

Climate Change and Sustainability

Practice Note Addendum

Changes to the application and methodology of local plan policy BCS14 (Sustainable Energy)

June 2023



1. Introduction

On 15 June 2022, national Building Regulations were updated to enhance energy performance standards for new buildings through Part L 2021.

As a result of technical changes in Part L 2021 from Part L 2013 Bristol City Council (BCC) has introduced some technical changes to the methodology for meeting local plan policy BCS14 Sustainable Energy, as well as some other related changes.

This note provides details on how to meet the requirements of policy BCS14 following the introduction of Part L 2021, it includes the following:

- Demonstrating compliance with BCS14
- Treatment of district heat networks within BCS14
- Updated energy calculation templates

For more information please contact sustainable.city@bristol.gov.uk.

2. Demonstrating compliance with BCS14

Local Plan policy BCS14 has four key parts:

- Developments should meet and exceed requirements of the Building Regulations through energy efficiency measures alone.
- Developments should follow the heat hierarchy to connect to district heat networks, or utilise communal or individual renewable heat systems where connection to a heat network is not available or planned at the time of commencement.
- Developments should provide renewable technologies to achieve a 20% reduction in regulated carbon emissions compared to residual emissions.
- Any carbon reduction requirements that can't be met on site should be offset – usually by paying into the BCC allowable solutions fund.

Setting the 20% carbon reduction relative to the Building Regulations in this way means that the minimum requirements of the policy step up each time the Building Regulations are updated. This approach was taken when Part L 2013 came into force.

Since the introduction of Part L 2021, this approach has been retained and development should continue to meet the requirements set out above, with energy efficiency remaining a vital first step of the energy hierarchy. However, some flexibility has been introduced for development that cannot meet Part L without the use of renewable technology¹. This is due to the Part L 2021 Target Emissions Rate² including an assumption of renewable technologies being used.

¹ This includes heat pump technologies. See section 1.6 for a detailed definition of renewable technologies.

² The maximum CO₂ emission rate for the building determined for Building Regulations compliance

In addition, if district heat networks include renewable technologies, an equivalent proportion of heat provided by the heat network can contribute to development meeting the BCS14 requirement for 20% carbon emissions reduction from renewables.

The following sections replace the steps for demonstrating compliance with BCS14 within Section 3.2.1. and Appendix 1 of the Climate Change and Sustainability Practice Note (July 2020).

2.1. Residential and non-residential major development

To demonstrate compliance with policy BCS14, an energy strategy must clearly identify the CO₂ emissions of the development for each stage of the energy hierarchy, addressing each of the following steps:

1. Model buildings following the current Part L of the Building Regulations and predict regulated CO₂ emissions using the Part L Target Emission Rate (TER)³. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note' for advice on how to calculate the TER baseline.
2. Reduce energy consumption by amending the design to include additional energy efficiency measures that exceed the energy requirements of Building Regulations.

Heating systems used in step 1 as per the notional building should be used in the calculation at this stage in order to show energy efficiency improvements only.

In some cases it may not be feasible for total CO₂ emissions after energy efficiency measures are included to be lower than those calculated at step 1. In these cases, energy efficiency measures will be assessed through comparison of proposed measures to those set in the Notional Building specification⁴ and the information provided in the detailed energy tables (see section 2.2 for more details).

3. Calculate the 'residual emissions' – the emissions of the proposed design with energy efficiency measures (including savings from CHP if using, and non-

³ Note that for residential development this is based on a building with a gas boiler (unless connecting to an existing district heat network), as is used in the notional building. For buildings other than dwellings this is based on the notional building for the proposed design (i.e. with a district heat connection or renewable heat source) rather than a building with a gas boiler. This aligns with the Part L methodology.

⁴ A theoretical building of the same size and shape as the actual building with standardised properties for fabric and services, used for the purposes of Building Regulations calculations

renewable part of the heat network if connecting) but before the application of renewable technologies. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note', which sets out figures to enter into the calculations. If the emissions of the proposed development after energy efficiency measures is higher than the TER (i.e. Building Regulations cannot be exceeded through energy efficiency alone), the TER should be used as the residual emissions figure.

4. Utilise renewable energy technologies to reduce residual emissions by at least 20%. If connecting to a district heat network, any renewable portion of the heat to the development should be accounted for at this stage – see Section 3 for further details. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note', which sets out figures to enter into the calculations. If a heat pump is proposed, the proposed heat pump efficiency should be added at this stage.
5. Where it can be demonstrated that it is not possible to meet a 20% reduction in residual CO₂ emissions using renewable energy on site, off-site and allowable solutions may be considered.

New energy table templates have been created to support these calculations - see Section 4.

Applications should provide the relevant SAP Worksheets, BREL Compliance Reports and BRUKL documents in the appendices to the Energy Strategy.

2.2. Development that cannot meet the Building Regulations Target Emissions Rate through energy efficiency alone

BCS14 states that development in Bristol should minimise energy demand in accordance with the energy hierarchy. We expect development to achieve compliance with Part L through energy efficiency measures alone wherever possible, by demonstrating that CO₂ emissions at step 2 are lower than at step 1 as calculated above.

Due to the inclusion of renewable technologies in the notional building in some scenarios, there may be some cases where this is not technically feasible. In these cases, improvements in energy efficiency will be assessed through comparison of proposed measures to those set in the notional building specification and the information provided in the detailed energy tables.

Applications should provide the relevant SAP and BRUKL documents in the appendices to the Energy Strategy.

If the TER cannot be exceeded through energy efficiency alone the TER should be used as the residual emissions figure to demonstrate compliance with the 20% emissions reduction through renewables.

In these cases:

- Energy efficiency improvements on the Part L notional building must be demonstrated using table 4.2.1 for residential and table 4.2.2 for non-residential
- For residential development the 'TER without PV' should be calculated. This shows the Building Regulations energy target without renewables included. To demonstrate compliance with BCS14, this target must be exceeded through energy efficiency alone as demonstrated by table 4.2.1.
- 20% carbon emissions reductions must be achieved through renewable technologies when compared the Part L TER. (For development connecting to a heat network, see section 2 for more information on how this this applies.)

2.3. Mixed use development

Development containing elements classed as dwellings and non-dwellings should follow the steps above for the relevant elements. The energy consumption and emissions for the separate elements (dwellings and non-dwellings) and a combined total for the development should be presented.

2.4. Minor development

Minor development that falls under Part L 2021 should follow the BCS14 heat hierarchy:

- Development in close vicinity of an existing district heat network is encouraged to explore whether a connection is possible.
- Where this is not feasible, minor development should employ individual renewable heat or communal renewable heat technologies which are fossil fuel free.

Minor development should follow the same process for energy calculations as major development, as described in section 1.1.

2.5. Carbon factors

Gas and electricity

The carbon emissions factors for gas and electricity that underpin the current Part L at the time of submitting the planning application, should be used for BCS14 carbon emissions calculations.

District heat networks

The carbon emissions factors for district heat networks that should be used for BCS14 calculations should be sought from the heat network operator and provided for reference in the detailed energy tables (see table 4.2.4 below).

2.6. Renewable technologies

Renewable technologies are defined in detail in Appendix 3 of the BCC Climate Change and Sustainability Practice Note, please also note the following:

- Air, water and ground source heat pumps are treated as renewable technologies for the purpose of BCS14. Only the generation of heat from these technologies counts towards the BCS14 carbon reduction through renewables requirements.
- Air, water or ground source VRF systems are treated as renewable technologies for the purpose of BCS14. Only the generation of heat from these technologies counts towards the BCS14 carbon reduction through renewables requirements i.e. energy for cooling cannot contribute to compliance with BCS14 carbon reduction through renewables requirements.
- In line with UK government guidance⁵, to be considered a renewable technology a system must have a design seasonal performance factor (SPF) of at least 2.5. Applicants must provide confirmation of the system SPF. This should include manufacturer information and technical evidence within the energy statement that stated SPFs can be achieved in the proposed design.

3. Treatment of district heat networks

If a proportion of the heat provided by a district heat network is provided by renewable technology this proportion can contribute to a development meeting the BCS14 requirement for 20% carbon emission reduction from renewables technologies.

Case study – Bristol heat network

Historically, the heat supply from the BCC district heat network (thereafter operated through the City Leap partnership) has been from low carbon sources with a minority of the annual heat generated from renewable sources. The construction and commissioning of the Castle Park Energy Centre in summer 2022, which is supplied by a water source heat pump, means that the majority of the heat supplied by the network will be from renewable sources. By 2024, it is projected that over 80% of the heat supplied will be from renewable sources.

⁵ Ofgem, Non-domestic Renewable Heat Incentive Guidance Volume 1, April 2020

Table 4.1.2. provides a template for calculating savings from renewable and non-renewable energy within district heat networks.

The renewable proportion of any district heat network should be provided by the heat network operator and included for reference in the detailed energy tables (see table 4.2.4 below). For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note', which sets out figures to enter into the calculations.

Due to the way that the Part L methodology calculates the TER for buildings connected to an existing heat network, additional flexibility in the application of BCS14 may be needed for these developments. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd, the recommended approach has been set out within section 2.1 above. For buildings connecting to any other existing heat network, the applicant should contact the Sustainable City team to agree the approach for the development (sustainable.city@bristol.gov.uk).

4. Updated energy calculation templates

The tables provided below should be used to determine the residual emissions and calculate the CO₂ reduction due to renewable energy.

4.1. Summary table

For ease of use the summary table has been separated into development that is connecting to a district heat network and development using other low carbon energy systems.

These tables replace the Summary Table within Appendix 1: Standard template for Energy Strategies in Climate Change and Sustainability Practice Note (July 2020).

The relevant table(s) must be completed for all Energy Strategies.

4.1.1. No district heat connection

NO DISTRICT HEAT CONNECTION	Regulated Energy Demand (MWh/yr)	Regulated CO2 emissions (tonnes/yr)	CO2 saved (tonnes/yr)	% CO2 reduction
Baseline - Part L TER <i>See Note 1</i>		A	-	-
Proposed scheme after energy efficiency measures <i>See Note 2</i>		B	A - B	$((A - B) / A) \times 100$
Residual emissions Proposed scheme after energy efficiency measures and CHP (if using)		C	B - C	$((B - C) / B) \times 100$
Proposed scheme after on-site renewables <i>See Note 4</i>		D	C - D	$((C - D) / C) \times 100$ (NOTE: THIS SHOULD BE MIN. 20% TO COMPLY WITH BCS14 <i>See Note 5</i>)
Total CO2 reduction beyond Part L TER <i>See Note 5</i>			A - D	$((A - D) / A) \times 100$ (NOTE: THIS SHOULD ALSO BE 20% TO COMPLY WITH BCS14)

4.1.2. Development with district heat connection

DEVELOPMENT WITH DISTRICT HEAT CONNECTION	Regulated Energy Demand (MWh/yr)	Regulated CO2 emissions (tonnes/yr)	CO2 saved (tonnes/yr)	% CO2 reduction
TER baseline emissions <i>See Note 1a</i>		A	-	-
Proposed scheme after energy efficiency measures. <i>See Note 2</i>		B	A - B	$((A - B) / A) \times 100$
Residual Emissions Proposed scheme after connection to the DH network (calculation of savings relating to non-renewable part of the network only). <i>See Note 3</i>		$R = B - ((B - C) \times (1 - Y))$	B - R	$((B - R) / B) \times 100$
Proposed scheme after connection to the DH network <i>See Note 3a</i>		C	R - C	$(R - C) / R \times 100$ (NOTE: THIS IS % REDUCTION BEYOND RESIDUAL EMISSIONS FROM THE RENEWABLE PART OF THE DH NETWORK)
Proposed scheme after all on-site renewables. <i>See Note 4</i>		D	R - D	$((R - D) / R) \times 100$ (NOTE: THIS SHOULD BE MIN. 20% TO COMPLY WITH BCS14 <i>See Note 5</i>)
Total CO2 reduction beyond Part L TER baseline. <i>See Note 5</i>			A - D	$((A - D) / A) \times 100$ (NOTE: THIS SHOULD ALSO BE MIN. 20% TO COMPLY WITH BCS14)

Note 1

The Part L TER figure should be used to calculate the baseline. For dwellings not connecting to an existing heat network, the Part L methodology sets the Notional Building heat source as gas boilers to calculate the TER,. For buildings other than dwellings that are not connecting to an existing heat network, the Part L methodology sets the building heat source as the same type proposed in the design to calculate the TER with notional efficiencies.

Note 1a

The TER figure should be used to calculate the baseline. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note' for advice on how to calculate the TER figure for this step.

For buildings connecting to any other existing network, applicants should contact the Sustainable City team to agree the approach (sustainable.city@bristol.gov.uk).

For buildings connecting to a new heat network, the Part L methodology sets the Notional Building heat source as gas boilers to calculate the TER for dwellings, and as a heat network with notional carbon factor and primary energy factor for buildings other than dwellings.

Note 2

This is based on the Actual Building, including the proposed energy efficiency measures. It's understood that in some cases it may not be feasible for CO₂ emissions to meet or be lower than the Part L TER at this stage due to PV being included in the TER calculation. Energy efficiency measures will also be assessed through comparison of proposed measures to those set in the Notional Building specification and the information provided in the detailed energy tables.

See Note 5 below.

Note 3

Y = Proportion of heat network supplied heat classed as renewables. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of 'Bristol Heat Networks Part L 2021 Guidance Note' for figures to enter into the calculations.

Note 3a

This is based on the Actual Building with a heat network as the heat source i.e. emissions after connecting to the network, including both renewable and non-renewable parts of the network. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd. contact BristolBusDev@Vattenfall.com for a copy of

'Bristol Heat Networks Part L 2021 Guidance Note', for figures to enter into the calculations.

Note 4

This is based on the Actual Building for the proposed design, including all low carbon and renewable energy generation.

Note 5

In some cases where it can be demonstrated that it is not feasible for the 'residual emissions' to be lower than the TER, for the purpose of assessing compliance with BCS14, the 20% calculation will be assessed against the Part L TER.

4.2. Detailed energy tables

The following tables should be completed based on energy information in the SAP Worksheets and BRUKL documents.

4.2.1. Residential energy efficiency table

The following table will be used to assess the energy efficiency of residential development.

The Notional Building TER without PV can be calculated using the 'Energy Saving/generation technologies' figure provided in the Building Regulations England Part L Compliance Report⁶.

Notional Building TER without PV (kg/CO ₂ /m ²)	Emissions for the proposed building with energy efficiency alone (kg/CO ₂ /m ²)
U-values and air permeability must be provided in table 4.2.3 below	

⁶ [TER (from BREL Compliance Report)] + [Box 269 from TER SAP Workbook / Total Floor Area (from BREL Compliance Report)]

4.2.2. Non-residential energy efficiency table

The following table will be used to assess the energy efficiency of non-residential development. It should be based upon the figures in the Energy Consumption by End Use table in the BRUKL documents for the development. The baseline should be the Notional Building based on the proposed development heat source (e.g. heat pump or district heating). No reduction in energy consumption from on-site electricity generation or solar thermal systems should be included. The fuel type (e.g. electricity, district heating etc.) should be provided for each end use.

	Notional building		Proposed building	
	Energy consumption	Fuel type	Energy consumption	Fuel type
Heating (MWh/year)				
Hot water (MWh/year)				
Cooling (MWh/year)				
Auxiliary (MWh/year)				
Lighting (MWh/year)				
Total (MWh/year)		-		-
Total per GIA (kWh/m²/year)		-		-

4.2.3. Energy efficiency measures

Provide a summary table of U values taken from the SAP /SBEM calculations:

Element or System	Part L Values (2021 - or most current)				
	Dwellings Limiting	Dwellings Notional	Non Dwellings Limiting	Non Dwellings Notional	Proposed
Wall	0.26	0.18	0.26	0.18	
Roof	0.16	0.11	0.18	0.15	
Floor	0.18	0.13	0.18	0.15	
Windows	1.6	1.2	1.6	1.4	
Doors	1.6	1.0	1.6	1.6	
Rooflights	2.2	1.7	2.2	2.1	
Air permeability	8	5	8	3	

4.2.4. Connection to off-site district heating or on-site CHP

Provide information on how the CHP has been sized (e.g. heat demand profile and electricity demand profiles)

Annual heat generation (kWh)	
Annual electricity generation (kWh)	
Annual operating hours	
Thermal storage required (litres)	
CHP size – enter installed capacity (kW _{th} , kW _e) (if applicable)	
CHP type – manufacturer model (if applicable)	
District heat network carbon factor (kg CO ₂ e/kWh)	
Renewable heat proportion (%)	

Evidence that the CHP meets the required air quality standards should be included in the air quality statement.

4.2.5. On-site renewables

Set out what renewable energy sources have been incorporated into the proposed development and the resulting estimated annual yield (kWh).

This can include emission savings from the use of renewable fuels to power CHP.

Renewable electricity – enter the total installed capacity (kW)	
Renewable electricity – enter the estimated annual yield (kWh) from renewable measures generating electricity (where available apply recognised standard methodologies such as the Microgeneration Certification Scheme (MCS) methodology for Solar PV)	
Renewable heat – enter the total installed capacity (kW)	
Renewable heat – enter the estimated annual yield (kWh) from renewable measures generating heat	

4.2.6. Allowable solutions

Where the full requirements of policy BCS14 cannot feasibly delivered on-site, and an alternative approach has been agreed with the planning authority, set out any further savings that will be achieved together with a description of the agreed allowable solution.

Additional saving on residual emissions from allowable solutions (kgCO ₂ pa)	
Total savings on residual emissions from renewables and allowable solutions (%)	

Appendix 1: Frequently Asked Questions

Update to BCS14 methodology

Why are we making this change?

A new version of the energy efficiency requirements of Building Regulations (Part L 2021) came into force in June 2022. This introduces more stringent regulated CO₂ emissions standards (on average a 27% reduction on Part L 2013) and updates the calculation methodology for demonstrating compliance with Building Regulations.

The implementation of BCS14 under 2013 Building Regulations was based on the assumption that compliance with the Building Regulations could be achieved without renewable technologies. However, a significant update to the methodology is that the baseline emissions target within Building Regulations is set based on solar PV generation and/or a heat pump being included in the development. This means it may not be technically feasible or viable for some development to achieve compliance with Building Regulations without including renewable technologies. The updated BCS14 methodology allows these developments to use renewable technologies to achieve Part L 2021 and then provide further renewable capacity to meeting the 20% reduction in regulated CO₂ emission as required under BCS14.

This updated methodology will be in place until the adoption of the new Local Plan in 2024. The updated energy and carbon policies for the new Local Plan will be consulted upon from November 2022 – January 2023, these are available on the council website 'Local plan review' pages

<https://www.bristol.gov.uk/files/documents/5446-bristol-local-plan-review-nov-22-further-consultation/file>.

Does the change to the methodology water down carbon emission standards for development?

The change in methodology does not reduce the level of overall regulated CO₂ emissions reduction required beyond Building Regulations compared to the previous methodology. Development will still be expected to achieve at least a 20% reduction in regulated CO₂ emissions beyond the current version of Part L of the Building Regulations.

Does the new methodology disincentivise the use of energy efficiency measures in favour of renewable technologies?

The updated methodology and detailed energy tables required to be submitted within energy strategies are designed to ensure that good practice energy efficiency measures, that exceed the requirements of the Building Regulations, are achieved.

When will the new methodology come into use?

There will be a transition period of 3 months for new submissions where both 2013 and 2021 methodology will be accepted. From April 2023 the Part L 2021 baseline and new methodology should be used for all applications.

What about development proposals already in the planning system?

For schemes currently in planning using the Part L 2013 methodology this will be retained throughout the planning process for the application (including any relevant planning conditions attached). The new methodology will not be applied retrospectively.

Heat networks in BCS14

Why are we making this change?

Historically, the heat networks have been classed as an energy efficiency measure in the BCS14 methodology. With the construction of the Castle Park heat pump energy centre, in addition to existing biomass boilers, the majority of the heat supplied to the Bristol city centre network is now from renewable sources and this is projected to increase to 80% of the heat supplied by 2024.

Allowing the proportion of renewable heat supplied by heat networks to count towards the 20% reduction in regulated CO₂ emissions from renewable technologies means that Bristol planning policy treats the supply of renewable heat consistently between heat networks and building level technologies such as heat pumps.

Due to the way that the Part L methodology calculates the TER for buildings connected to a heat network, we are aware it may be challenging for some types of development connecting to a network to meet the Part L TER and therefore the requirements of BCS14. For buildings connecting to a heat network owned by Bristol Heat Networks Ltd, the recommended approach has been set out within the guidance above. For buildings connecting to any other existing heat network, the applicant should contact the Sustainable City team to agree the approach for the development (sustainable.city@bristol.gov.uk).

Carbon pricing

Why are we making this change?

Due to the change in the carbon factors in Part L 2021 the cost of offsetting any shortfall in achieving the BCS14 target at £95/tonne would become considerably cheaper for developers, which may disincentivise on-site measures.

How has the offset cost been derived?

The £373 figure is based upon the high carbon valuation for 2022 in UK Government Green Book Supplementary Guidance: Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal. This is the same basis as the previous £95/tonne figure but updated to the latest figures from the government. Further detail on the rationale behind the £373 figure can be found in this report by the South West Net Zero Hub

The carbon factors for electricity within the Part L 2021 software are approximately 75% lower than they were under Part L 2013. This means the offset costs per unit of

energy for the previous £95/tonne figure and the new £373/tonne figure are very similar. Using the Part L 2013 carbon factors, 1 MWh of electricity is equivalent to 0.519 tonnes of CO₂, which at £95/tonne is valued at £49. Using the Part L 2021 carbon factors, 1 MWh of electricity is equivalent to 0.136 tonnes of CO₂, which at £373 is valued at £51.

