

## Software Tools for Energy Assessments

Calculation software implementing the UK National Calculation Methodology (NCM) is used in Scotland for three purposes:

- Demonstrating compliance of new buildings with Standard 6.1 (Carbon Dioxide Emissions) under building regulations.
- Producing Energy Performance Certificates for new buildings and where existing buildings are to be sold or rented and for display in 'public buildings'; and
- For production of Action Plans or Display Energy Certificates in building subject to The Assessment of Energy Performance of Non-domestic Buildings (Scotland) Regulations 2016.

This document provides information on approved software and on use of such tools to meet these requirements.

## Approved Domestic Software

Carbon dioxide emissions and energy ratings for dwellings are calculated using the UK Government's Standard Assessment Procedure for the Energy Rating of Dwellings (SAP). The Building Research Establishment (BRE) website lists SAP software approved for use in Scotland.

The current edition, SAP 2012 applies to all building warrants submitted on or after 1 October 2015 and for all EPC production on or after 20 March 2016.

For information on approved SAP 2012, as well as the updated SAP 2012 document and a link to the SAP 2012 conventions document, please visit the [BRE SAP 2012 website](#). A list of approved RdSAP software for existing dwelling EPCs is also provided.

For building warrants submitted before 1 October 2015, SAP 2009 remains the current edition for building regulations compliance but, from 20 March 2016, can no longer be used for EPC production. For information on approved SAP 2009, as well as the updated SAP 2009 document and a link to the SAP 2009 conventions document, please visit the [BRE SAP 2009 website](#).

## Approved Non-Domestic Software

The methodology for calculation of non-domestic building performance in the UK is the Simplified Building Energy Model (SBEM). The procedure for demonstrating compliance with the building regulations for non-domestic buildings calculates the annual carbon dioxide emissions for the proposed building and comparing them with those of a 'notional' building which has the same size and shape. Both calculations use standard sets of data for different activity areas and call on common databases of construction and service elements. A similar process is used to produce an 'asset rating' in accordance with the EPBD.

The NCM therefore comprises the underlying method and the standard data sets. The NCM allows the calculation to be carried out either by the SBEM (Simplified Building Energy Model) or by approved Detailed Simulation Modelling (DSM) software tools. Operational rating of non-domestic buildings is calculated using a separate Operational Ratings Methodology.

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As of 3 October 2018, the current edition of SBEM is v5.6a. Where practicable, this new edition should be used for the production of non-domestic EPCs, Action Plans and for carbon compliance calculations in support of new building warrant applications. However, as the new edition retains the small changes introduced in v5.4a to the calculation of building energy performance, v5.3a may still be used for 6.1 compliance for building warrants submitted on or after 6 April 2018. Where v5.3a is used applicants may wish to check that their choice of software continues to be supported by the software provider.

At present, as the reporting schema is unaffected by the edition change, versions 5.6a, 5.4b and v5.3a tools remain accepted for EPC and Action Plan lodgement to the Scottish EPC Register (<https://www.scottishepcregister.org.uk/>). The next update to the Register (Autumn 2019, date to be confirmed) will prevent the future use of v5.3a and v5.4a for EPC and Action Plan lodgement to ensure that the improvements delivered by the new edition are applied.

SBEM has a basic user interface, iSBEM, which is a free tool. iSBEM is updated to reflect amendments in [Section 6 of the Technical Handbooks](#) or improvements to the tool functionality. The latest version which is suitable for use in Scotland is listed below and is available for download at <http://www.ncm.bre.co.uk/>. SBEM is also implemented in commercial front-end software tools (FI-SBEM) that interface with the SBEM engine and Dynamic Simulation Modelling tools (DSM, which produce a more detailed environmental model). Information on use of the Action Plan function within Approved SBEM/DSM tools is published at [www.gov.scot/section63](http://www.gov.scot/section63).

Approved software tools can be used both to demonstrate compliance with Standard 6.1 of the Building Regulations and for producing EPCs or Action Plans, as set out in the tables below. Software approved for EPC use implements the current schema via EPCgen and the facility to produce an XML file for lodgement of data to the Scottish EPC register. Software approved for production of Display Energy Certificates and Advisory Reports also produces an XML file for lodgement of data to the Scottish EPC register.

**The following tools are currently approved, as indicated, to demonstrate compliance under standard 6.1 (carbon dioxide emissions) for building warrants submitted on or after 1 October 2015 and for EPC and Action Plan lodgement.**

SBEM/DSM software (NCM v5.3a, v5.4b & v5.6a)					6.1 compliance	EPC production	Action Plan
Software Name	NCM	Current Version	Date of Approval	Software Provider			
iSBEM	v5.3a	v5.3a	21/11/16	Building Research Establishment <a href="http://www.ncm.bre.co.uk/">http://www.ncm.bre.co.uk/</a>	Y	Y	Y

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SBEM/DSM software (NCM v5.3a, v5.4b & v5.6a)					6.1 compliance	EPC production	Action Plan
Software Name	NCM	Current Version	Date of Approval	Software Provider			
iSBEM	v5.4b	v5.4b	06/04/18	Building Research Establishment <a href="http://www.ncm.bre.co.uk/">http://www.ncm.bre.co.uk/</a>	Y	Y	Y
iSBEM	V5.6a	V5.6a	03/10/18	Building Research Establishment <a href="http://www.ncm.bre.co.uk/">http://www.ncm.bre.co.uk/</a>	Y	Y	Y
<b>FI-SBEM</b>							
DesignBuilder	v5.3a	v5.0.3.007	2/05/17	DesignBuilder Software Ltd <a href="http://www.designbuilder.co.uk">http://www.designbuilder.co.uk</a>	Y	Y	
	v5.4b	V5.4.0	1/06/18	As above	Y	Y	
	V5.6a	V6.1.0	22/05/19	As Above	Y	Y	Y
Design Database	v5.4b	v26.06.00.09	04/10/18	Bentley Systems (UK) Ltd <a href="http://www.bentley.com">http://www.bentley.com</a>	Y	Y	
G-iSBEM	v5.3a	V20.0	15/03/17	G-ISBEM Ltd <a href="http://www.g-isbem.com/">http://www.g-isbem.com/</a>	Y	Y	
Lifespan-SBEM	v5.3a	V5.3a	20/03/17	Property Tectonics Ltd <a href="http://www.property-tectonics.co.uk/">http://www.property-tectonics.co.uk/</a>	Y	Y	
Virtual Environment	v5.3a	v7.0.8	4/10/17	Integrated Environmental Solutions <a href="http://www.iesve.com/">http://www.iesve.com/</a>	Y	Y	
	v5.4b	v7.0.10	12/06/18	As above	Y	Y	Y
	v5.6a	v7.0.11	8/05/19	As above	Y	Y	Y
	V5.6a	V7.0.12	4/07/19	As above	Y	Y	Y
<b>DSM</b>							
Design Simulation	v5.3a	v26.06.00.05	04/05/16	Bentley Systems (UK) Ltd <a href="http://www.bentley.com">http://www.bentley.com</a>	Y		
TAS	v5.3a	9.4.1	06/03/17	Environmental Design Solutions Ltd <a href="http://www.edsl.net/">http://www.edsl.net/</a>	Y	Y	

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SBEM/DSM software (NCM v5.3a, v5.4b & v5.6a)					6.1 compliance	EPC production	Action Plan
Software Name	NCM	Current Version	Date of Approval	Software Provider			
Virtual Environment	v5.3a	v7.0.8	24/10/17	Integrated Environmental Solutions <a href="http://www.iesve.com/">http://www.iesve.com/</a>	Y	Y	Y
	v5.4b	v7.0.10	12/06/18	As above	Y	Y	Y
	v5.6a	v7.0.11	8/05/19	As above	Y	Y	Y
	V5.6a	V7.0.12	4.07.19	As above	Y	Y	Y
DesignBuilder	V5.4b	v5.4.0	1/06/18	DesignBuilder Software Ltd <a href="http://www.designbuilder.co.uk">http://www.designbuilder.co.uk</a>	Y	Y	
	V5.6a	V6.1.0	22/05/19	As Above	Y	Y	

The following tools are approved for production of Display Energy Certificates and Advisory Reports on or after 1 September 2016.

DEC software (ORCalc)			
Software Name	Current Version	Date of Approval	Software Provider
ORCalc Scotland	V1.0.0	01/09/16	Scottish Government (only available via Approved Organisations)

## Demonstrating compliance under standard 6.1 - Carbon Dioxide Emissions

On submitting a building warrant application, output from the carbon compliance calculation required under standard 6.1 should be provided. This is carried out using software, approved for use in Scotland, which implements:

- for dwellings, the edition of SAP current at the date on which the warrant application is made. In this respect, 'edition' refers to the dated edition of SAP (e.g. SAP 2009, SAP 2012) and not the version number (e.g. v9.81, v9.92).
- for non-domestic buildings, the version(s) of the National Calculation Methodology (NCM) current at the date on which the warrant application is made. In this respect, 'version' refers to the full descriptor of the calculation tool (e.g changes implemented in iSBEM v5.3a, v5.4b or v5.6a), as incremental updates may include changes to the assertions made or data used which may affect the calculation output.

However, as noted in clause 13 of the current [NCM Modelling guide for Scotland](#), following the introduction of v5.4b tools on 6 April 2018, applicants may still use v5.3a tools to demonstrate compliance in building warrant applications made on or after that date. This option is retained as v5.4b and onward editions can result in small changes in calculated TER and BER, affecting the efficacy of proposals when demonstrating compliance.

Otherwise, software implementing the previous version of the NCM (i.e. calculation tool and NCM databases) may be used for a period not exceeding six months following introduction of a new version of the NCM, provided a change in regulations does not require use of the current version (as was the case, for example, from 1 October 2010 and from 1 October 2015).

The edition/version of the relevant calculation methodology current at the date on which the warrant application is made would then be used for the duration of the project, including for any amendments to warrant, until works are complete. This ensures that requirements under standard 6.1 remain constant for the duration of the project and that action needed for compliance is unaffected by changes to the calculation methodology.

Whilst the same edition/version should be used for any amendment to the original warrant, at any stage applicants can elect to adopt a more recent edition/version. Having elected to do so however, applicants may not revert to use of a previous edition/version.

Information on the date of introduction of current editions/versions of approved calculation software tools can be found above.

## Issue of Domestic or Non-domestic EPC with Completion Certificate under standard 6.9 - Energy Performance Certificates

Following completion of the proposed building, the Energy Performance Certificate which is to be submitted to the verifier with the completion certificate, should be produced using approved software which implements the current edition and version of the relevant calculation methodology. These are listed above. This ensures that building owners are presented with the most current and relevant information practicable.

This may result in use of a different version or edition of the relevant calculation method than was used for the carbon compliance calculation under standard 6.1. In such circumstances, the party responsible for producing the EPC will normally export the building model used in the carbon compliance calculation into the current version of their chosen software tool.

For buildings which are the subject of a building warrant applied for on or after 9 January 2013, the EPC which accompanies the completion certificate must be produced from data lodged to the Scottish EPC register. Such data can only be lodged to the register by an assessor who is a member of an Approved Organisation. As the work of EPC assessors is subject to audit by their Approved Organisation, the local authority need only verify that the submitted EPC matches the information recorded on the register.

If, after reading the information on our website ([www.gov.scot/section63](http://www.gov.scot/section63)), you have further questions, please email [buildingstandards@gov.scot](mailto:buildingstandards@gov.scot) (please use 'Software Tools for Energy Assessments' as the email subject) or call 0131 244 6538.

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## Annex A – tools still relevant to building warrant applications made prior to 1 October 2015.

The following tools were approved to demonstrate compliance under standard 6.1 (carbon dioxide emissions) for building warrants submitted before 1 October 2015. They may still be used in support of such building warrants until a completion certificate is accepted. Note: from 20 March 2016, v4.1e tools can no longer be used for EPC production and lodgement to the Scottish EPC register.

<b>SBEM/DSM software for Standard 6.1 compliance, Section 6 2010 only (NCM v4.1e)</b>			
<b>Software Name</b>	<b>Current Version</b>	<b>Date of Approval</b>	<b>Software Provider</b>
iSBEM	v4.1e	28/01/2013	Building Research Establishment <a href="http://www.ncm.bre.co.uk/">http://www.ncm.bre.co.uk/</a>
<b>FI-SBEM</b>			
Carbon Checker	Carbon Checker v1.7.3	15/02/2013	BuildDesk Ltd <a href="http://www.builddesk.co.uk/">http://www.builddesk.co.uk/</a>
DesignBuilder	v4.2.0	07/04/2015	DesignBuilder Software Ltd <a href="http://www.designbuilder.co.uk/">www.designbuilder.co.uk/</a>
Design Database	v25.05	04/07/2014	Bentley Systems (UK) Ltd <a href="http://www.bentley.com/">http://www.bentley.com/</a>
GI-SBEM	Standard v17.0 Site Notes v17.0	08/02/2013	G-ISBEM Ltd <a href="http://www.g-isbem.com/">http://www.g-isbem.com/</a>
Lifespan-SBEM	v4.1e	15/02/2013	Property Tectonics Ltd <a href="http://www.property-tectonics.co.uk/">http://www.property-tectonics.co.uk/</a>
Virtual Environment	v 6.4.0.12	22/02/2013	Integrated Environmental Solutions <a href="http://www.iesve.com/">http://www.iesve.com/</a>
Pro EP Cert	v25.05	17/04/2011	Bentley Systems (UK) Ltd <a href="http://www.bentley.com/">http://www.bentley.com/</a>
<b>DSM</b>			
TAS	9.2.1.5	28/01/2013	Environmental Design Solutions Ltd <a href="http://www.edsl.net/">http://www.edsl.net/</a>
Virtual Environment	v 6.4.0.12	22/02/2013	Integrated Environmental Solutions <a href="http://www.iesve.com/">http://www.iesve.com/</a>