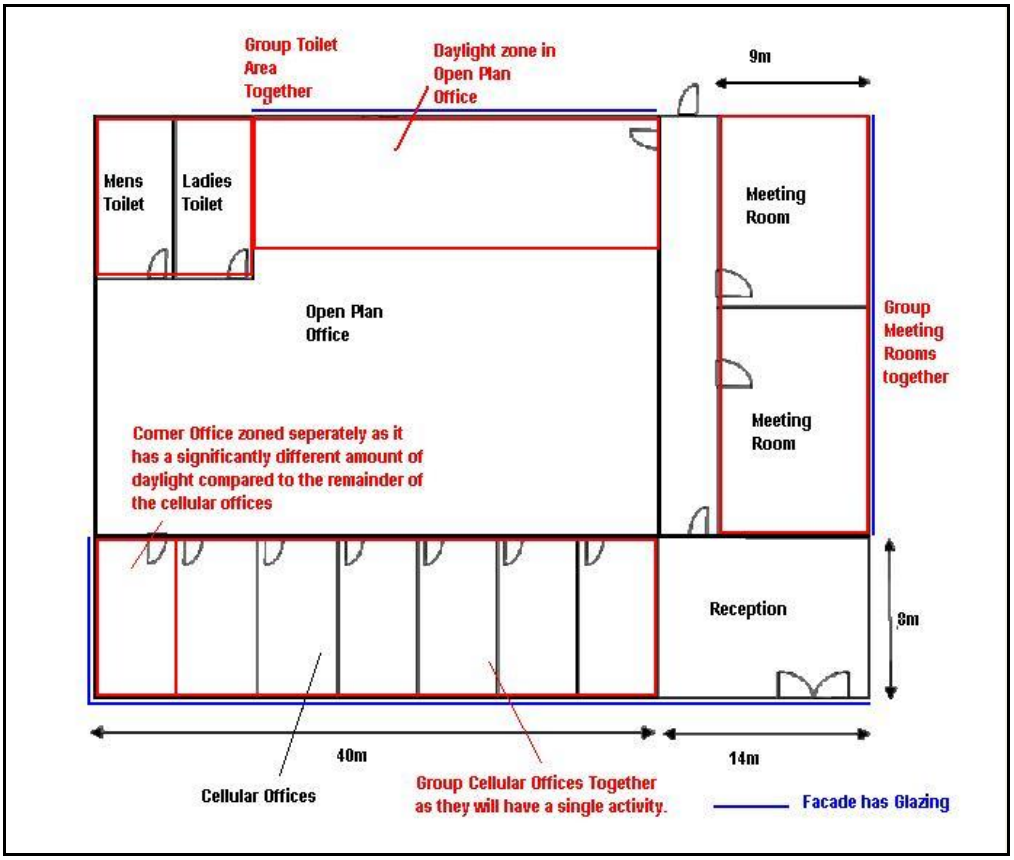
Appendix 2: Zoning Examples

A2.1 Zoning example

Assessors must adhere to the zoning convention as set out in Section 3.3 in How to use iSBEMie (Volume 1) which may help reduce the amount of time and measurement required.
The following is an example office building:



Zoning the building by using the convention set out in How to use iSBEMie (Volume 1) can help reduce the number of measurements that need to be taken. The office building can be zoned as follows:



It is important to note that internal envelopes between merged zones with thermal mass must be included within the model. The κm values determine how the building retains and emits heat, and hence they must be defined in iSBEMie. You can sum the areas of two or more internal walls (between merged zones) with the same construction, adjoining condition and orientation and enter them as one envelope (assigned to the zone resulting from the merging).
If the internal walls are partitions of light construction and very small thermal mass, then they should not cause any significant effects on the calculation.

A2.2 Cold Stores

The process load of a walk-in fridges or freezers should not be included in the iSBEMie analysis.

The zone types in the previous version of the software, cold or chilled stores, are no longer included as an activity types in iSBEMie.

To enter a cold or a chilled store, select activity type "Warehouse storage" or "24x7 Warehouse storage" under the building type "Storage or Distribution".

The "refrigeration aspect" for this space is a process load since it is designed/provided for the goods and not for the thermal comfort of the occupants in the space and is, therefore, outside the scope of the energy uses which can be accessed via iSBEMie. As such, this zone should be defined as a "Zone without HVAC system" in the iSBEMie model.

Furthermore for conditioned spaces which surround this zone, the envelopes which are adjacent to this zone should be defined as adjacent to a "Conditioned adjoining space" so that no heat loss is calculated by the software from the surrounding zones through them since the envelopes of walk-in fridges are usually very well-insulated.

Note spaces which accommodate a considerable number of fridges/ freezers, such as in a supermarket or food hall are modelled in iSBEMie using activities such as "Small Shop Unit Sales area - chilled", "Dept Store Sales area - chilled", or "Retail Warehouse Sales area - chilled" under the building type "Retail and Financial/Professional services".

Appendix 3: List of Activities

Building Types/Activities	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage and Distribution	Hotels	Residential Institutions – Hospitals and Care Homes	Residential Institutions – Residential primary schools	Residential Institutions – Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions – Community/Day Center	Non-residential Institutions – Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions – Primary Health Care Building	Non-residential Institutions – Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others – Passenger Terminals	Others – Emergency services	Others – Miscellaneous 24hr activities	Others – Car Parks 24 hrs	Others – Stand-alone utility block	Non-residential Institutions – Post Primary Education	Non-residential Institutions – Residential Post-primary schools
12hr Specialist Treatment Area							X																	
24hrs Consulting/treatment areas							X																	
24x7 Bedroom Unit							X																	
24x7 Circulation area (corridors and stairways)																				X				
24x7 Generic Office Area					X															X				
24x7 Reception																				X				
24x7 Toilet																				X				
24x7 Warehouse storage					X																			
Assembly areas / halls							X	X																
Auditoria																	X							
Bathroom						X	X	X	X	X									X					
Bedroom								X	X										X					
Bedroom Only						X																		
Bedroom Unit							X																	
Carpark	X		X																		X			

Building Types/Activities	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage and Distribution	Hotels	Residential Institutions – Hospitals and Care Homes	Residential Institutions – Residential primary schools	Residential Institutions – Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions – Community/Day Center	Non-residential Institutions – Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions – Primary Health Care Building	Non-residential Institutions – Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others – Passenger Terminals	Others – Emergency services	Others – Miscellaneous 24hr activities	Others – Car Parks 24 hrs	Others – Stand-alone utility block	Non-residential Institutions – Post Primary Education	Non-residential Institutions – Residential Post-primary schools
Cell (police/prison)										X						X			X					
Changing facilities with showers			X		X	X	X	X	X	X		X		X			X		X			X		
Circulation area (corridors and stairways)			X	X	X	X		X	X	X		X		X	X	X			X		X			
Circulation area (corridors and stairways) – non-public	X	X											X				X	X						
Circulation area (corridors and stairways) – non-public/restricted							X																	
Classroom							X		X	X														
Common circulation areas											X													
Computer lab								X	X					X										
Data Centre																				X				
Dept Store Sales area - chilled	X																							
Dept Store Sales area - electrical	X																							
Dept Store Sales area - general	X																							
Diagnostic Imaging							X																	
Display and public areas													X											
Display window	X																							
Domestic Bathroom											X													
Domestic Bedroom											X													

Building Types/Activities	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage and Distribution	Hotels	Residential Institutions – Hospitals and Care Homes	Residential Institutions – Residential primary schools	Residential Institutions – Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions – Community/Day Center	Non-residential Institutions – Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions – Primary Health Care Building	Non-residential Institutions – Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others – Passenger Terminals	Others – Emergency services	Others – Miscellaneous 24hr activities	Others – Car Parks 24 hrs	Others – Stand-alone utility block	Non-residential Institutions – Post Primary Education	Non-residential Institutions – Residential Post-primary schools
Domestic Circulation											X													
Domestic Dining room											X													
Domestic Kitchen											X													
Domestic Lounge											X													
Domestic Toilet											X													
Dry sports hall						X		X	X	X		X		X			X		X					
Eating/drinking area	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X					
En suite bedroom						X																		
Fitness studio																	X							
Fitness suite/gym			X			X			X	X							X		X					
Food preparation area	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X					
Generic Check-in areas																		X						
Generic Office Area	X	X	X	X	X	X							X			X	X	X	X		X			
Generic Ward							X																	
Hall/lecture theatre/assembly area								X	X	X		X	X	X		X	X							
Heavy Plant Room																				X				
Hydrotherapy pool hall							X																	
Ice rink																	X							

Building Types/Activities	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage and Distribution	Hotels	Residential Institutions – Hospitals and Care Homes	Residential Institutions – Residential primary schools	Residential Institutions – Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions – Community/Day Center	Non-residential Institutions – Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions – Primary Health Care Building	Non-residential Institutions – Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others – Passenger Terminals	Others – Emergency services	Others – Miscellaneous 24hr activities	Others – Car Parks 24 hrs	Others – Stand-alone utility block	Non-residential Institutions – Post Primary Education	Non-residential Institutions – Residential Post-primary schools
Industrial process area				X			X																	
Laboratory				X			X	X	X				X	X										
Laundry	X					X	X	X	X	X							X							
Light Plant Room	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X			
Lounges																		X						
Offices and consulting areas							X	X	X	X		X		X	X									
Operating theatre							X																	
Performance area (stage)		X															X							
Physiotherapy studio							X																	
Post Mortem facility							X																	
Public circulation areas							X										X							
Reception			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X					
Residents common rooms								X	X															
Residents kitchen									X															
Retail Warehouse Sales area - chilled	X																							
Retail Warehouse Sales area - electrical	X																							
Retail Warehouse Sales area - general	X																							
Sales area - general																	X							

Building Types/Activities	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage and Distribution	Hotels	Residential Institutions – Hospitals and Care Homes	Residential Institutions – Residential primary schools	Residential Institutions – Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions – Community/Day Center	Non-residential Institutions – Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions – Primary Health Care Building	Non-residential Institutions – Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others – Passenger Terminals	Others – Emergency services	Others – Miscellaneous 24hr activities	Others – Car Parks 24 hrs	Others – Stand-alone utility block	Non-residential Institutions – Post Primary Education	Non-residential Institutions – Residential Post-primary schools
Server Room																				X				
Small Shop Unit Sales area - chilled	X																							
Small Shop Unit Sales area - electrical	X																							
Small Shop Unit Sales area - general	X																							
Specialist Care Ward							X																	
Store Room	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X					
Swimming Pool						X		X	X					X			X							
Teaching Areas								X						X									X	X
Teaching Areas DoES TGD033 2018								X						X									X	X
Toilet	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X			
Waiting Rooms																		X						
Warehouse storage				X	X																			
Workshop – small scale			X					X	X	X		X	X	X			X							

Appendix 4: Default Data

This section outlines defaults to be used for non-domestic BERs in the absence of evidence supporting non-default data. Actual data must be used where acceptable evidence is available.

A4.1 Project Database

The Age of Building/ Year of Construction is used to identify the appropriate default U-values for construction elements based on the relevant building regulations.

Note on use of defaults:

1) Buildings constructed **prior** to the introduction of Building Regulations in 1991 were not required to have insulation; therefore, the Assessor must demonstrate that insulation is present when selecting "1974 – 1990" options for external elements. "1974 - 1990" assumes a certain amount of insulation is present. If unable to demonstrate that insulation is present in "1974 – 1990"" buildings, "No date – Uninsulated" must be used for external elements from "Help with Inference procedures".

2) Buildings constructed **after** the introduction of Building Regulations in 1991 were required to have insulation, therefore select relevant building regulations for external elements except where the element is known to be uninsulated. In this case, select "No date – Uninsulated" from "Help with Inference procedures".

3) For internal elements (walls, floors or ceilings), irrespective of the adjoining condition, select "No date – Uninsulated" irrespective of the age of the building, unless able to demonstrate that insulation is present. In this case, calculate the U-value by adding the insulation resistance to the default U value for the element without insulation.

4) For glazing, the survey process provides information on window area, glazing type, age, frame type and orientation. Select from "Import one from the library" within iSBEMie software. For the Glazing type assume:

- If unable to determine whether double glazing is Low "E" or not, assume that double glazing installed before 2004 is not Low "E" and during or after 2004 is Low "E".
- Assume that double or triple glazing is air filled unless documentary evidence is provided to substantiate an alternate.
- The gap between double and triple glazing panes must be assumed as 6mm unless measured as otherwise (accounting for pane thickness of 4mm where necessary).

In all cases, the non-default U-values can be calculated using full details where available. For example, for opaque elements thicknesses and thermal properties are known for all the layers and for glazed elements manufacturers declaration forms are available in compliance with relevant standards.

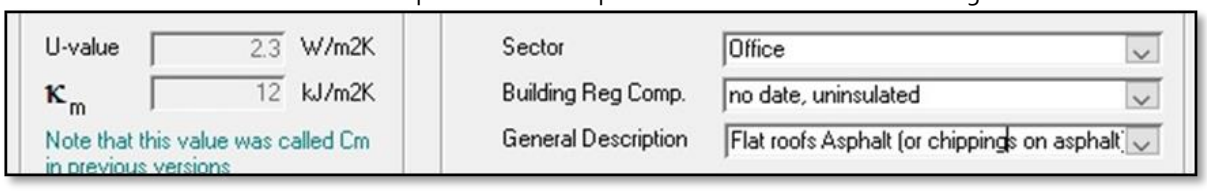
iSBEMie Software Tab: "Project Database "	
Year of Construction	**Relevant Building Regulations and selecting defaults.**
Pre 1994 (external elements)	Opaque Element "No date – Uninsulated" –is selected unless the element is proven to be insulated. 1974 - 1990–where element is proven to be insulated. Glazing: Glazing – As per Note 4 Frame Age – "Pre 1991"

1994 to 1999 (external elements)	Opaque Element: 1991 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 1991 & 1997 Part L
2000 to 2007 (external elements)	Opaque Element: 1997 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 1991 & 1997 Part L
2008 to 2009 (external elements)	Opaque Element: 2006 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2006 & 2008 Part L
Post 2010 to 2018 (external elements)	Opaque Element: 2008 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2006 & 2008 Part L
Post 2019 (external elements)	Opaque Element: 2017 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2017 Part L
Internal Elements	Opaque Element: "No date – Uninsulated" – unless proven to be insulated. Glazing: Not included in Assessment

The following examples demonstrate use of the methodology in determining the construction type for various elements:

Example 1: Roof

The building was constructed in 1975 with a precast concrete flat roof. Following the guidance above the assessor uses the "Help with Inference procedures" to select the following roof:



"No date, uninsulated" is selected because the building was constructed prior to 1994 and there is no evidence of insulation.

Example 2: External Wall

The building was constructed in 2002 with a cavity wall system. Following the guidance above the assessor uses the "Help with Inference procedures" to select the following external wall:

"1997 Regulations (Ireland)" is the relevant building regulation as per the above table. This is selected because the building was constructed post the introduction of building regulations and is therefore assumed to have insulation.

Example 3: Solid Brick Internal Wall

The building was constructed in 2010. The internal walls were constructed of 215mm solid bricks. Following the guidance above the assessor uses the "Help with Inference procedures" to select the following wall:

"No date, uninsulated" is selected as the wall is an internal element. It is assumed that no insulation is present unless the Assessor can demonstrate otherwise.

Example 4: Internal Stud Partition

The building was constructed in 2005. The internal walls were constructed of a stud partition. Following the guidance above the assessor uses the "Help with Inference procedures" to select the following wall:

Note: The default U value for lightweight partition walls in iSBEMie is based on the stud partition wall being uninsulated, where the assessor can demonstrate that insulation is present "no date, insulated" should be selected.

Example 5: Vehicle Access Door

The building was constructed in 2005. Following the guidance above the assessor uses the "Help with Inference procedures" to select the following door:

"1997 Regulations (Ireland)" is the relevant building regulation as per the above table. This is selected because the building was constructed post the introduction of building regulations and is therefore assumed to have insulation.

A4.2 HVAC System Defaults

In some zones, a default HVAC system must be specified. Further Guidance is given in Appendix 7 through the use of flow charts in helping identify the use of default HVAC systems.

Default HVAC systems are applied to zones meeting the following criteria:

- There is no fixed heating installed;
- There are floor and ceiling finishes, lighting, and ventilation as appropriate;
- The Activity Type requires conditioning;
- There is no proposed design available specifying a HVAC system
- Not considered transient or indirectly conditioned spaces.

Section 3.4.3 of How to use iSBEMie (Volume 2)states "If a zone is defined as having no heating or cooling, i.e., assigned to 'Zones without HVAC system', but the activity type selected for the zone is one which typically requires conditioning (according to the Activity Database), a red exclamation mark "**!**"appears next to this parameter as a warning to the user, in case this was done in error."

When assuming a default HVAC system following the guidance above and Appendix 7, use the following table:

iSBEMie Software Tab: "HVAC"	
Data Entry Item	**Default Value**
No evidence of a HVAC present	The default HVAC systems for buildings are as follows: 1. 'Heating only - Electric resistance' - Assumed to be an electric central heating system with warm air distribution. If you do not know the heating method, you should select electric resistance heating as your default. Selected when **no** non-electrical fuels are present. 2. "Heating only - Other systems' - Assumed to be wet radiator system, heat generated by fuel combustion. This is applied where the building also has a fuel source other than electricity installed. 3. 'Heating and mechanical cooling' - Assumed to be constant volume air system with terminal reheat and fixed fresh air. This is the assumed HVAC system in the absence of other information for conditioned spaces. 4. If no HVAC system serves a zone (ie an unconditioned zone in iSBEMie) select "Zone without HVAC system". This is only in the case where it has been justified that a HVAC system is **not** required in the zone in the NEAP assessment. For details Refer to Section 3.4.3 of How to use iSBEMie (Volume 2)

The following table outlines when various default HVAC systems apply following the guidance above:

Default HVAC System	Building Condition	Zone Conditions

Heating only - Electric resistance	No alternate (e.g. gas/oil) fuel present in the building.
	
	Electricity may or may not be connected to the building.
		• Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example:
		Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom
		Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load.
		• While the zone activity requires heating, the zone is also capable of being naturally ventilated and therefore there is no requirement for cooling. The zone also lends itself to meeting CIBSE Guide A and the Building Regulations for naturally ventilated spaces. The CIBSE Guide A Section 1.4.2.5 and Building Regulation requires that in the absence of mechanical cooling or mechanical ventilation. The zone would be expected to achieve adequate natural ventilation following Building Regulation/ CIBSE requirements under the following circumstances:
		  • Internal load is not excessive, and
		  • Space can be naturally ventilated for example:
		  • Zones not deeper than 7m for single side ventilation and 14m for cross ventilation
		  • Sufficient natural ventilation openings e.g. openable windows, doors (approximately 5% of floor area)

Default HVAC System	Building Condition	Zone Conditions
Heating only - Other systems	Alternate fuel present in the building, for example: • Natural Gas pipework connected to building, whether meter evident or not. • Oil Tank Present and connected to building • LPG Tank Present and connected to building • Solid Fuel Store Present appropriate size to heat building.	• Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example: **Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom** Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load. • While the zone activity requires heating, the zone is also capable of being naturally ventilated and therefore there is no requirement for cooling. The zone also lends itself to meeting CIBSE Guide A and the Building Regulations for naturally ventilated spaces. The CIBSE Guide A Section 1.4.2.5 and Building Regulation require that in the absence of mechanical cooling or mechanical ventilation. The zone would be expected to achieve adequate natural ventilation following the Building Regulation/ CIBSE requirements under the following circumstances: • Internal load is not excessive, and • Space can be naturally ventilated for example: • Zones not deeper than 7m for single side ventilation and 14m for cross ventilation • Sufficient natural ventilation openings e.g. openable windows, doors (approximately 5% of floor area)

Default HVAC System	Building Condition	Zone Conditions
Heating and mechanical cooling	Alternate fuel present in the building **and** where cooling is required, for example: • Natural Gas pipework connected to building, whether meter evident or not. • Oil Tank Present and connected to building • LPG Tank Present and connected to building • Solid Fuel Store Present appropriate size to heat building. Where no alternate fuel is present in the building, but it is proven that cooling is required, "Natural Gas" is selected as the heating fuel. Currently electricity is not available as a heating fuel for the default system, "Natural Gas" is selected as it is the heating fuel used in the notional building. Grid supplied electricity is selected for cooling.	• Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example: **Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom** Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load. • Zone also requires cooling and it is not possible to naturally ventilate, for example: **Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom** Does not include unheated transient, indirectly heated spaces or spaces heated by a process load.

Transient zones
Some unheated zones have a transient/ passing occupancy such as toilets. For transient zones, where "Zones without HVAC system" is applicable, it is acceptable for the red exclamation mark"**!**" to appear. There are further details on transient spaces refer to Appendix 7 and 8 of this survey guide.

Indirectly conditioned zones
As outlined in Section 3.5.9 of How to use iSBEMie (Volume 2), zones which are not serviced by a HVAC system, i.e. have no direct supply of heating or cooling, but are likely to be indirectly conditioned by the surrounding areas due to the high level of interaction with those spaces (allowing the heated air to move freely from the directly conditioned spaces to the indirectly conditioned ones or heat to escape through uninsulated envelopes from directly conditioned spaces to unconditioned spaces), they must be considered heated or conditioned (indirectly) by the same HVAC system that supplies the most important surrounding area". Refer to Appendix 8 of this survey guide for further guidance.

Zones with Air Curtains or Inadequate HVAC
Air curtains are usually designed to prevent cold air entering a space rather than to condition a space.

- Where the air curtain is the only source of heating in the zone, if the output of the heater is less than 10 W/m2, the zone is deemed as unconditioned and "Zone without HVAC System" is assigned. If the

output of the heater is greater than 10 w/m2, the zone is deemed to be conditioned and HVAC system is assigned.

- Where the air curtain is one of the sources of heating in the zone, it is entered as a Bivalent system.

Occasionally BER Assessors may encounter the use of local heating, often radiant based, which is designed to heat an occupant within an unconditioned work area. If the output of the heater within the area is less than 10 W/m2, the zone can be deemed as unconditioned and "Zones without HVAC system" is assigned.

A4.3 HWS System

iSBEMie Software Tab: "HWS"	
Data Entry Item	**Default Value**
No evidence of a Hot Water System present	*Where no evidence of Storage/ Secondary Circulation Losses Present:* "Instantaneous Hot Water only" should be selected with a fuel type selected based on fuel supplied to the unit, "Grid Supplied Electricity" should be selected where oil/gas not present. HWS System Storage/ Secondary Circulation Losses: Not present *Where evidence of Storage/ Secondary Circulation Losses Present:* Where a fuel (oil/gas) is supplied to the building, the HWS System: "Dedicated Hot Water Boiler" should be selected with a fuel type based on fuel supplied to unit. Where oil/gas is not supplied to the building, the HWS System: "Stand-alone water heater" should be selected with a fuel type based on "Grid Supplied Electricity" HWS System Storage/ Secondary Circulation Losses: Based on defaults where evidence not available. The Section 3.5.9 of How to use iSBEMie (Volume 2) states that "Depending on the activity and building type selected for the zone, a standard hot water demand is assumed. For example, there is a demand assumed to arise from the occupants of an office for activities such as washing hands and washing up cups. This demand is associated with the office rather than the toilet or tea room."
Evidence of a Hot Water System present but cannot be accessed	The BER Assessor is satisfied that there is a hot water generator serving the building, but it cannot be accessed because it is behind fitted furniture or is in a locked or otherwise inaccessible area. Follow the guidance above for "No evidence of a Hot Water System present"
Hot Water Storage system insulation if not accessible	The insulation thickness is based on the age of the storage unit as below: If the age of the storage unit is unknown, it must be assumed that the storage unit is the same age as the building. CE marked heaters may be assumed to have at least 25mm of factory insulation. Pre 1994: No Insulation 1994 to 1999: 25mm Factory Insulated Post 1999: 35mm Factory Insulated

A4.4 SES System

iSBEMie Software Tab: "SES"	
Data Entry Item	**Default Value**
Evidence of solar collector present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: - panel aperture area 3 m²; - flat panel, glazed; - facing South, pitch 30°; - combined cylinder, solar part one-third of total, or if a combi boiler the cylinder identified is a dedicated solar cylinder. If combined cylinder is accessible, solar storage volume is portion below the coil directly above the solar heated coil.
Gross Area obtained from survey	Aperture Area= Flat Plate Glazed Gross Area x 0.9 Aperture Area= Evacuated Tube Gross Area x 0.72

A4.5 PV System

iSBEMie Software Tab: "PVS"	
Data Entry Item	**Default Value**
Evidence of PV present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: - PV area is roof area for heat loss, times percent of roof area covered by PVs, and if pitched roof divided by cos (35°) ; - Type: Amorphous silicon; - facing South, pitch 30°. - Unventilated modules

A4.6 Wind Turbine

iSBEMie Software Tab: "Wind generators"	
Data Entry Item	**Default Value**
Evidence of Wind Turbine present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: - Height: Estimate relative to height of building; - Diameter of turbine: Estimate relative to height of turbine; - Terrain Type: Urban with average building height > 15m.

A4.7 Shell and Core Buildings

For shell and core buildings not all of the services are installed (especially lighting, mechanical ventilation and cooling) at the point where the building is sold or let. Buildings (or parts of) that have not previously been sold or occupied and are let or sold as bare structures, without services at all, will nonetheless require a BER

A "Shell and Core" building or zone would typically be where only the bare structure is in place, internal fittings such as flooring and ceiling finishes, lighting, heating, cooling or ventilation have yet to be installed. For example, a retail unit to be fitted out at a later date by a tenant.

As the building (or part of) is being sold or let without being fully completed, the BER will be New Build – Provisional. For Shell and Core Buildings, the requirement for demonstrating compliance with the building regulations will be based on the following:

- MPEPC/ MPCPC and RER will be met based on Building Fabric as built, fixed services as installed and design intent for services yet to be installed.

- Once a part of the building has been leased/ sold and fitted out for the first time, a final BER will need to be published for that part of the building. The building must continue to show compliance through an average of the EPC/ CPC and RER for the building

For example;

Landlord	Tenant 1
	Tenant 1
	Tenant 2
	Tenant 2
	Tenant 3

A new building has 5 floors, the landlord area has been fitted out with services, while each of the tenant areas are being sold/ leased as a shell.

Compliance is demonstrated by the fixed services in the Landlord Area and the design intent for the 5 tenant areas. The developer plans to lease the tenant areas to 3 tenants.

Tenant 1 acquires floors 4 and 5, once these have been fitted out a final BER must be published for the area leased by Tenant 1. Compliance is demonstrated by taking the average the EPC/CPC and RER for the building.

The landlord area EPC_L, CPC_L and RER_L is based on Final BER certificate for the Landlord Area

Tenant 1 area EPC_1, CPC_1 and RER_1 is based on Final BER certificate for Tenant 1.

Tenant 2 and 3, have not yet been fitted out so the $EPC_{2 \text{ and } 3}$, $CPC_{2 \text{ and } 3}$ and $RER_{2 \text{ and } 3}$ are based on the design intent and Provisional BERs.

The BER of a Shell and Core building is based on the following:

Data Entry Item	Default Value
Proposed Design Available	Where a proposed mechanical and electrical design is available, the HVAC and lighting system are based on the mechanical and electrical specifications, schedules and drawings for the shell and core unit. For compliance with the 2017 Building Regulations Part L for Building other than Dwellings, as outlined in section 0.1.1.6 of the technical guidance document, the design and specification should be compatible with the intended building end use and servicing strategy. The renewable requirement of the shell and core building should be installed at an early stage in the construction process to ensure that the building will meet the renewables provision for the whole building when completed. The renewable installation should be based on the RER requirement to achieve Part L 2017 compliance and where full building service installation is not provided until tenant fit-out stage, the RER is calculated based on the intended use/ uses of the building and the proposed mechanical and electrical design for the building as a whole.

No Design Available	HVAC System: Select default system "Heating and Mechanical Cooling" which is based on Terminal reheat (constant volume) and air-cooled chiller. For heating the fuel type should be as available on site, where no alternate fuel is present in the building, "Natural Gas" is selected as the heating fuel. Currently electricity is not available as a heating fuel for the default system, "Natural Gas" is selected as it is the heating fuel used in the notional building. A HVAC system is assigned to every zone where the activity type selected for the zone is one which typically requires conditioning (according to the Activity Database), and a red exclamation mark "**!**"appears. HWS System: "Instantaneous Hot Water only" is selected with a fuel type as available on site, where no alternate fuel is present "Grid Supplied Electricity" should be selected. HWS System Storage/ Secondary Circulation Losses: Not present. Lighting: Lighting Parameters Not Available; Lamp Type: Tungsten. Lighting Controls: Local Manual Switching. Shell and Core Buildings cannot demonstrate compliance with 2017 Building Regulations without specification of intended servicing strategy.

As per the Code of Practice, BER Assessors are required to carry out a full building survey where an Existing or New Final BER certificate is being published or where a Provisional Certificate is being produced for a Shell and Core building which is being built. In the case of Shell and Core buildings this may be just verifying that no services are installed along with collecting other data such as dimensions.

If there is any material change to the data in the BER assessment such as fabric, services for heating, hot water, mechanical ventilation or air conditioning, the original BER certificate is no longer valid. This applies to all buildings – not just shell and core buildings.

Zone Activity
The Assessor should select the most appropriate activity type for the building.

A4.8 Default exhaust rates

When exhaust fans are encountered in existing buildings a BER Assessor will often have no information on the installed flow rate of the extract system. Where fan data plates can be read the information can be used to enter a non-default value. In the absence of such information the following table lists some default exhaust flow rates to be used.

Description	iSBEMie activity	Assumed extract rate
Small kitchen or kitchenette or tea making facility with a single extractor fan only. Very limited food preparation activities taking place. (When entering as part of single zone with office space, divide ACH by volume of Tea Making and multiply by volume of zone)	Generic Office (was Tea Making)	10 ACH
Domestic' type kitchen with a single cooker hood extraction unit and limited food preparation activities	Food preparation	15 ACH
Commercial kitchen with multiple cooker hood extraction. Extensive food preparation activities, e.g. kitchen serving restaurant	Food preparation	40 ACH
Toilet	Toilet	6 litres /second per WC/Urinal

Shower/ Bath	Shower/ Bath	15 litres /second per shower/ bath

To convert Air Changes per Hour (ACH) to l/s/m2 for entry to iSBEMie:
If Room height = 3.2 m, Extract fan 10ACH
3.2m x 10ACH / 3.6 = 3.67 l/s/m2

A4.9 Display Lighting

iSBEMie Software Tab: "Zones / Display Lighting"	
Data Entry Item	**Default Value**
Zones incorporate an activity whereby iSBEMie automatically assumes the presence of display lighting.	Where zones incorporate an activity whereby iSBEMie automatically assumes the presence of display lighting, but none is actually present or where the display lighting uses efficient lamps, the display lighting parameter should to be adjusted. Where there is no display lighting, the efficiency for iSBEMie is entered based on the general lighting present in that zone. Where possible this should be calculated, but as this requires detailed measurements of the lumen (lm) and circuit watt (cW) this is not usually practical in existing buildings. The following 'default' values are used in the absence of more detailed information: 1. Where the general lighting is not using Tungsten or Tungsten Halogen lamps, enter that the display lighting uses efficient lamps and enter the lamps luminous efficacy based on Table 12 of How to use iSBEMie (Volume 2). If there is more than one type, the lowest applicable value from Table 12 should be used. 2. When the general lighting uses Tungsten or Tungsten Halogen lamps; enter that the display lighting **does not** use efficient lamps. In this case, a "Lumens per circuit wattage" entry is not required. For the purposes of the lighting calculations in iSBEMie, efficient display lighting is one with a lamp and ballast efficacy better than 15 lamp-lumens per circuit-Watt. Where details of Display Lighting are available, the performance in iSBEMie should be updated to reflect performance. Examples of efficient display lighting lamps include: metal halide, compact fluorescent, and white SON (high pressure sodium).

For Example
A supermarket has T5 Fluorescent - triphosphor-coated - high frequency ballast lighting generally but has a combination of metal halide and compact fluorescent lighting display lights. No further information is available. The zone lighting could be chosen as "T5 Fluorescent - triphosphor-coated - high frequency ballast" and display lighting changed to "Energy efficient lamps". From Table 12, metal halide lamps have an efficacy of 25 for side-lit zones, whilst compact fluorescent lamps have an efficacy of 22.5 luminaire lumens per circuit Watt. Therefore 22.5 is entered as the display lighting lamp lumen efficacy.

A4.10 Non-Default κ_m Value

A non-default κm value (kJ/m²K) is based on the makeup of the construction. As outlined in Section 3.3.1 of How to use iSBEMie (Volume 2), the κm value is calculated as follows:

κm value = density (kg/m3) x thickness (m) x specific heat capacity (kJ/(kgK))

Starting from the layer of the construction closest to the space (interior), add the values together until any one of the following conditions is satisfied:

- The sum of the layer thicknesses has reached 0.1m,
- You have reached the mid-point of the construction or
- You have reached an insulating layer (has a conductivity of 0.08 W/mK or less)

Details of the density for common building materials can be obtained from Building Regulation TGD L – Buildings Other Than Dwellings (Table A1) or from CIBSE Guide A.

Details of specific heat capacity for common building materials can be obtained from CIBSE Guide A or from the table below:

Material	Specific Heat Capacity (J/(kgK))
Clay Brickwork	1000
Concrete Block	1000
Cast Concrete	1000
Aerated Concrete Slab	1000
Concrete Screed	1000
Reinforced Concrete	1000
Mortar	920
External Render	1000
Plaster/ Plasterboard	1000
Natural Slate	840
Clay Tiles	840
Asphalt	920
Felt Bitumen layers	1700
Wood	1700

The following shows an example of how to calculate the κm value for an external wall:

The wall consists of the following construction layers:

Layer (Inner to Outside)	d (mm)	Conductivity (W/mK)	Density (kg/m³)	Specific Heat Capacity (J/(kgK))
Plasterboard	13	0.18	600	1000
Concrete block (dense)	100	1.130	2000	1000
insulation	75	0.040	20	1450
Air Gap	50			
Brick outer leaf	105	0.770	1700	1000

As outlined in Section 3.3.1 of How to use iSBEMie (Volume 2), the κm value is calculated until the sum of layers equals 0.1m or an insulating layer is met, in this case the κm value is as follows:

600kg/m³ x 0.013m x (1000J/kgK/ 1000J/kJ) =	7.8 kJ/m²K
2000kg/m³ x (0.1 – 0.013[†])m x (1000J/kgK/1000J/kJ) =	174 kJ/m²K
κm value	181.8 kJ/m²K

[†] The 0.1m thickness is reached

Appendix 5: Sessional Efficiency of Heating, Cooling and Ventilation Systems

Assessors must calculate the seasonal efficiency for various heating and cooling systems in buildings. This appendix outlines the details of how the seasonal efficiency is calculated for various systems.

A5.1 Boilers

A single boiler's seasonal efficiency is based on the gross efficiency calculated at 100% load and 30% load. Under the Ecodesign Directive 813/ 2013, manufacturers are required to publish the efficiency at both loads. The seasonal efficiency is calculated as follows:

Boiler seasonal efficiency = $0.81\ \eta_{30\%} + 0.19\ \eta_{100\%}$

Where;

$\eta_{30\%}$ is the gross boiler efficiency measured at 30% load

$\eta_{100\%}$ is the gross boiler efficiency measured at 100% load

For boilers with an output > 400 kW, the manufacturer's declared efficiency should be used.

In the case of multiple boiler systems, the seasonal efficiency is calculated using the weighted average of efficiencies for 3 load conditions:

Multiple Boiler seasonal efficiency = $0.36\ \eta_{15\%} + 0.81\ \eta_{30\%} + 0.19\ \eta_{100\%}$

Where;

$N_{15\%}$ is the gross boiler efficiency measured at 15% load

The following examples demonstrate use of the Compliance Guide in determining seasonal heating efficiency (boilers)

Example 1: Building with a Condensing Gas Boiler and Standard Gas Boiler.

Information from Building Survey:

Heating Load: 200kW

	Boiler 1	Boiler 2
kW Rating	150kW	150kW
Fuel Type	Gas	Gas
Stage	Lead	Lag
Boiler Efficiency based on Gross Calorific Value from accredited data	90% at 100% load 96% at 30% load	82% at 100% load 86% at 30% load

Using the following table, the seasonal efficiency is calculated as follows:

		Boiler % efficiency at boiler outputs of		Boiler % output at system outputs of			Boiler % efficiency at system outputs of		
Boiler No	Rating kW	100%	30%	15%	30%	100%	15%	30%	100%
1									
2									
3									
System efficiency at part load									
Weighting factor							0.36	0.45	0.19

Overall seasonal boiler efficiency	

		Boiler % efficiency at boiler outputs of		Boiler % output at system outputs of			Boiler % efficiency at system outputs of		
Boiler No	Rating kW	100%	30%	15%	30%	100%	15%	30%	100%
1	150	90	96	20%[1]	40%	100%	96.9[3]	95.1	90
2	150	82	86	Not Firing	Not Firing	33%[2]	Not Firing	Not Firing	85.8
3									
System efficiency at part load							96.9	95.1	89.1[4]
Weighting factor							0.36	0.45	0.19
Overall seasonal boiler efficiency							94.6[5]		

Notes:

1. Calculated based on the following: $\frac{15\% \times \text{Heating Load (200kW)}}{\text{Boiler 1 Load (150kW)}} = 20\%$

2. Calculated based on the following: $\frac{\text{Heating Load (200kW)} - \text{Boiler 1 Load (150kW)}}{\text{Boiler 2 Load (150kW)}} = 33\%$

3. Calculated by the linear interpolation $\eta_{b,p} = \underline{\eta}_{30\%} - (\eta_{30\%} - \eta_{100\%}) * (q_{b,p} - 30\%)/ (100\% - 30\%)$

   $\underline{\eta}_{20\%} = 96 - (96 - 90) * (20\% - 30\%)/(100\% - 30\%)$

   $\underline{\eta}_{20\%} = 96.9$

4. Calculated by dividing the thermal output of the system by the rate of fuel combustion, which is given by the sum of the boiler outputs divided by their individual operating efficiency.

   $\underline{\eta}_{100\%}$ = 200/ ((150*100%/90) + (150*33%/85.8))

   = 89.1%

5. Calculated as the weighted average;

   = 0.36* 96.9 + 0.45 * 95.1 + 0.19 * 89.1

   = 94.6%

   Convert to a decimal for entry in to iSBEMie. i.e. 0.946

Credits for controls can be applied to the seasonal efficiency to account for controls not included within the test results or where default values are used. A maximum of 4 percentage points can be claimed. Note that the efficiency calculated under the Ecodesign and Energy Labelling Directive and shown in manufacturers literature already accounts for heating efficiency credits for temperature controls.

Table: Heating efficiency credits

Measure	**Heating Efficiency Credits**	**Comments**
Boiler oversize <= 20%	2	
Multiple Boilers	1	
Sequential control of multiple boilers	1	

TRV / Temperature Zone Control	1	Evidence required that not included in Test Data
Weather Compensation	1.5	Evidence required that not included in Test Data
Room Thermostat	0.5	Evidence required that not included in Test Data
Optimum Start	1.5	Evidence required that not included in Test Data
Optimum Stop	0.5	Evidence required that not included in Test Data
Optimum Start/ Stop	2	Evidence required that not included in Test Data
Full Zoned Time Control	1	Evidence required that not included in Test Data
Full building management system	4	Evidence required that not included in Test Data
Decentralised heating system	1	

Example 2: Gas Boiler and Controls.

Information from Building Survey:

Heating Load: 200kW

	Boiler 1
kW Rating	300kW
Fuel Type	Gas
Stage	Lead
Seasonal Boiler Efficiency based on Gross Calorific Value	82%
Temperature Controls	TRVs on all radiators
	Optimised Start/Stop

Using Table above the seasonal efficiency is calculated as follows:

	Heating Efficiency Credits
Boiler Efficiency	82%
System uses TRVs to ensure full building temperature control	1
System uses Optimised Start/Stop to achieve specified conditions during occupancy period	2
Total Credits	**3**

Effective boiler seasonal efficiency:

= Boiler Efficiency + maximum of 4 heating efficiency credits

= 82% + 3%

= **85%**

A5.2 Heat Pump Guidance

The Heat Pump Methodology for Non-Domestic Buildings is currently under development.

The following guidance must be followed for demonstrating compliance until such time as the methodology is published.

For Space Heating:

Where a heat pump make/ model is compliant with the Ecodesign and Energy Labelling Directive or has EN 14825 accredited test data, the "Seasonal Space Heating Efficiency" is taken for High Temperature (55°C).

The "Seasonal Space Heating Efficiency" taken directly from the Ecodesign declaration (%) is converted by multiplying by 2.5 and divided by 100 for entry into iSBEMie. For example, a Heat Pump with "Seasonal Space Heating Efficiency" of 120% is converted and entered into iSBEMie as follows: 120 x 2.5 / 100 = 3.

Note: The factor of 2.5 is based on Ecidesign declared efficiency being based on primary energy of electricity using an EU wide standard primary energy factor of 2.5.

Where an assessor wishes to use the "Seasonal Space Heating Efficiency" at Low Temperature (350C), they must provide sufficient documentary evidence from the designer to demonstrate design flow temperature.

Where there is insufficient documentary evidence available to support the Seasonal Space Heating Efficiency a default value must be used.

For Hot Water:

Where a Heat Pump is used for water heating, the assessor must select "Heat Pump" as the generator type and cannot select "Same as HVAC" irrespective of the presence or not of a heat pump in the HVAC system.

Where a heat pump make/model is compliant with the Ecodesign and Energy Labeling Directive or has EN16147 test data, the "Water Heating Energy Efficiency" is taken. As with the Space Heating this needs to be converted for entry into iSBEMie.

Where there is insufficient documentary evidence available to support the Water Heating Energy Efficiency a default value must be used.

A5.3 Cooling Seasonal Efficiency

The seasonal efficiency is based on the part load energy efficiency ratios EER measured at 100%, 75%,50% and 25% operating conditions. Under the Ecodesign Directive, manufacturers are required to publish the part load EERs. The seasonal efficiency is calculated as follows:

$SEER = a(EER_{100\%}) + b(EER_{75\%}) + c(EER_{50\%}) + d(EER_{25\%})$

Where;

$EER_{x\%}$ is the part load energy efficiency ratio at 100%, 75%, 50% and 25% operating conditions.

a, b, c and d are the load profile weightings.

Sample load profiles:

	a	b	c	d
Unknown load profile	0.25	0.25	0.25	0.25
Office load profile	0.03	0.33	0.41	0.23

A5.4 Specific Fan Power

The Specific Fan Power is calculated in accordance with IS EN 13779:2007 Annex D "Calculation and application of specific fan power. Calculating the SFP, SFP_E, SFP_V".

$$SFP = \frac{P_{sf} + P_{ef}}{q}$$

Where

- SFP is the specific fan power demand of the air distribution system (W/l/s)
- P_{sf} is the total fan power of all supply air fans at the design air flow rate, including power losses through switchgear and controls associated with powering and controlling the fans (W)
- P_{ef} is the total fan power of all exhaust air fans at the design air flow rate including air flow losses through the switchgear and controls associated with powering and controlling the fans (W)
- q is the design air flow rate through the system, which should be the greater of either the supply or exhaust air flow (l/s). Note that for an air handling unit, q is the largest supply or extract air flow through the unit.

Note the following Specific Fan Powers should not be used:

- SFP_E as this accounts for an adjustment for partial load conditions
- SFP_v as this accounts for the validation load conditions rather than the design conditions
- SFP_{int} as this is the internal specific fan power of the ventilation component determined from a reference configuration.

Appendix 6: Determining Zone Heights and U-Values

<table>
<tr><th colspan="2">Zone Height and Element Areas</th></tr>
<tr><td>

- For ground and intermediate floors, the zone height is from top of floor slab to top of floor slab.
- For top floor the zone height is from top of floor slab to soffit/ underside of roof slab
- For the purpose of zone height and surrounding wall areas, suspended ceilings and raised floors are ignored.

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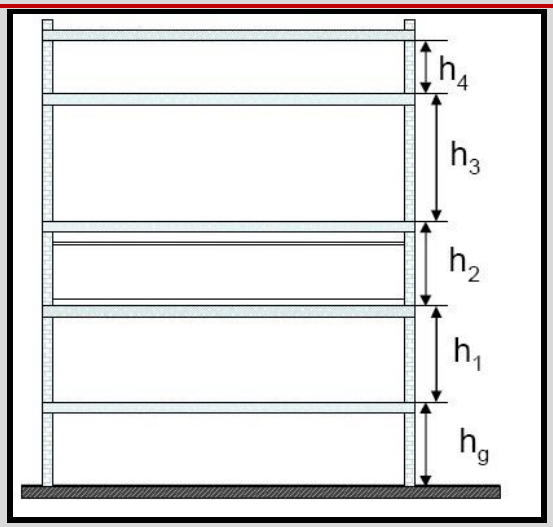

Example 6.1

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<tr><td>

For top floors with pitched roof but flat ceiling:

- Zone height is top of floor to underside of soffit/eaves level - h_4
- Area of gable wall is that below soffit/eaves level i.e. $L_4 \times h_4$
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof including insulation irrespective of its location in the roof.

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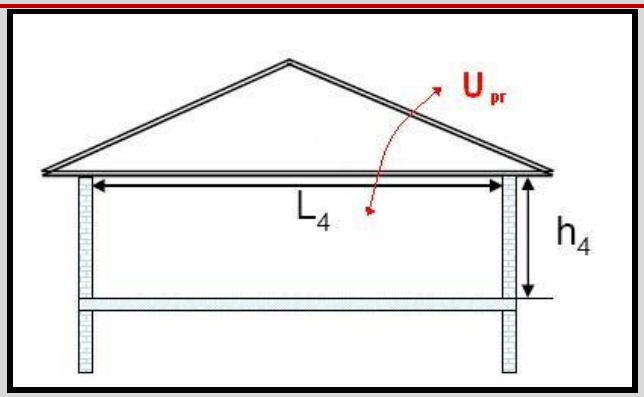

Example 6.2

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For top floors with pitched roof and dropped ceiling (with or without insulation at ceiling level):

- Zone height is top of floor to underside of soffit/eaves level - h_4
- Area of gable wall is that below soffit/eaves level i.e. $L_4 \times h_4$
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof including insulation irrespective of its location in the roof.

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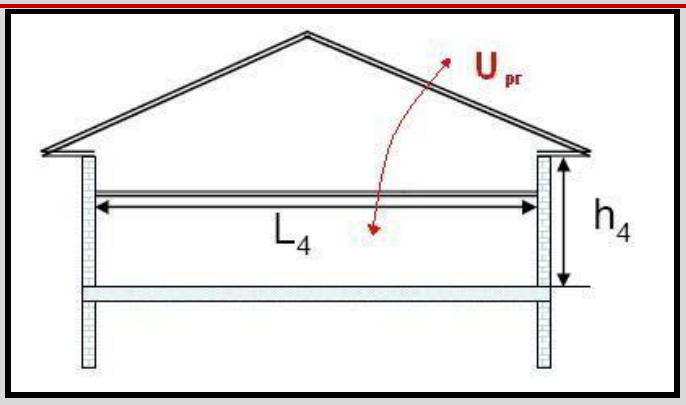

Example 6.3

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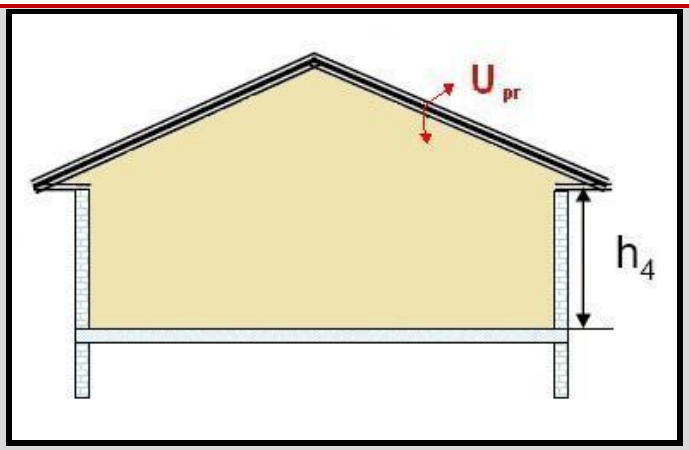
</table>

For top floors with pitched ceiling:

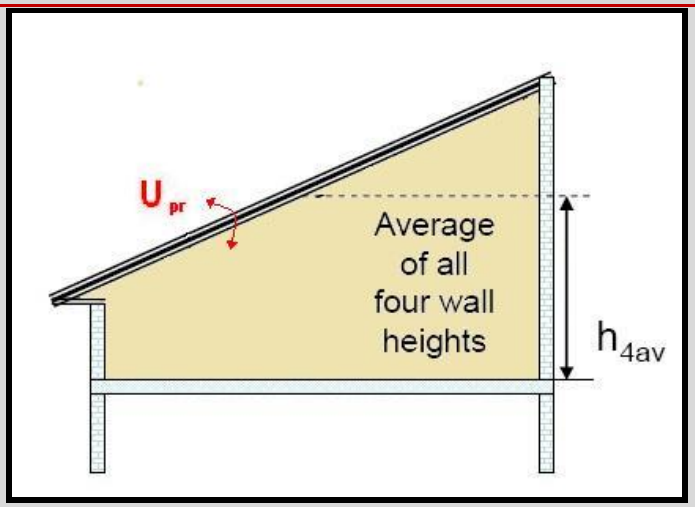
- Zone height is top of floor to underside of soffit/eaves level - h_4 (not average room height)
- Area of gable wall is whole wall up to roof apex (shaded area)
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof.



Example 6.4

For top floors with mono-pitched ceiling:

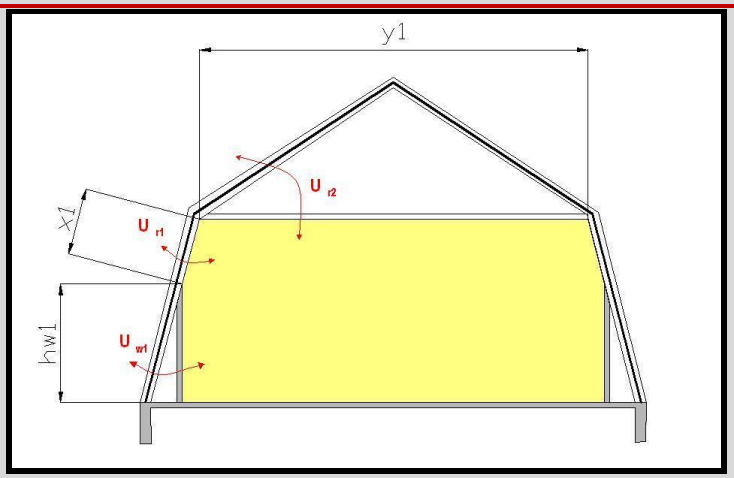
- Zone height is top of floor to weighted average height of all walls - h4av
- Area of gable wall is whole wall (shaded area)
- Note that zoning for daylit areas must be carried out manually in these circumstances.
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof.



Example 6.5

For Room in Roof or Mansard Roof:

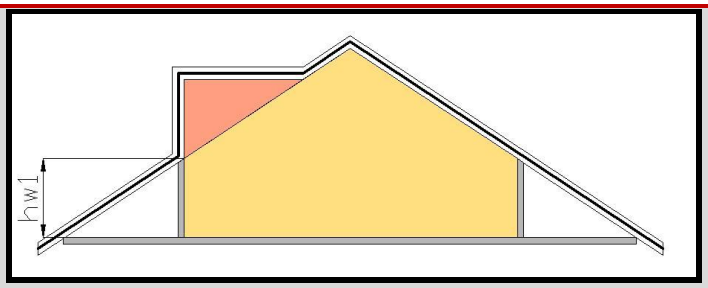
- Zone height (hw1) = height of vertical part of wall.
  If hw1 varies around the zone, calculate the area weighted average height.
- The U-value (Uw1) through the external walls should include any voids as appropriate.
- The U-value (Ur1) through the first roof construction X1 is roof structure only.
- The U-value (Ur2) through the second roof construction Y1 is from underside of ceiling to outside roof including insulation as appropriate and void.



Example 6.6

For Room in Roof with Dormer Window

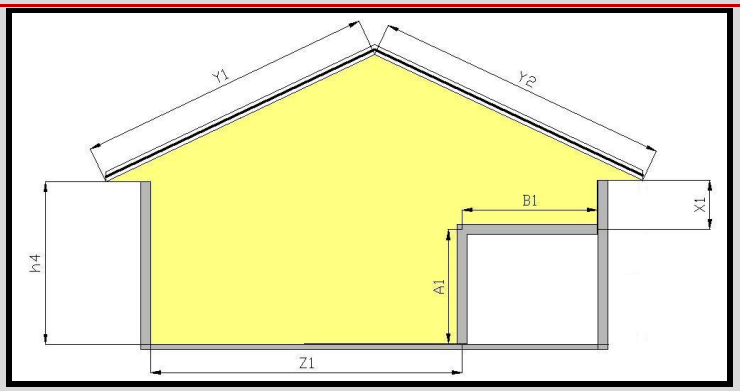
- As per Room in Roof above.
- Zone height (hw1) = height of vertical part of wall.
  If hw1 varies around the zone, calculate the area weighted average height.
- Do not adjust zone height for dormer window
- The external elements, wall, roof and glazing of the dormer window should be included as normal.
- Zone manually for daylight areas (if glazing >20% of vertical wall area)



Example 6.7

For Warehouse with unusable space above adjoining zone:

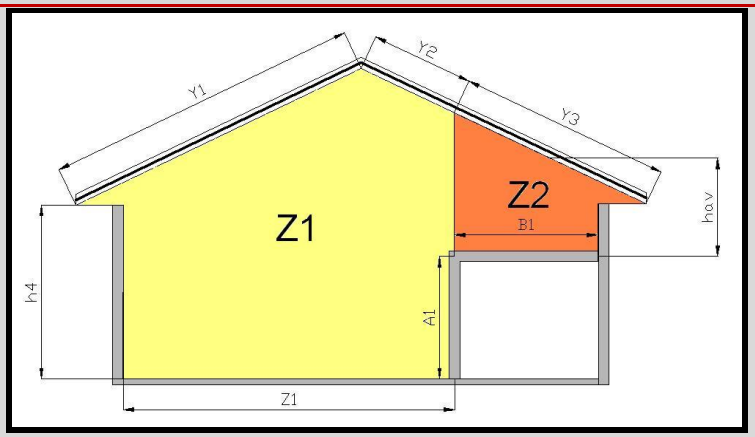
- Zone height is top of floor to underside of soffit/eaves level - h4
- Area of gable wall is whole wall up to roof apex (shaded area)
- Area of roof is (Y1 + Y2) x length of the zone
- Height of side walls shown as X 1 and h4
- Area of ground floor and area of zone is Z1 x length of the zone
- The internal elements shown as A1 and B1 should be added as appropriate.



Example 6.8

For Warehouse with usable space above adjoining zone, the warehouse is split into two zones:

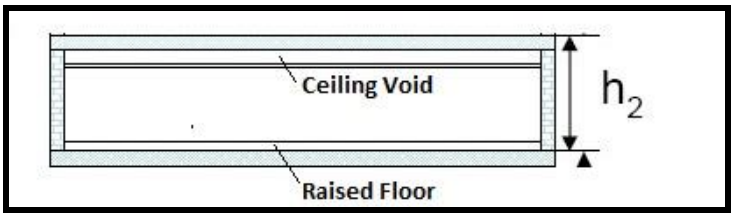
- Zone height for Z1 is top of floor to underside of soffit/eaves level - h4
- Zone height for Z2 is weighted average height of all walls - hav as per the monopitched ceiling guidelines.
- Area of gable wall for Z1 is whole wall up to roof apex (shaded area in yellow)
- Area of gable wall for Z2 is whole wall up to roof apex (shaded area in orange)
- Area of roof in Z1 is (Y1 + Y2) x length of the zone
- Area of roof in Z2 is (Y3) x length of the zone



Example 6.9

Slab Thickness
When there is insufficient proof of the actual slab thickness (not detailed in drawings for example), a default of 250mm is used.

Ensure that where ceiling voids and raised floors exist that these are correctly identified. The depth of the ceiling voids and raised floors is included in the overall height of the zone. Check that documentary evidence is maintained to support entry.

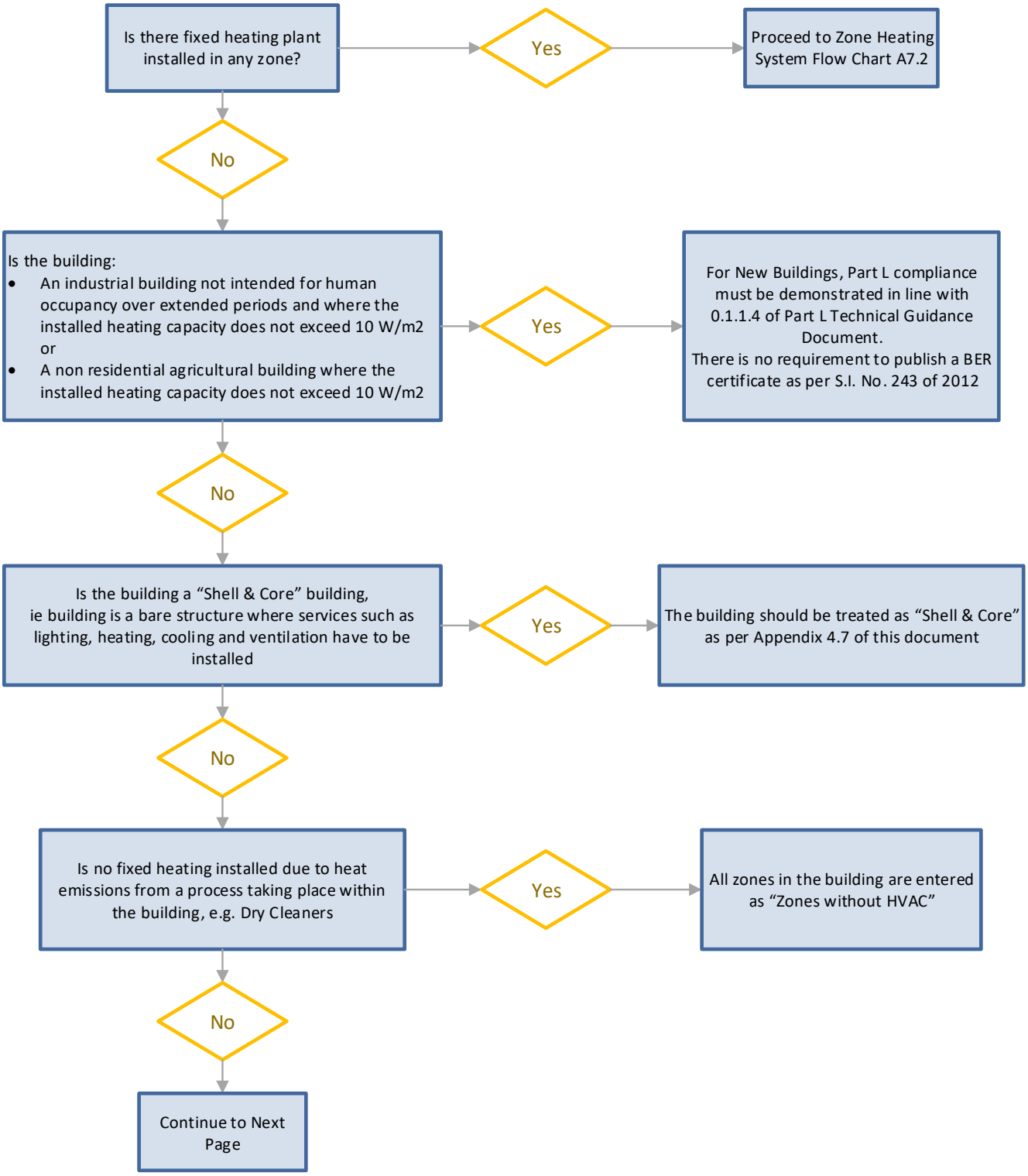


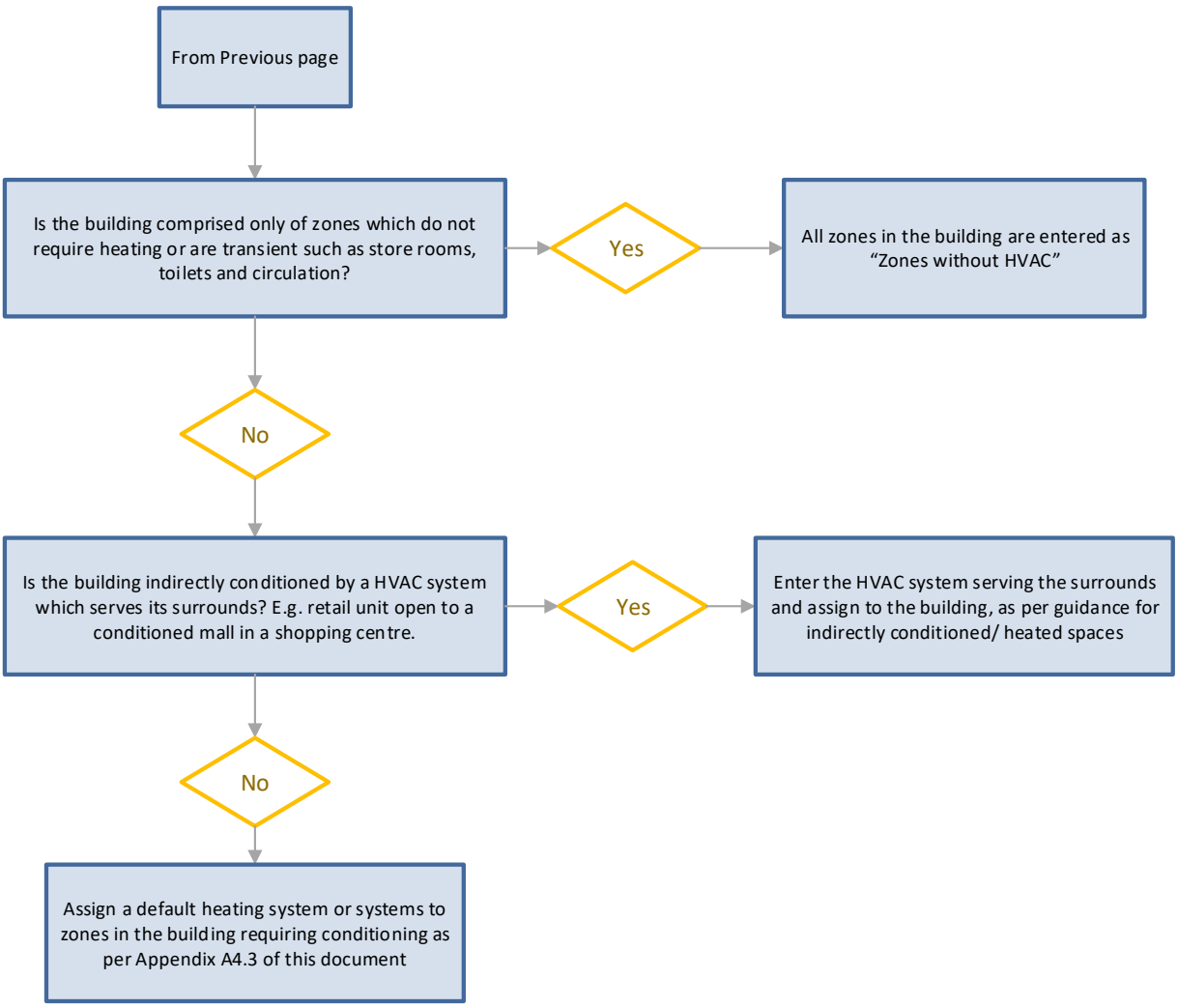
Example 6.10

Global Zone Height
A global zone height can be set in iSBEMie under General and Geometry -> Building Details. The value entered is given as the global or default zone height in each of the zones. The zone height can be altered or use the global height for respective zones. Where a zone height differs from the global/default height, select the global button  and enter the actual zone height.

Appendix 7: Identifying the Heating System

A7.1 Building Heating System Flow Chart




From Previous page
Is the building comprised only of zones which do not require heating or are transient such as store rooms, toilets and circulation?
Yes
All zones in the building are entered as "Zones without HVAC"
No
Is the building indirectly conditioned by a HVAC system which serves its surrounds? E.g. retail unit open to a conditioned mall in a shopping centre.
Yes
Enter the HVAC system serving the surrounds and assign to the building, as per guidance for indirectly conditioned/ heated spaces
No
Assign a default heating system or systems to zones in the building requiring conditioning as per Appendix A4.3 of this document

A7.2 Zone Heating System Selection Flow Chart

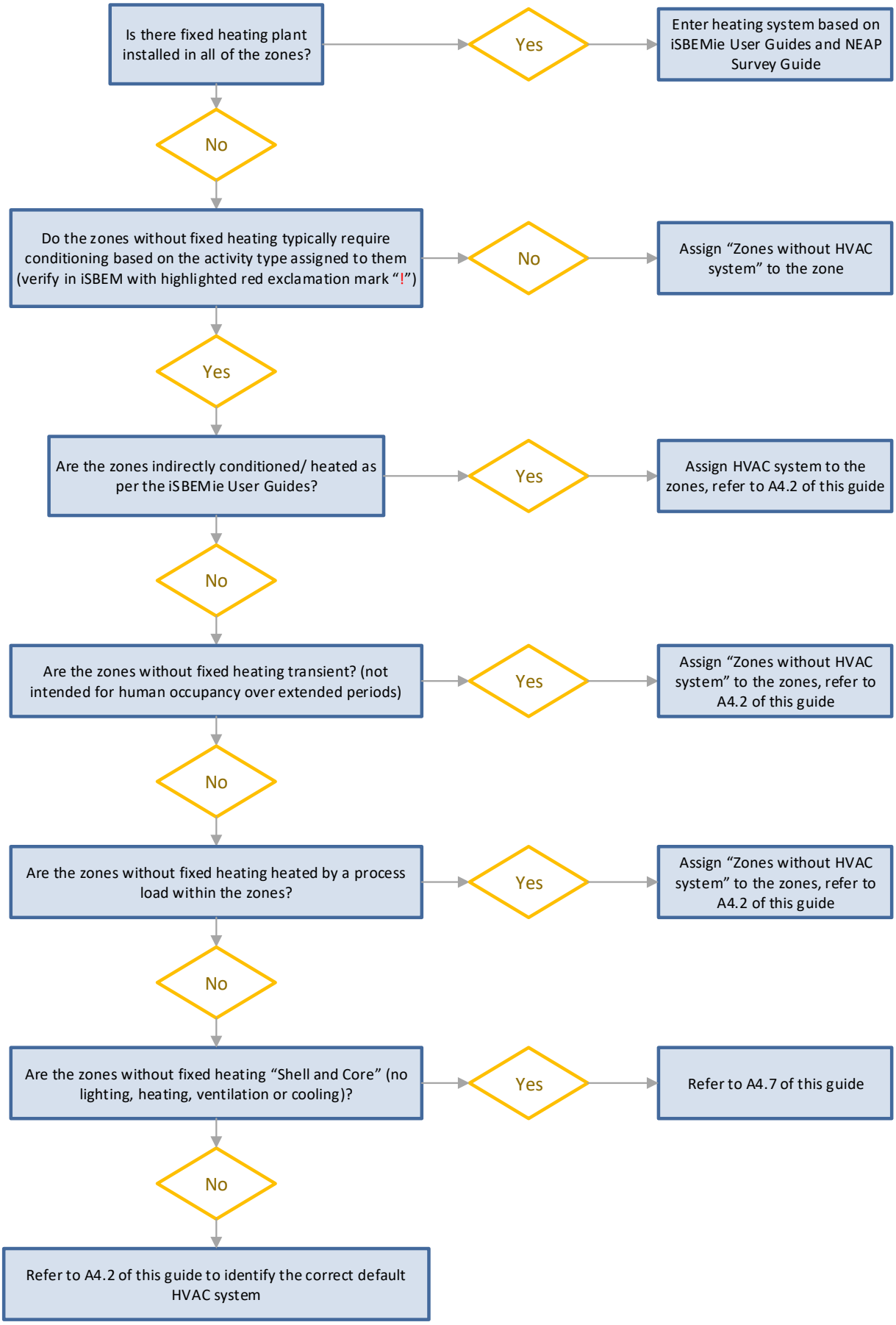


Table A7 Examples of Unheated Zones
The following outlines examples of unheated zones:

Unheated Parameters	Some Unheated Zone Types to which the parameters may apply
The zone does not have fixed heating and typically does **not** require conditioning based on the activity type (no red exclamation mark "!" shown in iSBEMie) "Zones without HVAC system" is assigned to the zone.	• Storage Area • Circulation Areas • Storage – chilled • Plantroom • Warehouse Storage
The zone does not contain fixed heating and is indirectly conditioned HVAC system of the adjoining heated zones is assigned to the zone. See Section A4.2 and Appendix 8 of this document and Section 3.5.9 of How to use iSBEMie (Volume 2)	• Circulation Areas • Storage Area • Toilets
The zone does not contain fixed heating and is a transient space (not intended for human occupancy over extended periods)? "Zones without HVAC system" is assigned to the zone. See Survey Guide Section A4.2.	• Toilet • Changing Facilities • Corridor
The zone does not contain fixed heating and is heated by a process load within the zone? "Zones without HVAC system" is assigned to the zone. See Survey Guide Section A4.2.	• Industrial process area • IT Equipment • Data Centre • Laundry • Food Preparation
The zone does not have fixed heating and is a "Shell and Core" (no lighting, heating, ventilation and cooling) HVAC system assigned to the zone as per NEAP Survey Guide A4.7	• Generic Office • Retail • Industrial
The zone does not have fixed heating, typically requires conditioning based on the activity type (red exclamation mark "!" shown in iSBEMie) and does not meet conditions above. Default HVAC system assigned to the zone as per NEAP Survey Guide A4.2	• Generic Office • Classroom • Hall / Lecture Theatre/ Assembly Area • Laboratory • Consulting Room

Where fixed space heating is present in the zone, the HVAC system is entered based on the iSBEMie User Guide and NEAP Survey Guide.

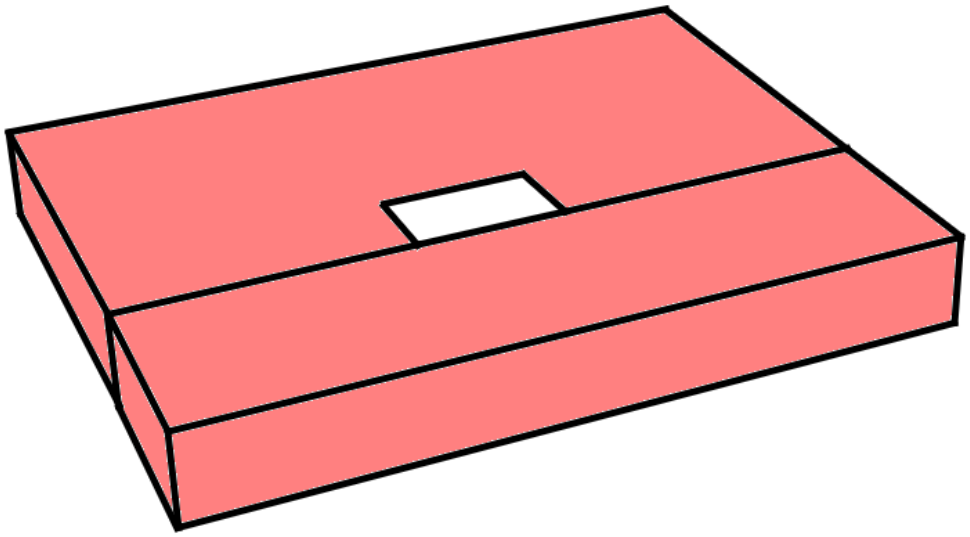
Appendix 8: Assigning Adjacent conditions

Heat losses through building elements, must be correctly accounted for in the BER assessment.

The following shows a series of examples demonstrating how the adjacent condition is assigned.
The white zones have no fixed HVAC installed, while the red zones have fixed serves installed.

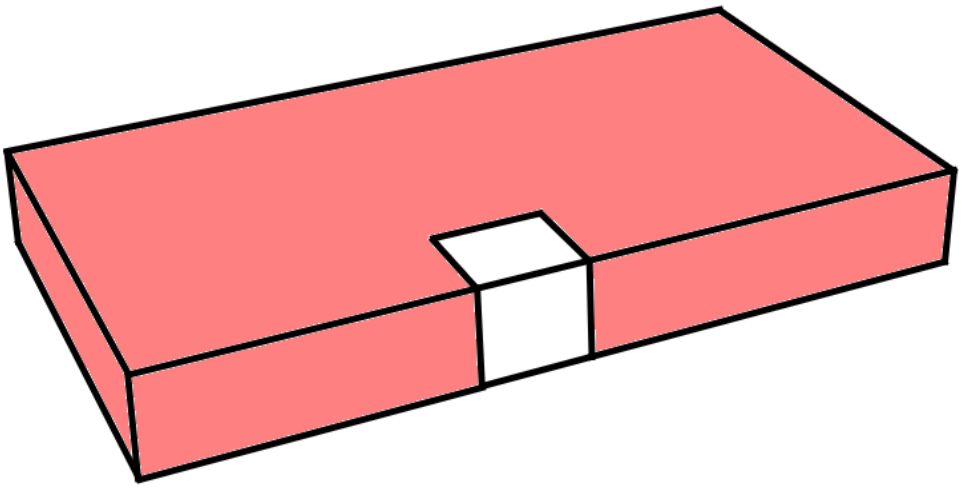
Example 8.1: Indirectly Conditioned Zone:
A store room on a mid-floor with no fixed HVAC installed, surrounded on 3 sides by a conditioned classroom and on one side by a conditioned corridor. (No heat loss from ceiling/ floor of store room)

HVAC Assigned to Store Room: Same as Classroom, in line with Indirectly Conditioned Space guidance in Section 3.5.9 of How to use iSBEMie (Volume 2).
Elements in Classroom and Corridor adjoining the store room: Conditioned Adjoining Space.



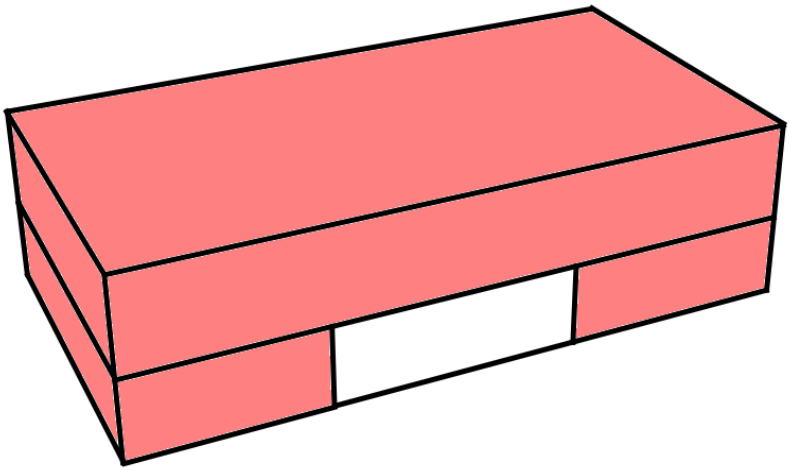
Example 8.2: Partially Conditioned Space:
A plant room surrounded on 3 sides by a conditioned office. The total surface area of the elements connecting to the conditioned offices is greater than 50% of the total element areas within the plant room. The walls between the office space and plant room are uninsulated and the external elements of the plant room are outside the thermal envelope of the building.

HVAC Assigned to Plant Room: Zones without HVAC system
Elements in Offices adjoining the plant room: UAS - partially conditioned by surrounding spaces



Example 8.3: Partially Conditioned Space:
A store room surrounded on 3 sides and above by conditioned offices. The total surface area of the elements connecting to the conditioned offices is greater than 50% of the total element areas within the store room. The store is within the thermal envelope of the building, the external wall and floor of the store are insulated to the same performance as the remainder of the building. The assessor can choose to:

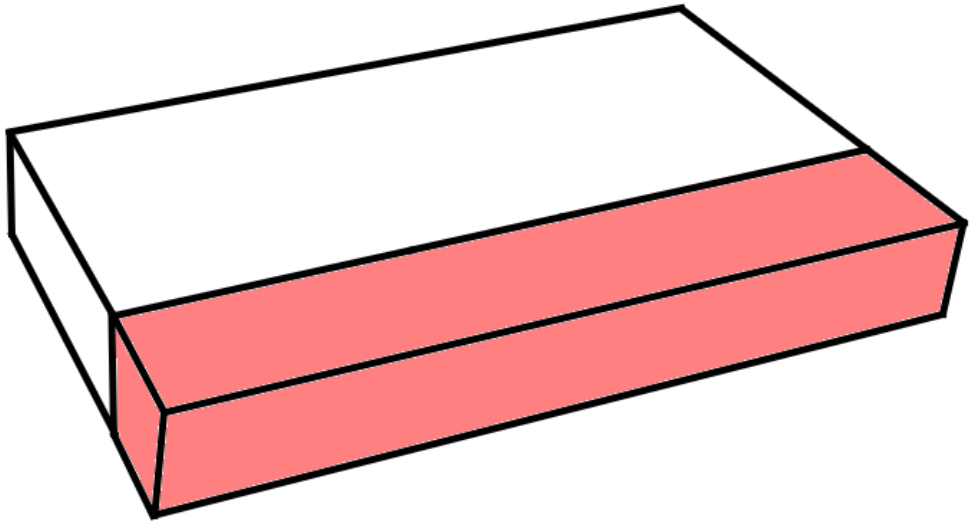
HVAC Assigned to Store Room: Same as Offices, in line with Indirectly Conditioned Space guidance in Section 3.5.9 of How to use iSBEMie (Volume 2).
Elements in Offices (walls and floor) adjoining the store room: Conditioned Adjoining Space.



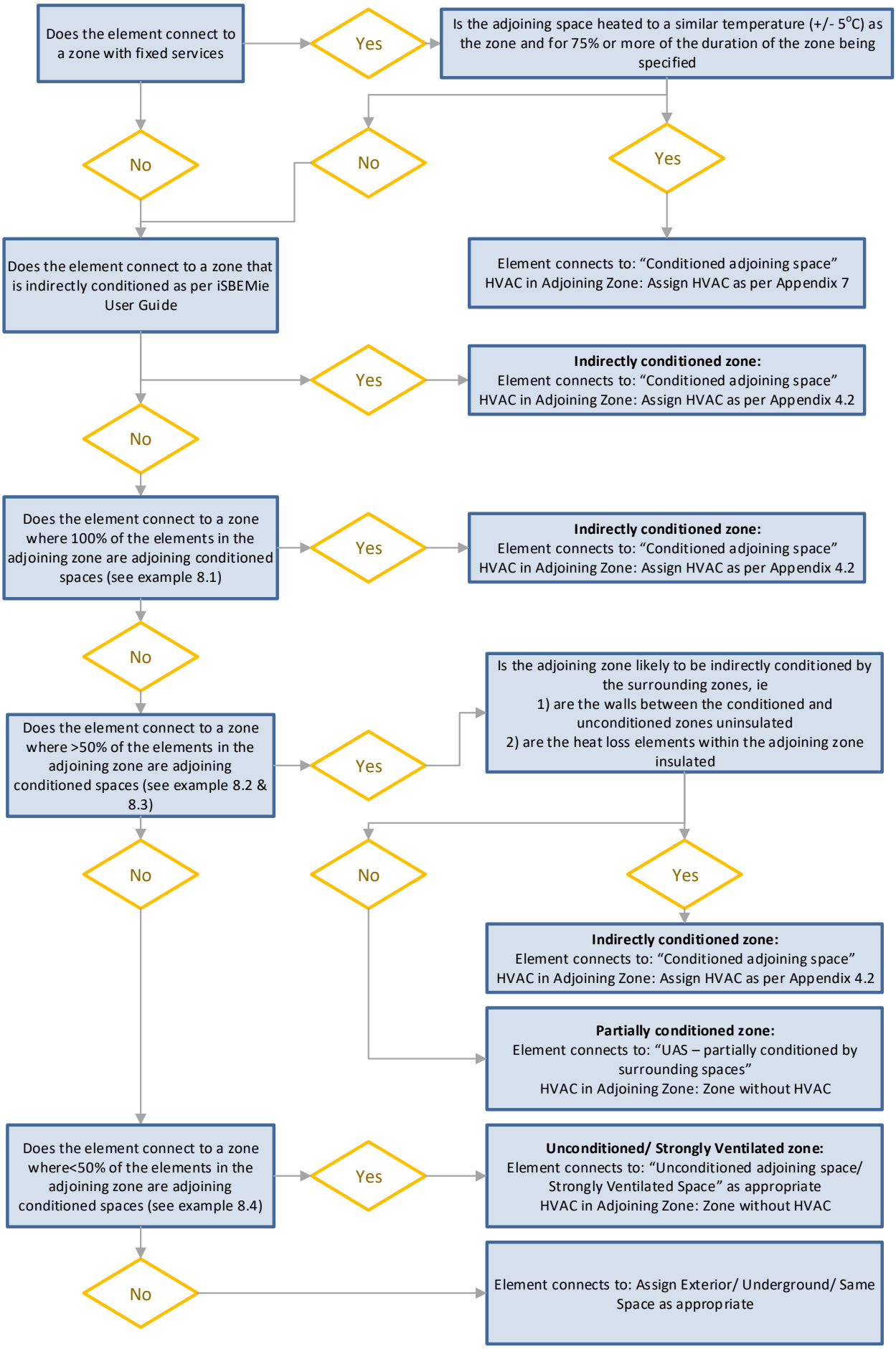
Example 8.4: Unconditioned adjoining space:
A warehouse connected on 1 side to a conditioned office. The total surface area of the elements connecting to the conditioned office is less than 50% of the total element areas within the warehouse.

HVAC Assigned to Warehouse: Zones without HVAC system
Elements in Offices adjoining the warehouse: Unconditioned adjoining space

While the Ru value calculation is not mandatory, assessors can adjust the U value of the element using the calculation.



The following flow chart gives details of when to assign alternate conditions:



Adjoining spaces, either within the building being assessed or the adjoining building are treated as follows in iSBEMie:

a) "Conditioned Adjoining Space" if the space adjoining the element (zx/xx/xi) has the same activity as the zone (zx/xx) or is normally heated to similar levels as the zone (i.e. heated to a similar temperature (+/-5°C) for 75% or more of the duration of the zone being specified.)

b) "Unheated Adjoining Space" or "Strongly ventilated spaces" if the above condition is not met.

The heating regime of the adjoining space is determined as follows:

1) If there is access to details of the zones within the adjoining building, base the parameters for the element on the activity and installed HVAC system within that zone.
2) If there is no access to the zones in the adjoining building, base the parameter for the element on the building type using the following simple matrix showing when a building is adjoining another building whether it is considered conditioned or unconditioned / strongly ventilated.

CAS - Conditioned Adjoining Space

Unconditioned Adjoining Space/ Strongly Ventilated Space

Building in BER Assessment / **Adjoining Building**	Others – Passenger Terminals	Community/Daycare Centre	Primary Health Care Building	Residential Institutions	Restaurant and Cafes/Drinking Establishments and Hot Food	Libraries Museums and Galleries	Offices and Workshop businesses	Residential spaces	Education	Retail and Financial/Professional services	General Assembly and Leisure plus Night Clubs and Theatres	Storage and Distribution	Others - Car Parks 24 hrs.
Others – Passenger Terminals													
Community/Daycare Centre													
Primary Health Care Building													
Residential Institutions													
Restaurant and Cafes/Drinking Establishments and Hot Food													
Libraries Museums and Galleries													
Offices and Workshop businesses													
Residential spaces													
Education													
Retail and Financial/Professional services													
General Assembly and Leisure plus Night Clubs and Theatres													
Storage and Distribution													
Others - Car Parks 24 hrs													

Appendix 9: Determining the Hot Water Storage Volume and Secondary Circulation Losses

Where there is access to the hot water storage unit, determine the storage volume as follows:

a. Determine the hot water storage volume from a label on the storage unit, provided the label also references a European or National Standard or is CE marked.
b. Take note of the Manufacturer and Model of the unit and determine the volume from literature from the manufacturer referencing the relevant standards.
c. Take note of the Manufacturer and Model of the unit and contact the manufacturer regarding the storage volume. The manufacturer must provide written confirmation of the storage volume.
d. Where data from the above sources is unavailable and the vessel is accessible, measure the volume of the unit on site. Further detail on this is provided below.
e. Where the hot water storage vessel is inaccessible, documentary evidence from the installer, architect or engineer identifying the volume of the installed vessel is used.
f. If none of these options are possible base it on the iSBEMie default.

Measuring a Hot Water Storage Cylinder:

1) Measure the height and diameter of the hot water storage vessel.

2) For cylindrical vessels that are between 71 and 441 litres, choose the nearest height and diameter options from the table below to determine the volume in litres. Insulation thickness is not included in the height or diameter measurement when using the table. The table below is based on BS1566 and applies to copper cylinders, however, these figures are also used for other types of storage vessels for the purposes of NEAP assessments.

   The storage vessel diameter is determined based on vessel circumference, dividing the circumference by π (3.14). Diameter should not include insulation thickness.

Diameter (mm)	Height (mm)	Storage volume
300	1600	96
350	900	72
400	900	96
400	1050	114
450	675	84
450	750	95
450	825	106
450	900	117
450	1050	140
450	1200	162
450	1500	206
500	1200	190
500	1500	245
600	1200	280
600	1500	360
600	1800	440

3) For cylindrical vessels outside this range, the volume is calculated based on the following:

   $V = (pi \times r^2) \times h / 1000$

Where: r = radius of the unit (cm)
h = height of the unit (cm)
pi = 3.142
V = volume of unit (litres)

For Enclosed Water Heaters:

The water heater volume is calculated by recording the height, width and depth of the water heater if the heater is cuboid or the above formula if cylindrical. The cuboid volume is then calculated as follows:

V = h x d x w x 1000

Where: d = depth of unit (m) minus the insulation thickness as appropriate.
h = height of unit (m) minus the insulation thickness as appropriate.
w = width of unit (m) minus the insulation thickness as appropriate
V = volume of the cylinder (litres)

For example

The diagram below shows a water heater with measured dimensions on site for a unit installed in 2005. The default insulation thickness is therefore 35mm.

The volume of the storage unit is therefore:

V = h x d x w x 1000

h = 550 – (35 x 2) = 480mm
d = 330 – (35 x 2) = 260mm
w = 330 – (35 x 2) = 260mm

Volume = 0.48 x 0.26 x 0.26 x 1000 = 32 litres

Secondary Circulation Losses:

Insulation of hot water pipework can be accounted for in the iSBEMie calculation. The table below gives indicative thickness of insulation for non-domestic hot water services to meet the maximum permissible heat loss set out in TGD L 2017.

Outside diameter of pipe on which	Water temperatures at 60°C for hot water with ambient still air of

insulation thickness has been based mm	15°C.					
	Thermal Conductivity at insulation mean temperature W/mK					
	0.025	0.030	0.035	0.040	0.045	Maximum permissible heat loss W/m
	Thickness of insulation					
17.2	12	17	23	31	41	6.60
21.3	14	19	25	33	43	7.13
26.9	15	21	27	35	45	7.83
33.7	17	22	29	37	47	8.62
42.4	18	23	30	38	47	9.72
48.3	19	25	32	40	49	10.21
60.3	20	26	33	41	50	11.57
76.1	22	28	35	43	52	13.09
88.9	22	28	35	43	51	14.58
114.3	23	29	36	43	51	17.20
139.7	24	31	37	44	52	19.65
168.3	25	32	38	45	53	22.31
219.1	26	32	38	45	52	27.52
273 and above	27	33	39	46	53	32.40

(Ref The TIMSA HVAC Guidance Document)

For entering the data into iSBEMie the assessor must get the average w/m, for example;

Hot Water Secondary Circulation installed with following pipework length and heat loss:

100m 17.2 dia 6.60 w/m
50m 33.7 dia 8.62 w/m
10m 76.1 dia 13.09 w/m

$$\text{Average} = \frac{100 \times 6.6 + 50 \times 8.62 + 10 \times 13.09}{100 + 50 + 10} = 7.64 \text{ w/m}$$

Appendix 10: Selection of Solid Fuel Type, Open fires & stoves

10.1: Selection of solid fuel type:

Solid fuel appliances can be fueled by coal, anthracite, smokeless fuel, dual fuel (mineral and wood) and biomass.

For solid fuel boilers and heaters the fuel type is chosen as follows, proceeding from points 1 towards 4 until a choice is made:

1) If the heating appliance is designed to burn only biomass, i.e. its design is such as to prohibit the use of any other fuel type, then the appropriate fuel type (biomass) should be selected. Otherwise biomass should not be selected. This can be demonstrated by one of the following:
    i. Documentation showing that the product warranty is void if the product is used with any fuel type other than biomass ;
    ii. Listing of the product under http://www.hetas.co.uk/ showing that the appliance burns biomass only.

   Where there is any doubt about fuel type selection biomass should not be selected.
2) If the appliance is designed to burn a particular coal-based or peat-based fuel type, then that should be chosen as the fuel.
3) If the appliance can burn more than one fuel type, the most likely non-biomass type should be selected based on (a) the appliance design, and (b) the building location (taking account of smoke control areas and fuels common in the area).

The following table summarises the information above:

Scenario	Biomass	Manufactured smokeless fuel	One of coal or anthracite
Appliance can only burn biomass	Yes	No	No
Appliance can burn multiple solid fuels but a particular fuel is the most commonly available or applicable non-biomass fuel in the area	No	Yes - Select manufactured smokeless fuel when building is in "smoke control area" and the appliance can burn multiple fuels	Yes - Select one of these fuels when building is in non "smoke control area" and that fuel is clearly the most commonly available fuel in the area

Smoke control areas (also called coal restricted areas) can be identified using the facility under http://maps.epa.ie or following guidance on the Department of Environment, Community and Local Government website. Individual Local Authorities may have further details.

10.2: Open fires & stoves

Open fires and stoves can be encountered in older buildings and some public houses. The following table describes the entries.

"Appliance"	System Type	Heat Source	Fuel Type	Seasonal Efficiency
Open Fire	Other local room heater - unfanned	Room Heater	Refer to guidance above	Enter 0.3
Stove	Other local room heater - unfanned	Room Heater	Refer to guidance above	Use the default 0.7 unless a non-default figure can be obtained

Where another heating source e.g. central heating using a boiler is present a bi-valent system may be required, or the space may need to zoned appropriately.

If the BER Assessor can determine that the chimney has been closed the appliance can be ignored.

Appendix 11: Identifying Common Lighting Systems

The following are examples of various lighting systems:

	**Tungsten Lamps or** **Tungsten Halogen Lamps**
	**Compact Fluorescents**
	**Tubular Fluorescents** T5: 16mm diameter T8: 26mm diameter T12: 38mm diameter
	**LED (Light Emitting Diodes)** Can be a complete new fitting or an existing fitting where an LED lamp replaces a less efficient lamp.

	**Metal Halide**

Appendix 12: Fuel Conversion Factors

The following table lists the Fuel Conversion Factors and Primary Energy Factors used by iSBEMie.

Fuel type	$kgCO_2/kWh$	Non Renewable Primary Energy Factor kWh/kWh	Renewable Primary Energy Factor kWh/kWh
Natural gas	0.203	1.1	0
LPG	0.232	1.1	0
Biogas	0.025	0.1	1
Fuel oil	0.272	1.1	0
Coal	0.361	1.1	0
Anthracite	0.361	1.1	0
Manufactured smokeless fuel	0.392	1.2	0
Dual fuel (mineral + wood)	0.289	1.1	0
Biomass	0.025	0.1	1
Grid supplied electricity	0.409	Grid Electricity	0
Grid displaced electricity	0.409	Grid Electricity	0
Electricity produced by renewables (PV/ Wind)	-	0	Grid Electricity
Solar Thermal	-	0	1
Heat Pump (Environmental Energy)	-	0	1
District Heating	District Heating Supplier	District Heating Supplier	District Heating Supplier