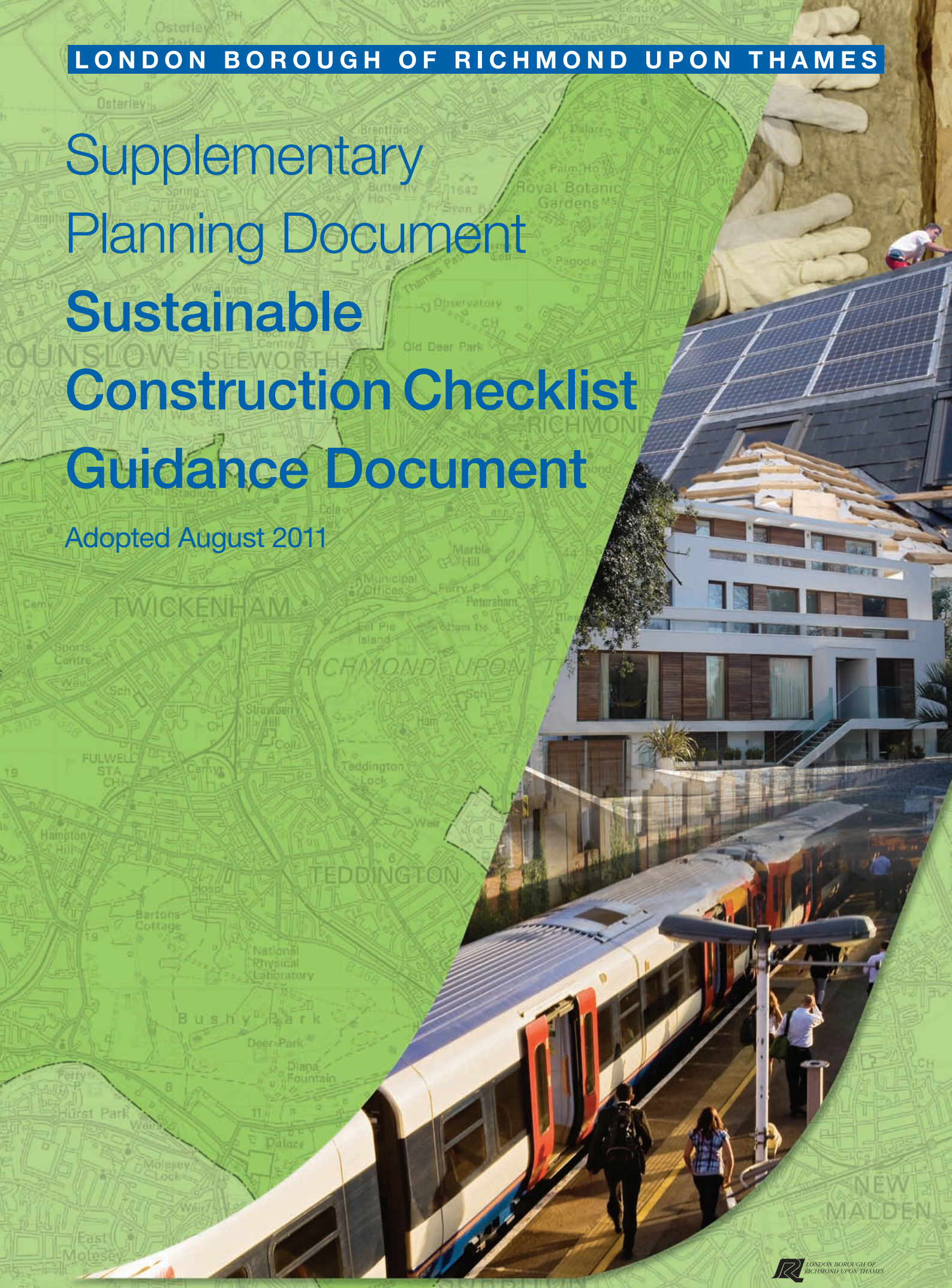
LONDON BOROUGH OF RICHMOND UPON THAMES

Supplementary Planning Document

Sustainable Construction Checklist Guidance Document

Adopted August 2011



LONDON BOROUGH OF RICHMOND UPON THAMES

Contents

1 Introduction

This Sustainable Construction Checklist SPD forms part of the assessment for planning applications for new build, conversion and retrofit properties within the London Borough of Richmond upon Thames. The aim of this Checklist is to engage and inform developers on sustainability issues relevant to their development. This will enable all building works to make an increased contribution towards local sustainability, and help create a townscape which will adapt to climate change as well as mitigate its effects. Overall, measures will be implemented towards improving cost efficiency of our buildings, minimising environmental impact, and improving quality of life for all of those in the Borough of Richmond.

The Checklist forms a **mandatory** part of the planning application for the following classes of development:

- All new residential development providing **1 or more new dwellings**, including conversions and extensions that create one or more new dwellings.
- All new non-residential development providing **100m^2 or more floor area**, including extensions over 100m^2.

Other classes of development which require planning permission but do not fit into the above categories, specifically including retrofits, conversions or extensions of residential or non-residential development that do not meet these thresholds, are **encouraged to comply** with this Checklist as far as possible.

This Checklist **does not** replace the requirement to comply with any relevant provisions of the Building Regulations.

It is recommended that developers consider the Checklist's requirements at an early stage in order to incorporate provision for sustainability as easily as possible into their designs. This will ensure maximum viability for sustainability solutions, and avoid the need for costly, late-stage design alterations.

2 Checklist contents

The Checklist will be used to assess compliance with Richmond Borough's minimum policy requirements with regards to environmental ratings under the Code for Sustainable Homes or BREEAM (Building Research Establishment Environmental Assessment Method) as well as energy and carbon dioxide emissions savings. Applicants must therefore ensure they provide all the necessary information required for the initial minimum policy compliance section of the Checklist.

In addition, the Checklist covers relevant matters not assessed under the Code for Sustainable Homes or BREEAM (see sections 1 to 6) and in each section, points may be gained for providing design features which contribute towards better sustainability practice. As a result, the Checklist will also measure 'additional' sustainability impacts of the proposed development which are particularly relevant to Richmond Borough, and which will not require repetition of information already provided as part of a Code for Sustainable Homes or BREEAM assessment submitted for compliance with the Council's minimum policy requirements.

The Checklist covers a range of sustainability issues, from energy consumption to site accessibility. Each section should be completed to the best of the developer's ability or knowledge when applying for planning permission.

Some areas of the Checklist ask for further information or **supporting evidence** to be submitted with the planning application. The minimum policy compliance requires the following:

- A Code for Sustainable Homes and/or BREEAM preliminary-assessment (as relevant) undertaken by an accredited assessor;

- An EcoHomes preliminary-assessment (relevant for domestic conversions only) undertaken by an accredited assessor. (It should be noted that this standard will be updated by the forthcoming BREEAM Domestic Refurbishment.)

- An Energy Statement: This is an assessment of expected energy demand at the site, showing how energy and carbon dioxide emissions will be reduced through designing for minimum energy use and installing on-site renewable energy in line with LBRuT requirements. Further guidance regarding producing an Energy Statement can be found in section 7 of this document.

Code for Sustainable Homes, EcoHomes and BREEAM assessments and certifications will only be accepted if they have been carried out by a licensed Code for Sustainable Homes, EcoHomes and BREEAM Accredited Assessor respectively. It is important to ensure that the assessor is accredited by a scheme that has been approved by the Department for Communities and Local Government (CLG). There are currently only two bodies that can provide this training: BRE Global Ltd and Stroma Accreditation Ltd (the latter only for the CfSH accreditation and not BREEAM).

The "Green Book Live" by BRE Global Ltd provides a wide range of products and services as well as a directory and database for licensed and accredited Energy and BREEAM assessors, including for all BREEAM schemes, Code for Sustainable Homes and EcoHomes:
http://www.greenbooklive.com/search/index.jsp.

Once planning permission is awarded, the Council will also require a design stage assessment prior to construction and a post construction review to be undertaken by a BRE accredited assessor. A BREEAM and/or Code Level certificate confirming that the completed development has met the required ratings must finally be provided prior to occupation of the building.

Minimum information requirements for: all new residential development providing 1 or more new dwellings all new non-residential development providing 100m^2 or more floor area		
	Environmental Rating	**Renewable energy and carbon emission reductions**
Planning Application stage	CfSH*/BREEAM** pre-assessment report	Initial design SAP***/SBEM**** calculation, technical details of proposed system(s), saving calculation following approved method summarised in an Energy Statement.
Pre-commencement	CfSH*/BREEAM** design assessment calculation and report	Final design SAP***/SBEM**** calculation, technical details of proposed system(s), saving calculation following approved method summarised in an Energy Statement.
Post-completion	CfSH/BREEAM Post-construction assessment calculation and report	As-built SAP/SBEM calculation and technical details of system(s) installed, CO_2 saving calculation following approved method
Prior to occupation	Final CfSH/BREAAM certificate	
* CfSH is the Code for Sustainable Homes. ** BREEAM is the Building Research Establishment Environmental Assessment Method. *** SAP is the Standard Assessment Procedure for Part L1 compliance with the Building Regulations 2010, which concerns domestic buildings. **** SBEM is the Simplified Building Energy Method for Part L2 (non-domestic) compliance with the Building Regulations (2010) which concerns non-domestic buildings.		

If the developer/applicant does not comply with the required BREEAM or Code level ratings, or where a development is unable to comply with the requirements set out in planning policy due to technical and financial feasibility, an independent external consultant will be instructed by the Council for an impartial view on the BREEAM/Code assessment. The independent assessor is payable by the applicant prior to the assessment being carried out. The onus will be on developers to pay for any cost of independent assessment.

Further information or **supporting evidence** to be submitted may also include (depending upon the nature of the site):

- Biomass boiler information sheet[1]
- Lighting pollution report
- Travel plan or Transport statement
- Ecology report
- Tree report
- Flood risk assessment
- Site contamination remediation plan

Some of these reports need to be completed by an independent specialist. It should be noted that the majority of sites (particularly of small development scale) may not need to complete all of these additional reports, but please read the Checklist to determine applicability to a given site. When submitted, these reports will be reviewed following the standard planning application procedures, which can involve review by experts as appropriate.

3 Scoring process

The overall score for the Checklist will reflect the positive contribution which the development has made towards incorporating sustainability measures. A rating is provided for the score in order to indicate the overall performance of the development.

The Checklist will be read as a whole with the score, and will form an element of material weight in the planning application. Whilst the Checklist endeavours to be applicable to as many development types as possible, it is recognised that not all the measures included will be appropriate for all types of development. This will be taken into account when reviewing the responses and the final score achieved. If a site has scored poorly overall, justification in the relevant areas will need to be provided. Comment space is provided for this and any additional relevant information.

It should be noted that the Checklist score will not replace any requirement for mandatory achievement in other areas of the planning application, e.g. flood risk prevention, Lifetime Homes Standard. The score is intended as a measure of 'additional' sustainability performance beyond a minimum compliance level, and achievements under it will be considered in this light.

Checklist areas which developers state they will comply with shall be enforced by planning condition.

[1] Available from: http://www.richmond.gov.uk/biomass_boilers

4 Financial benefits of sustainable design and construction

The specific environmental benefits of the measures included in the Checklist are discussed in the justification and further information sections below, however the financial benefits also provide a key consideration in choosing to build more sustainably.

In terms of initial build cost, designing with an aim of creating an energy efficient building can make it easier and cheaper to meet increasingly stringent Building Regulations targets under Part L. Adopting a best practice approach to energy efficiency will help those involved in construction stay ahead of the game for meeting these targets as they continue to tighten, as well as allowing designers to develop means of meeting these targets more cost-effectively.

Energy efficiency measures will translate directly into lower fuel bills for residents and occupiers. With fuel prices expected to rise in the coming years, those enjoying the benefits of low fuel bills will have their costs future-proofed against these price rises, helping to maintain income levels.

Reducing water consumption will also translate directly into lower water (and fuel) bills for residents and occupiers. The Mayor's aim for London is to have water meters installed in all houses by 2015 and in flats by 2020. Improved awareness of water consumption will help occupiers to proactively reduce their usage and associated bills.

It is often more difficult and expensive to provide energy efficiency improvements to existing buildings. By incorporating these measures into current developments, we will create a building stock that will have a significantly reduced need of refurbishment and retrofit, and thus improve the lifetime of our buildings.

Retrofitting existing buildings to improve their performance offers the opportunity to reduce CO_2 emissions and to adapt existing buildings to a changing climate, all of which will translate directly into lower utility bills. Works to prevent flood water entering a building or which will reduce the time and cost of recovering from a flood will significantly reduce the damage, cost and time of repair if properties are flooded. Guidance on retrofitting, case studies, retrofitting measures as well as their costs and cost benefits, can be found in "Your Home in a Changing Climate" (February 2008).

Research suggests that improvements in indoor air quality resulting from sustainable building techniques and the use of better materials, improves health of residents and workers, corresponding to increased productivity[2].

By stimulating the market in sustainable construction products, we also contribute towards developing the market in these products, establishing supply chains into the borough with better quality goods, higher standards of certification and lower costs for developers.

[2] BRE (2010). *Indoor air quality: Assessment and evaluation of indoor air quality*. [Online]. Available from: http://www.bre.co.uk/page.jsp?id=720 [Accessed 11.05.10]

5 Guidance

Guidance for completing the Checklist is available in the section below (Further support / information). This section on further information sets out support and guidance for each area of the Checklist.

The relevant policy guidance for the Checklist can be found in section 6 of this document.

If you have additional questions on the Sustainable Construction Checklist, you can contact the Planning Policy team at Ldf@richmond.gov.uk.

Checklist Section	Further support / information
Minimum policy compliance section	
Environmental Rating: Code for Sustainable Homes	The Code is the national standard for the sustainable design and construction of new homes. The Code aims to reduce carbon emissions and create homes that are more sustainable. To gain a rating under the Code, various credits must be achieved in a range of credit areas, from energy performance to pollution and construction management. The first step of assessment involves preparation of a preliminary assessment by an accredited and licensed Code assessor, who will be able to advise on a suitable strategy to meet the desired Code rating. This report should be submitted as part of the planning application. After planning permission is granted, the accredited Code assessor will conduct a full Design stage assessment, and the process is finalized with a Post-Construction assessment, after which the BRE certification body will issue a certificate confirming the Code level has been attained. A full list of all certified Code for Sustainable Homes assessors is available from the Green Book Live: http://www.greenbooklive.com/search/search.jsp?sectionid=10057&partid=10001
Environmental Rating: BREEAM / EcoHomes	The BRE Environmental Assessment Method (BREEAM) is the leading and most widely used environmental assessment method for buildings. It has become the de facto measure used to describe a non-residential building's environmental performance. Follow the link below for additional information: http://www.breeam.org/page.jsp?id=66 To gain a rating under BREEAM, various credits must be achieved in a range of credit areas, from energy performance to pollution and building management. The first step of assessment involves preparation of a preliminary assessment by an accredited and licensed BREEAM assessor, who will be able to advise on a suitable strategy to meet the desired BREEAM rating. This report should be submitted as part of the planning application. After planning permission is granted, the accredited BREEAM assessor will conduct a full Design stage assessment, which is reviewed by the BRE. Following construction a Post-Construction assessment is conducted, after which the BRE certification body will issue a certificate confirming the BREEAM level has been attained. An optional post-occupancy certification stage is available, which will review management practices and operation of the building in comparison to the predicted rating. EcoHomes is a version of BREEAM for homes, which is expected to be replaced in due course by an updated system entitled the BREEAM Domestic Refurbishment rating. Planning applications will be required to demonstrate achievement of the standard relevant at the time of application. These rating systems provide an authoritative rating for converted or renovated homes, and covers houses, flats and apartments. It is only available for conversions or extensions where a significant level of change is proposed; please contact a licensed assessor to check whether or not your proposed development falls into this category. http://www.breeam.org/page.jsp?id=21
Accredited Assessors	Code for Sustainable Homes, EcoHomes and BREEAM assessments and certifications must be carried out by a licensed Code for Sustainable Homes, EcoHomes and BREEAM Accredited Assessor respectively. It is important to ensure that the assessor is accredited by a scheme that has been approved by the Department for Communities and Local Government (CLG), currently BRE Global Ltd and Stroma Accreditation Ltd (the latter are only approved for the CfSH accreditation and not BREEAM). A full list of all accredited BREEAM, Code for Sustainable Homes and EcoHomes assessors is available from the BRE's Green Book Live: http://www.greenbooklive.com/search/index.jsp.

Checklist Section	Further support / information
Energy Assessments	Richmond Council Developers Guidance for Energy Statements can be found in Section 7 of this document. The Greater London Authority provides further detail on addressing the London Plan's energy hierarchy through the provision of an energy assessment to accompany strategic planning applications. The purpose of an energy assessment is to demonstrate that climate change mitigation measures are appropriate for the development and integral to the scheme's design and evolution. For additional information, follow the link below: http://www.london.gov.uk/sites/default/files/guidance-energy-assessments-28-sep-10.pdf
Carbon dioxide emissions reduction	LBRUT ask that all developments seeking to reduce CO_2 emissions follow the Mayor of London's 'Energy Hierarchy', which first focuses on reduction in energy demand through energy efficiency measures, then on 'clean' energy supply through heat networks or community heating where appropriate, and finally considers applicability of renewable energy supply to the site. (Further details on this are available in the guidance for Section 1 below.) This is to ensure that developments are designed for energy efficiency as far as possible before renewable energy is considered. The reduction in total site CO_2 emissions must be calculated using an energy baseline which includes both 'regulated' energy (for space and hot water heating, electricity for lighting and all other fixed items) and 'un-regulated energy' (covering the use of energy for cooking and all appliances). For residential developments, site specific SAP calculations should be used to estimate regulated energy consumption and CO_2 emissions. Non-regulated emissions should be estimated using accepted methodologies such as the Code for Sustainable Homes ENE7 calculator (available from the BRE) or BREDEM-12 (available from the BRE). These calculations should be included with the planning application. For non-residential developments, SBEM should be used to estimate regulated energy consumption and CO_2 emissions, which should be included with the planning application. Non-regulated emissions should be estimated using CIBSE Guide F benchmarks (available from CIBSE and also from the commercial benchmarks contained in the LEP's Low Carbon Designer tool), or the most recent CIBSE benchmark data where available. The CO_2 emissions associated with the total energy consumed by a development should then be reduced following the Mayor's hierarchy. Energy savings from efficiency measures and clean supply should be calculated to produce an 'energy efficient' baseline for the site. The % savings made through the installation of renewable energy on site should then be calculated from this 'efficient' baseline, and this figure should be provided in the checklist. The "% of regulated CO_2 emissions saved below Building Regulations target level through all low carbon measures" figure requested in the checklist can be obtained by calculating the difference between the dwelling emissions rate (DER) and the target emissions rate (TER) for the building. The DER is the predicted total regulated kg CO_2 emissions per m^2 of a development after incorporation of energy efficiency measures, energy efficient supply and renewable energy. The TER is the maximum total regulated emissions in $kgCO_2/m^2$ permitted under Part L of the Building Regulations for that development. Both these figures are calculated using SAP. For further details on these procedures and how to calculate emissions reductions, please see the Richmond Guidance on producing an energy statement in section 7 of this document.

Checklist Section	Further support / information
	Section 1: Energy use and pollution
Need for cooling	**Use less energy** The first step in the Mayor's 'Energy Hierarchy' requests that buildings be designed to use improved energy efficiency measures. This will reduce demand for heating, cooling, and lighting, and therefore reduce operational costs while also minimizing associated carbon dioxide emissions. The Energy Saving Trust (EST) has produced a best practice guide on passive solar estate layout. The EST web site also provides a link to the Farrans Study on passive solar house design: http://www.est.org.uk/housingbuildings/publications/index.cfm?mode=listing&pub_id=579#pub579 http://www.est.org.uk/housingbuildings/publications/index.cfm?mode=listing&pub_id=265#pub265 A number of *guides have been produced on ventilation and cooling*: • Good Practice Guide 290. Ventilation and cooling options appraisal. A client guide. • Good Practice Guide 291. A designers' guide to the options for ventilation and cooling; http://www.nea.org.uk/publication-list/ • Natural ventilation in non-domestic buildings. Application Manual AM10: CIBSE 1997; http://www.cibse.org There are large number of organisations / programmes providing impartial support in the field of energy efficiency: • Practical Help support programme – http://www.energysavingtrust.org.uk/business/Business/Local-Authorities A free enquiry service providing up to 2 hours support (per enquiry) for local authorities and housing associations offering realistic solutions for promoting and implementing sustainable energy policies and measures to reduce carbon dioxide. Also provide referral service to other EST programmes. • The Energy Efficiency Best Practice in Housing programme: http://www.energysavingtrust.org.uk/business/Business/Housing-professionals Provided by the Energy Saving Trust, this is the Government's principal energy efficiency information, advice and research programme for professional organisations involved in all aspects of housing • Carbon Trust Design Advice – www.thecarbontrust.co.uk Sustainable energy design advice for major developments. Subject to an approved application, clients are offered a free initial design consultancy on a building project. Further consultancy, with partial funding, may be available.
Heat generation	The second stage in the Mayor's 'Energy Hierarchy' is to ensure efficient and low carbon energy supply. In particular, this concerns provision of decentralised energy where practical and appropriate. The Mayor of London with the London Development Agency are working with London boroughs to establish decentralised energy policies and bring forward public sector heat loads for investment and delivery. http://www.london.gov.uk/sites/default/files/powering-ahead141009.pdf An overview of various decentralised renewable energy generation technologies and associated funding schemes can be found at:

Checklist Section	Further support / information
	http://www.energysavingtrust.org.uk/Generate-your-own-energy There is limited opportunity for decentralised supply in LBRUT, however it is considered that major developments with high and constant heat demand, particularly those for hospitals, colleges, or incorporating swimming pools, should consider the use of CHP or decentralised energy supply technologies. Generating energy from renewable energy sources is considered the final step in the Mayor's 'Energy Hierarchy', and will enable developments to generate energy to meet their own demands. This should be considered after efficiency measures and low carbon energy supply from a network, to ensure that the best practice measures are incorporated into the development.
Pollution: Air, Noise and Light	Measures to reduce pollution during the construction process can often be simple to implement but have significant wider benefit. Such measures include: reducing waste during demolition and construction, thereby reducing landfill costs; ensuring air pollution monitoring is carried out; disturbing topsoil as little as possible, to maintain soil quality; protect trees and vegetation; protect waterside zones; and, use pollution prevention techniques (see Environment Agency's Pollution Prevention Guideline 6: Working at construction and demolition sites). The *Considerate Constructors* initiative, started in 1997, is a voluntary Code of Considerate Practice, which is adopted by participating construction companies, and everyone involved on the construction site. The scheme promotes competent management, efficiency, awareness of local environmental issues and above all neighbourliness during the construction process. http://www.considerateconstructorsscheme.org.uk/ CIRIA (Construction Industry Research and Information Association) has published a seminar entitled *Biodiversity and Construction: working with wildlife (E3217)*. The seminar examines ways in which construction clients and their project teams can improve and monitor project performance in relation to ecological impacts and biodiversity. Case studies and benefits of implementing good practice are also highlighted. http://www.ciria.org.uk
Pollution: Air, Noise and Light	Overriding policy on protecting noise and soundscapes is found in Planning Policy Guidance 24: Planning and Noise: http://www.communities.gov.uk/publications/planningandbuilding/ppg24 The Code of Practice for BS 8233 1999- Sound Insulation and Noise Reduction for Buildings - Code of Practice, can be found through the link below: http://www.standardsdirect.org/standards/standards5/StandardsCatalogue24_view_7343.html This should be read with regard to Part E of the Building Regulations, which covers sound insulation for buildings. The Building Research Establishment (BRE) provides guidance entitled Sound control for homes from: http://www.brebookshop.com/details.jsp?id=534 The Institute of Acoustics also has further information on improving soundscapes: http://www.ioa.org.uk/ Please also see Richmond Council's Draft Guidance Note: *Information for Applicants Design Criteria for Noise Generating and Noise Sensitive Development*

Checklist Section	Further support / information
2. Transport	
Provision for the safe, efficient and sustainable movement of people and goods	Richmond's Smarter Travel webpage contains information about public transport within the Borough: http://www.smartertravelrichmond.org/ . Transport For London also have comprehensive travel advice for travel within Greater London, available from: http://www.tfl.gov.uk/ This should include provision of suitable levels of cycle storage for residents/building users. Considerations for designing cycle storage should include security, weatherproofing and access. For Smarter Travel in Richmond cycle guides, and how to order cycle maps: http://www.smartertravelrichmond.org/Cycling/Home.aspx For maps of walking routes: http://www.walkit.com/london/ Information on the Government's strategy for electric vehicles and their associated charging infrastructure can be found at the Office for Low Emission Vehicles website http://www.dft.gov.uk/topics/sustainable/olev/, along with the latest strategy "Making the Connection:The Plug-in Vehicle Infrastructure Strategy". Information on electric vehicles and charging points in London can be found at https://www.sourcelondon.net/
3. Biodiversity	
Minimising the threat to biodiversity from new buildings, lighting, hard surfacing and people	Ensure there is no net loss of ecological features or habitats and aim to achieve a net gain of biodiversity features and habitats where possible. Aim to link existing and new biodiversity features and habitats into the wider green infrastructure network, and ensure that their adaptability to climate change is taken into account. For information on designing development with regard to protecting and enhancing site biodiversity, the UK Green Building Council information centre has a variety of resources: http://www.ukgbc.org/site/info-centre For up to date, comprehensive information and advice about green roofs, visit *Livingroofs.org* a non-profit organisation established to promote, advise upon and seek research into green roofs and similar structures within the context of urban and rural regeneration. http://www.livingroofs.org/ Living roofs, also known as green roofs can be characterised as extensive, semi-intensive or intensive, depending on the depth of planting medium and the amount of maintenance they need: 1) Extensive green roofs have little load bearing capacity, low growing plant communities, such as sedums, with no access other than or occasional maintenance; extensive roof types are intended to be self-sustaining. They are generally less costly to install than intensive green roofs. 2) Semi-intensive green roofs fall in between extensive and intensive green roof systems. More maintenance, higher costs and more weight are the characteristics compared to an extensive green roof. 3) Intensive planted roofs have a greater depth of growing medium, suitable for a wide range of planting, including trees and shrubs, and require extra loading requirements within the holding structure. They are often referred to as "roof gardens" and require maintenance and irrigation similar to gardens.

Checklist Section	Further support / information
4. Flooding and drainage	
Is your site located in a high risk flood zone?	A Flood Risk Assessment will be required for all developments, including extensions and conversions, in areas at risk from flooding (this also includes other sources of flooding, not just river flooding), and for sites greater than 1 hectare in low risk areas (zone 1). Please refer to PPS25, local planning policies and the Council's Strategic Flood Risk Assessment to determine if and to what level of detail a Flood Risk Assessment is required. In particular, the Council's guidance on flood risk (http://www.richmond.gov.uk/home/environment/planning/flood_risk.htm) and Good Practice Case Studies summarize the relevant concerns and provide design guidance. The Environment Agency flood map (http://www.environment-agency.gov.uk/homeandleisure/37837.aspx) will allow you to figure out the risk of flooding for the development, proximity to likely sources of flooding and includes guidance for what to do in high flood zone. The Council has also adopted a Strategic Flood Risk Assessment, which identifies areas in the borough at risk from flooding from the River Thames, its tributaries and other sources. The following guides provide information on flood resilience and resistance: • Improving the flood performance of new Buildings – Flood resilient construction Department for Communities and Local Government, RIBA Publishing, May 2007. • Suppliers and manufacturers of flood defence products - 'Blue Pages' publication by the National Flood Forum: http://www.bluepages.org.uk/ • Flood protection products and preparing your home or business for flooding - Environment Agency website • Your Home in a Changing Climate, Three Regions Climate Change Group, February 2008 The London Climate Change Partnership, the South East Climate Change Partnership and the East of England's Sustainable Development Roundtable have produced *Adapting to Climate Change: A Checklist for Development*, which suggests ways for developers and their design teams to modify building designs to cope with the weather changes associated with global warming and climate change. An electronic copy of the guidance can be downloaded from Climate South East. Developers should note that flooding could also occur away from the floodplain as a result of development where off site infrastructure is not in place ahead of development (also see section on Water Conservation below). Therefore, Flood Risk Assessments are required to take account of all sources of flooding. If the site is within 20 metres of a watercourse or a flood defence, the developer should seek opportunities to open up culverts, naturalise river channels or enhance the watercourse. There should be an undeveloped buffer zone from the top of bank of the watercourse. The creation of new floodplain and restoration of the natural floodplain to its original function and/or protect the existing floodplain is encouraged. The integrity of any flood defences must be protected at all times.

Checklist Section	Further support / information
Sustainable drainage and measures to mitigate surface water flooding risk	The CIRIA SUDS web site has been established to disseminate and promote good practice in the implementation of sustainable drainage in the built environment: http://www.ciria.org/suds/ Specific CIRIA documents in relation to SUDS: - The SUDs manual (C697), CIRIA, February 2007. - The use of SUDs in high density development – Guidance manual (SR666), Kellagher R, HR Wallingford, 2005. The *Environment Agency* web site provides comprehensive information on Sustainable Urban Drainage Systems (SUDS) including: • Details of the various techniques used in SUDS drainage • Details of key groups involved in SUDS • Information on research currently being undertaken in the field • Links to relevant web sites http://www.environment-agency.gov.uk For up to date, comprehensive information and advice about green roofs, visit *Livingroofs.org* a non-profit organisation established to promote, advise upon and seek research into green roofs and similar structures within the context of urban and rural regeneration: http://www.livingroofs.org/ Refer to PPS25: Development and Flood Risk – section on areas at risk from flooding other than from river and sea.
5. Improving Resource Efficiency	
Re-use and recycling of construction materials	The Government's *Waste Strategy for England 2007* identifies the good potential to increase resource efficiency in construction and reduce waste. Additional information is available via the links below: http://www.defra.gov.uk/environment/waste/topics/construction/index.htm#scs http://www.berr.gov.uk/whatwedo/sectors/construction/sustainability/page13691.html It is a legal requirement to include a Site Waste Management Plan pre-commencement. Guidance on producing a Site Waste Management Plan including a template can be found on this website: http://www.wrap.org.uk/construction/tools_and_guidance/site_waste_management_planning/index.html

Checklist Section	Further support / information
Site on contaminated land	The DETR Circular 2/2000 Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990 gives statutory guidance on the new regime for the treatment of contaminated land, as set out in Part IIA of the Environmental Protection Act 1990. Please see Table 2.1: Examples of Potentially Contaminating Uses of Land and Situations Where Land may be Affected by Contamination, within Planning Policy Statement 23: Planning and Pollution Control, Annex 2: Development on Land Affected by Contamination when assessing whether the site's history includes any potentially contaminating uses. http://www.communities.gov.uk/documents/planningandbuilding/pdf/pps2annex2.pdf The *DEFRA (2004), Model Procedures for the Management of Land Contamination* provides a technical framework for applying a risk management process when dealing with land affected by contamination: http://www.environment-agency.gov.uk The following web sites provide information on contaminated land policy and remediation: http://www.ciria.org http://www.defra.gov.uk http://www.environment-agency.gov.uk http://www.iema.org.uk www.claire.co.uk
Composting	Composting food and organic waste on site can not only reduce the amount of waste sent to landfill, and harmful greenhouse gases produced as a result, but also provides free fertilizer for garden spaces. More information on setting up composting is available from: http://www.recyclenow.com/ or http://www.richmond.gov.uk/home/environment/rubbish_waste_and_recycling/recycling_in_the_garden/composting.htm If there is no scope for setting up composting on site, then your development may be eligible to join LBRuT's food or garden waste collection schemes. Please see the website for more details: http://www.richmond.gov.uk/home/environment/rubbish_waste_and_recycling/household_recycling.htm If a development is going to have an area dedicated to composting, an exemption from environmental permitting or an Environmental Permit may be required from the Environment Agency. This will be dependant on the quantity of compost to be stored or treated at any one time. Please see the Environment Agency website: http://www.environment-agency.gov.uk/business/topics/permitting/116273.aspx and http://www.environment-agency.gov.uk/business/topics/permitting/117226.aspx
Water Conservation	Despite the perception of the UK as a wet country, water is a resource which needs to be carefully managed to ensure that the needs of our growing population are met (http://www.environment-agency.gov.uk/homeandleisure/beinggreen/117266.aspx). This is particularly crucial in the face of climate change, with hotter drier summers likely to put increased pressure on water resources. Water saving measures can be applied to almost every aspect of domestic or standard water use. For example, low flush or dual flush toilets provide 'low volume' flush options, taps and shower heads are available in 'aerated' or low flow spray options which reduce water consumption without compromising water pressure.

Checklist Section	Further support / information
	If a property is being retrofitted and it is not possible to replace such items, water hippos can be used to reduce the volume of a toilet tank flush, or flow restrictors can be fitted to taps to limit standard water use. Information on simple water saving measures is available from the Energy Saving Trust: http://www.energysavingtrust.org.uk/Water/Water-and-carbon-the-facts. For refurbishment and conversions in particular, further information and starter packs may be available from the local water company, depending on your location and development type. Further water saving measures may include harvesting rainwater to serve internal water consumption, for example toilet flushing or for use in washing machines. Greywater systems which re-use water within a building, for example using shower water to flush toilets, may also be used to conserve water. For developments with garden space or planting, rainwater harvesting for use in irrigation can also help to conserve water, as would choosing planting that has minimal water requirements. Further information is available from: http://www.rhs.org.uk/climate/advice/drought.asp *Envirowise* offers UK businesses free, independent, confidential advice and support on practical ways to increase profits, minimise waste and reduce environmental impact, including advice on water saving: http://www.envirowise.gov.uk/ Certain water saving devices are eligible for Enhanced Capital Allowance (ECA): http://www.eca.gov.uk/ For further information about rainwater harvesting and grey water recycling visit the *Environment Agency* web site: http://www.environment-agency.gov.uk Guidance of water efficiency/conservation can be obtained from the Environment Agency National Water Demand Management Centre (www.environment-agency.gov.uk) of Thames Water (http://www.thameswater.co.uk/cps/rde/xchg/corp/hs.xsl/3784.htm) The target of 105 litres per person per day within the Checklist should be achieved as a preference to the Building Regulations 2010 Part G, which limits domestic water consumption to 125 litres per person per day: http://www.planningportal.gov.uk/england/professionals/buildingregs/technicalguidance/bchygienepartg/bcapproveddocuments5 Water Supply & Sewerage Infrastructure: It is essential that developers demonstrate that adequate water supply and sewerage infrastructure capacity exists both on and off the site to serve the development and that it would not lead to problems for existing users. Developers will be required to provide evidence that capacity exists in the public sewerage and water supply network to serve their development. Developers should contact Thames Water with this regard. Further information for developers on water and sewerage infrastructure can be found on Thames Water's website at: http://www.thameswater.co.uk/cps/rde/xchg/corp/hs.xsl/558.htm Or contact can be made with Thames Water Developer Services by post at: Thames Water Developer Services, Reading Mailroom, Rose Kiln Court, Rose Kiln Lane, Reading RG2 0BY; by telephone on: 0845 850 2777; or by email: developer.services@thameswater.co.uk

Checklist Section	Further support / information
6. Design Standards and Accessibility	
Ensure flexible and adaptable use of long term structures	Lifetime Homes are ordinary homes incorporating 16 Lifetime Home Standard Design Criteria that can be universally applied to new homes at minimal cost: http://www.lifetimehomes.org.uk/ Wheelchair standards are enhanced to make specific provision for wheelchair users with additional spatial requirements. The wheelchair housing should be clearly shown on plans, and the requirements of the Design for Maximum Access SPG or Wheelchair Housing Design (Habinteg, Thorpe S., 2006) will need to be taken into account. Richmond Council's Design for Maximum Access SPG also provides additional information for accessibility to non-residential developments: http://www.richmond.gov.uk/design_for_maximum_access.pdf There should be reference to how the criteria have been addressed. Particular standards that affect plans and elevations include door widths, level access, turning circles, window heights, and adaptability for future lift provision. This should be read in conjunction with guidance on Design & Access Statements. The Residential Development Standards SPD sets out internal and external space standards to promote high quality sustainable design. This includes net internal floor areas for different rooms and units sizes.

6 Planning policies

The following documents set out the planning policies relevant for the Sustainable Construction Checklist SPD:

- Richmond Core Strategy (April 2009)
- Richmond Development Management Plan (DMP) (emerging, 2011)
- London Plan, Consolidated with Alterations since 2004 (February 2008)
- London Plan (emerging replacement plan, October 2009)

As some of the policy documents are emerging and may be updated, including those produced by the Council and London-wide, this section will be updated separately to signpost other relevant guidance.

Minimum Policy Compliance
Environmental rating:

- Richmond Core Strategy CP1 Sustainable Development
- Richmond DMP Policy DM SD 1 Sustainable Construction
- Richmond DMP Policy DM SD 2 Renewable Energy and Decentralised Energy Networks
- London Plan (LP) Policy 4A.3 Sustainable design and construction

Energy Assessment:

- London Plan Policy 4A.4 Energy assessment

Carbon Dioxide emissions reduction:

- Richmond Core Strategy CP2 Reducing Carbon Emissions
- Richmond DMP Policy DM SD 1 Sustainable Construction
- Richmond DMP Policy DM SD 2 Renewable Energy and Decentralised Energy Networks
- LP Policy 4A.3 Sustainable design and construction
- LP Policy 4A.5 Provision of heating and cooling networks
- LP Policy 4A.6 Decentralised Energy: Heating, Cooling and Power
- LP Policy 4A.7 Renewable Energy
- LP Policy 4A.8 Hydrogen Economy

1. Energy Use and Pollution
Need for Cooling:

- Richmond Core Strategy CP1 Sustainable Development
- Richmond Core Strategy CP2 Reducing Carbon Emissions
- Richmond DMP Policy DM SD 4 Adapting to Higher Temperatures and Need for Cooling
- Richmond DMP Policy DM SD 5 Living Roofs
- LP Policy 4A.3 Sustainable design and construction

- LP Policy 4A.6 Decentralised Energy: Heating, Cooling and Power
- LP Policy 4A.9 Adaptation to Climate Change
- LP Policy 4A.10 Overheating
- LP Policy 4A.11 Living Roofs and Walls
- Draft London Plan Policies 5.2 Minimising carbon dioxide emissions; 5.5 Decentralised energy networks; 5.7 Renewable energy; 5.9 Overheating and cooling

Pollution: Air, Noise and Light:

- Richmond Core Strategy CP1 Sustainable Development
- LP Policy 4A.17 Water Quality
- LP Policy 4A.19 Improving air quality
- LP Policy 4A.20 Reducing noise and enhancing soundscapes
- LP Policy 4A.29 Hazardous waste
- London Air Quality Strategy
- Planning Policy Guidance 24: Planning and Noise

2. Transport

Provision for the safe efficient and sustainable movement of people and goods

- Richmond Core Strategy CP5 Sustainable Travel
- LP Policy 4A.19 Improving air quality
- London Air Quality Strategy
- Draft London Plan Policies: 5.8 Innovative energy technologies; 6.2 Providing public transport capacity and safeguarding land for transport; 6.3 Assessing transport capacity; 6.10 Walking; 6.11 Smoothing traffic flow and tackling congestion

3. Biodiversity

Minimising the threat to biodiversity from new buildings, lighting, hard surfacing and people

- Richmond Core Strategy CP4 Biodiversity
- Richmond DMP Policy DM SD 5 Living Roofs
- LP Policy 4A.3 Sustainable design and construction
- LP Policy 4A.11 Living roofs and walls

4. Flooding and Drainage

Mitigating the risks of flooding and other impacts of climate change in the borough

- Richmond Core Strategy CP3 Climate change – Adapting to the effects
- Richmond DMP Policy DM SD 6 Flood Risk
- Richmond DMP Policy DM SD 7 Sustainable Drainage
- LP Policy 4A.12 Flooding
- LP Policy 4A.13 Flood Risk Management
- LP Policy 4A.14 Sustainable Drainage
- Draft London Plan Policy 5.13 Sustainable Drainage

5. Improving Resource Efficiency

Reduce waste generated and amount disposed of by landfill though increasing level of re-use and recycling

- Richmond Core Strategy CP1 Sustainable Development
- Richmond Core Strategy CP6 Waste
- LP Policy 4A.3 Sustainable design and construction
- LP Policy 4A.30 Better use of aggregates
- LP Policy 4A.33 Bringing contaminated land into beneficial use
- Draft London Plan Policy 5.15 Water use and supplies

6. Design Standards and Accessibility

Ensure flexible adaptable and long-term use of structures

- Richmond Core Strategy 15 Affordable Housing
- London Plan Policy 3A.5 Housing Choice
- Wheelchair Housing Design (Habinteg, Thorpe S., 2006),
- Residential Development Standards SPD (2010)
- Richmond Design for Maximum Access SPG

7 Energy Statement Guidelines for Developers

When is an Energy Statement needed?
As of 1 January 2009, the Council expects all schemes including 1 or more residential units, and commercial or other developments of 100m2 or more to design for minimum energy use and reduce predicted site CO_2 emissions, which should be addressed in an Energy Statement. An Energy Statement should therefore be provided for all new developments that meet the relevant thresholds, and should be submitted to the Planning Office with the full planning application.

What should an Energy Statement include?
The statement should provide an assessment of the predicted energy demand and carbon dioxide emissions for the site and how these have been reduced in accordance with the energy hierarchy by: 1. Using less energy, 2. Supplying energy efficiently, 3. Using renewable energy, with using less energy having the highest priority.

The following information should be included:

1. Baseline energy consumption, which should include both regulated and non-regulated[3] energy use.

- Regulated energy consumption should be calculated using the Government's Standard Assessment Procedure (SAP) for residential developments, or the Simplified Building Energy Model (SBEM) for non-residential development.
- Non-regulated energy consumption should be calculated using the Code for Sustainable Homes Ene 7 calculator or the BREDEM-12 tool for residential developments. For non-residential developments, non-regulated energy should be estimated using CIBSE Guide F benchmarks or an updated version of this guidance if available.

2. Baseline carbon dioxide (CO_2) emissions, calculated using standard conversion factors[4].

- This should be total development emissions, including both regulated and non-regulated emissions.
- The baseline should include emissions from gas and electrical
- energy consumption
- Emissions associated with water and space heating should be calculated from a gas baseline, unless an electrical baseline can be justified

[3]Regulated energy consumption includes those forms of energy use covered in Building Regulations. This includes all fixed consumption inherent in the building, e.g. fixed lighting, space heating, water heating. Non-regulated energy consumptions are those energy uses not covered by Building Regulations. This includes energy consumed by 'plug-in' appliances (e.g. lamps, TVs) and cooking.

[4]Available from Building Regulations Part L2a (2010) Table 2. These include:
Natural gas: 0.198kgCO_2/kWh
Electricity: 0.517kgCO_2/kWh
Electricity from on-site renewable energy (e.g. from solar photovoltaics): 0.529kgCO_2/kWh

3. Reductions in energy consumption and carbon dioxide emissions resulting from energy efficiency measures. These measures should be considered before renewable energy installations in order to reduce the expected energy consumption of the development and consequently make it as energy efficient as possible.

- Provide details of the energy efficiency measures that will be incorporated into the development.
- Where available, specific details, such as building material U values, ratings of electrical appliances, etc should be included.

4. Reductions in energy consumption and carbon dioxide emissions resulting from supplying energy efficiently.

- Illustrate in the proposal how the use of Combined Heat and Power (CHP) technology or a community / district heating scheme or centralised heating system has been explored, and if feasible the expected CO_2 emissions reductions this will deliver.
- This may not be applicable to all sites. If it is not applicable, give the reason why this consideration has been excluded.

5. Estimation of CO_2 reduction through use of renewable energy technologies[5]. This should at least meet the minimum % reduction from the efficient energy baseline required by LBRuT.

- The required % emissions reduction should be calculated as a reduction from the efficient baseline emissions level calculated in step 4 (or calculated from the baseline in step 3, if step 4 is not applicable).
- For each technology deemed to be suitable for the site, a CO_2 reduction estimate should be presented. This should include as a minimum: Proposed system size; estimated energy generation; estimated CO_2 savings; site-specific design requirements; maintenance requirements; estimated lifecycle.
- Where a technology has been ruled out, clear justification outlining the technical reasons for this should be provided
- The location of any renewable or low carbon energy technologies should be shown in design plans: e.g. proposed location of solar panels on roof; location of plant room for communal heating system etc.
- Example formats for simple tables containing the necessary energy and CO_2 offset data are given below. These may be used to summarise the information contained in your Energy Statement.

6. A concluding section should be provided outlining the contribution of each set of measures, technology or combination of technologies towards meeting the relevant target and providing recommendations as to which would be more suitable for the site. Where it has not been possible to reach the target, a clear explanation should be provided.

[5] These are technologies that provide energy derived from a source that is continually replenished, such as wind, wave, solar, hydroelectric and energy from plant material, but not fossil fuels or nuclear energy. Although not strictly renewable, geothermal energy and energy from heat gradients is also included.

Notes on presentation

An Energy Statement should present technical data while remaining easy to read and to understand. Clearly laid out tables should be used to present data for ease of reading and comparison. Site plans should be used where possible, e.g. to indicate suitable roof areas for installing solar technologies or the location of a plant room. References should be used to explain where data has been obtained from.

Example Tables

1. Summary of baseline energy demand.

This table may be amended or duplicated to show energy demand before and after the application of energy efficiency measures or renewable energy technologies.

	Total Energy Demand (kWh/yr)	Associated Total CO2 (kgCO2/yr)
Hot water		
Space Heating		
Fixed Electrical		
Appliances/Non-regulated		
… (any other energy consumption)		
TOTAL		

2. Summary of CO_2 emissions reductions

	Total CO2 emissions (kgCO2/year)
Baseline emissions	
Improved emissions (after application of energy efficiency measures)	
Improved emissions (after incorporation of efficient energy supply)	
Improved emissions (after incorporation of renewable energy technology)	
% CO2 displaced in total	
% CO2 displaced by energy efficiency measures	
% CO2 displaced by efficient supply of energy	
% CO2 displaced by renewable energy	

8 Abbreviations

BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
CfSH	Code for Sustainable Homes
CIBSE	Chartered Institute of Building Services Engineers
CIRIA	Construction Industry Research and Information Association
CHP	Combined Heat and Power [generator]
DEFRA	Department for Environment, Food and Rural Affairs
DTLR	Department for Transport, Local Government and the Regions
ECA	Enhanced Capital Alliance
EST	Energy Saving Trust
GLA	Greater London Authority
LBRuT	London Borough Richmond upon Thames
LDA	London Development Agency
SAP	Standard Assessment Procedure
SBEM	Simplified Building Energy Method
SUDS	Sustainable urban drainage systems
SPD	Supplementary planning document
SPG	Supplementary planning guidance

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FURTHER INFORMATION

Planning Policy and Guidance

Detailed information is contained in other supplementary guidance and leaflets, available from www.richmond.gov.uk/planning_guidance_and_policies.htm

Borough-wide policies and guidance

- Core Strategy
- Development Management DPD (emerging)
- Design Quality SPD
- Small and Medium Housing Sites SPD
- Sustainable Construction Checklist SPD
- Advice for Householders: Sustainable Development
- Front Garden and Off Street Parking Standards SPD

London-wide policies and guidance

- London Plan (Mayor of London, replacement plan emerging)
- Accessible London SPG (Mayor of London)
- Providing children's and young people's play and informal recreation SPG (Mayor of London)
- London Housing Design Guide (Mayor of London, emerging)

Development Control (Planning application advice)

www.richmond.gov.uk/planning_applications_residential.htm
Email: envprotection@richmond.gov.uk
Tel: 0845 612 2660

Building Control

www.richmond.gov.uk/building_control
Tel: 020 8891 7357

Conservation Areas and Listed Buildings

www.richmond.gov.uk/urban_design.htm
Tel: 020 8891 7322

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اگر در فهمیدن این نشریه مشکلی دارید لطفا به میز پذیرش در آدرس قید شده در زیر مراجعه نمایید تا ترتیب ترجمه تلفنی برایتان فراهم آورده شود:

Farsi

إذا كانت لديك صعوبة في فهم هذا المنشور، فنرجو زيارة الإستقبال في العنوان المعطى أدناه حيث بإمكاننا أن نرتب لخدمة ترجمة شفوية هاتفية.

Arabic

ਜੇਕਰ ਤੁਹਾਨੂੰ ਇਸ ਪਰਚੇ ਨੂੰ ਸਮਝਣ ਵਿਚ ਮੁਸ਼ਕਲ ਪੇਸ਼ ਆਉਂਦੀ ਹੈ ਤਾਂ ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਪਤੇ ਉੱਪਰ ਰਿਸੈਪਸ਼ਨ 'ਤੇ ਆਓ ਜਿੱਥੇ ਅਸੀਂ ਟੈਲੀਫ਼ੋਨ ਤੇ ਗੱਲਬਾਤ ਕਰਨ ਲਈ ਇੰਟਰਪ੍ਰਿਟਰ ਦਾ ਪ੍ਰਬੰਧ ਕਰ ਸਕਦੇ ਹਾਂ।

Punjabi