

Section one - Energy, Environment and Policy				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Introduction to energy use in the UK				
<ul style="list-style-type: none"> • Forms of energy • Where does our energy come from? • How is energy used? • Impacts of energy use • The basics - power, energy & CO₂ • Energy use in buildings 	<ul style="list-style-type: none"> • Gain a broad understanding of the more common forms of energy and how/where energy is used within the UK • Be aware of the various impacts of energy use including environmental impacts, resources and supply issues • Understand the basic concepts of power and energy and how energy consumption is linked to CO₂ emissions • Understand the significance of energy use within buildings and their typical energy demands 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (i) - Introduction to Energy Use in the UK.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (i) - Introduction to Energy Use in the UK.doc</p>	<p>Exercise 1.1a: Ask students to list the different forms of energy we use in the UK and where they come from</p> <p>Exercise 1.1b: Refer to the changes in domestic energy consumption from 'typical' dwellings to 'Part L 2006' dwellings and discuss the likely factors behind these changes</p>	<p>UK Energy in Brief: July 2007. http://www.berr.gov.uk/energy/statistics/publications/in-brief/page17222.html</p> <p>UK Climate Impact Programme. http://www.ukcip.org.uk/</p> <p>Energy and Carbon Conversion Factsheet. CTL004. The Carbon Trust.</p> <p>40% House. Boardman <i>et al</i>; Environmental Change Institute. 2005</p> <p>Energy Efficiency in Buildings. CIBSE Guide F. 2004</p> <p>Energy white paper 2007-08-08</p> <p>IPCC 4th Assessment report summary for policy makers</p> <p>CLG: The energy efficiency of dwellings - initial analysis Nov 2006</p>

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(ii) Climate change				
<ul style="list-style-type: none"> • What is climate change? • What is causing climate change? • What are the impacts? • What is being done? 	<ul style="list-style-type: none"> • Gain a broad understanding of what climate change is and why it is occurring • Be aware of the most important impacts of climate change • Understand the joint approaches of adaptation and mitigation in tackling these impacts 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (ii) - Climate Change.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (ii) - Climate Change.doc</p>	<p>Exercise 1.2a: Discuss what knock-on effects these climate change impacts may have in the UK [after Slide 13]</p> <p>Exercise 1.2b: Give examples of actual measures that can be implemented for each of the areas given under mitigation (energy efficiency, low or zero carbon energy sources, carbon capture) and adaptation (flooding, high temperatures, limited water resources) [after Slide 20]. Are there ways of linking mitigation and adaptation?</p>	<p>UK Climate Change Programme 2006 - http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm</p> <p>UK Climate Impacts Programme http://www.ukcip.org.uk/</p> <p>Defra website: http://www.defra.gov.uk/environment/climatechange</p> <p>Adapting to climate change - Lessons for London</p> <p>Adapting to climate change - a checklist for development http://www.climatesoutheast.org.uk/publications</p> <p>Climate Change bill 2007 http://www.defra.gov.uk/environment/climatechange/uk/legislation/</p> <p>Energy white paper 2007 http://www.berr.gov.uk/energy/whitepaper/page39534.html</p>

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				<p>London's warming (LCCP) http://www.london.gov.uk/climatechangepartnership/impacts.jsp</p> <p>Mayor's energy strategy http://www.london.gov.uk/mayor/strategies/energy/index.jsp</p> <p>Securing the Future - UK Government sustainable development strategy (2005) http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm</p> <p>Mayor's climate change action plan http://www.london.gov.uk/mayor/environment/climate-change/ccap/index.jsp</p>
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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(iii) Sustainable energy in the wider context				
<ul style="list-style-type: none"> • Sustainable Development • Sustainable Energy in Context • 'Healthy' Buildings 	<ul style="list-style-type: none"> • Gain a broad understanding of sustainable energy within the context of sustainable development • Understand the concept of 'healthy' buildings 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (iii) - Sustainable energy in the wider context.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (iii) - Sustainable energy in the wider context.doc</p>	<p>Exercise 1.3a: Discussion Point (Slide 8) - discuss examples of both mitigation and adaptation measures and how these may interact</p>	<p>Securing the Future - UK Government sustainable development strategy (2005) http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm</p> <p>Sustainable Development Commission http://www.sd-commission.org.uk</p> <p>London Sustainable Development Commission http://www.londonsdc.org/</p> <p>Sustainable communities plan 2003 http://www.communities.gov.uk/communities/sustainablecommunities/sustainablecommunities/</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(iv) Low carbon solutions for electricity, heating and cooling - an introduction				
<ul style="list-style-type: none"> • What is meant by low carbon energy? • Scope of technologies • Low carbon technologies for the generation of: <ul style="list-style-type: none"> - electricity - heating/cooling - combined generation 	<ul style="list-style-type: none"> • Understand the term 'low carbon' in regard to energy generation • Broadly understand the scope of technologies considered and the basic concepts of each 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (iv) - Low carbon solutions for electricity, heating and cooling - an introduction.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (iv) - Low carbon solutions for electricity, heating and cooling - an introduction.doc</p>	<p>Exercise 1.4a: Discussion Point (Slide 4) - which of these do you think holds most potential for widespread application in London?</p>	<p>BERR renewables website: http://www.berr.gov.uk/energy/sources/renewables/index.html</p> <p>Low or Zero Carbon Energy Sources: Strategic Guide. ODPM. 2006. http://www.planningportal.gov.uk/uploads/br/BR_PDF_PTL_ZEROCARBONfinal.pdf</p> <p>2007 Energy white paper http://www.berr.gov.uk/energy/whitepaper/page39534.html</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(v) Policy and legislation for sustainable energy - an introduction				
<ul style="list-style-type: none"> • Sustainable energy policy and legislation at the following levels: <ul style="list-style-type: none"> - International - EU - National - Regional - Local 	<ul style="list-style-type: none"> • Gain a broad understanding of the most important energy policy and legislation that is currently in place at the various levels of decision-making from international through to local policy level 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (v) - Policy and legislation for sustainable energy - an introduction.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (v) - Policy and legislation for sustainable energy - an introduction.doc</p>	<p>Exercise 1.5a: Discussion Point (Slide 12) - what do you think are the main challenges that local authorities are facing in formulating policy/legislation for sustainable energy?</p>	<p>2007 Energy White Paper - Meeting the Energy Challenge. http://www.berr.gov.uk/energy/whitepaper/page39534.html</p> <p>BERR website: UK energy policy and strategy http://www.berr.gov.uk/energy/policy-strategy/index.html</p> <p>EU Emissions Trading Scheme http://www.defra.gov.uk/environment/climatechange/trading/index.htm</p> <p>Overview of the Building Regulations (England & Wales) http://www.communities.gov.uk/planningandbuilding/buildingregulations/</p> <p>Climate Change bill 2007 http://www.defra.gov.uk/environment/climatechange/uk/legislation/</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(vi) Planning for sustainable energy - an introduction				
<ul style="list-style-type: none"> • Planning tiers and responsibilities • Planning instruments within the planning framework through which sustainable energy can be addressed • Spatial planning mechanisms for sustainable energy 	<ul style="list-style-type: none"> • Gain a broad understanding of how sustainable energy issues are addressed within the planning framework through the use of specific planning instruments • Be aware of the main spatial planning mechanisms that are used at the various levels 	<p>Presentation: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (vi) - Planning for sustainable energy - an introduction.ppt</p> <p>Lecture Notes: ..\Section 1 - Energy, Environment and Policy\Section One; Topic (vi) - Planning for sustainable energy - an introduction.doc</p>	<p>Exercise 1.6a -Discussion point (Slide 10) - what kind of wider environmental and economic benefits might be considered as material considerations?</p>	<p>Planning for Sustainable Homes: Meeting the Low Carbon Challenge. TCPA & URBED for Sustainability West Midlands. 2007 http://www.sustainabilitywestmidlands.org.uk/shap/</p> <p>Tackling Climate Change Through Planning: the Government's Objectives. TCPA & Friends of the Earth. 2006 http://www.foe.co.uk/resource/briefings/pps26_discussion_paper.pdf</p> <p>PPS1 Supplementary on climate change</p> <p>PPS22</p>

Section two - Low carbon technologies				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Energy efficiency technologies (and how they work)				
<ul style="list-style-type: none"> • Passive energy <ul style="list-style-type: none"> - Design principles • Efficient use of energy <ul style="list-style-type: none"> - Heat recovery - Appliances - CHP - Heat pumps 	<ul style="list-style-type: none"> • Gain a broad understanding of the more common forms of energy efficiency technologies • Understand the significance of good design to the energy performance of buildings • Understand the significance of energy efficiency technologies within buildings 	<p>Presentation: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (i) - Energy efficiency technologies (and how they work)First layout.ppt</p> <p>Lecture Notes: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (i) - Energy efficiency technologies (and how they work).doc</p>	<p>Exercise 2.1a: Bearing in mind the definition of passive energy, list the fundamental aspects of good building design (after slide 3)</p> <p>Exercise 2.1b: There are potential disadvantages to using some of these building materials. State a situation whereby using materials with a large thermal mass would be disadvantageous from an energy efficiency perspective (after slide 8)</p> <p>Exercise 2.1c: Bearing in mind the definition of passive energy, list the different common forms of energy efficiency technologies (after slide 11)</p> <p>Exercise 2.1d: Set out the opportunities and limitations of each of these technologies (after slide 11)</p>	<p>Government website for the code for sustainable homes http://www.planningportal.gov.uk/england/professionals/en/1115314116927.html</p> <p>On the importance of behavioural as well as technical changes, with a review of European 'passive house' standards http://www.leonardo-energy.org/drupal/files/LowEHouse.pdf?download</p> <p>BREEAM website with information on classification of a variety of buildings http://www.breeam.org/page_1col.jsp?id=54</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Renewable energy technologies (and how they work)				
<ul style="list-style-type: none"> • What are renewable generation technologies? • Scope of technologies • Sustainable energy technologies for the generation of: <ul style="list-style-type: none"> - Electricity - Heat 	<ul style="list-style-type: none"> • Gain a broad understanding of the different types of renewable energy (heat and electricity) • Understand the different methods of generation of each type of energy • Understand the limitations of each type of renewable generation 	<p>Presentation: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (ii) - Renewable energy technologies (and how they work).ppt</p> <p>Lecture Notes: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (ii) - Renewable energy technologies (and how they work).doc</p>	<p>Exercise 2.2a: Using the definition of renewable energy compile a list of types of generator which will supply renewable heat, renewable electricity or a combination of these (for use after slide 3)</p> <p>Exercise 2.2b: Calculate the annual output of a 1kWp solar PV panel in kWh assuming an annual output of 11% its rated output (for use after slide 5)</p> <p>Exercise 2.2c: Calculate the annual output in kWh of a 6kW Proven wind turbine given the power curve (see appendix) and an average wind speed of 5.5ms^{-1}. How does this compare to the output at 11ms^{-1} (the standard wind speed for defining the output of a wind turbine)?</p>	<p>A list of common renewables with information, and more detailed downloadable documents available: http://www.energysavingtrust.org.uk/generate_your_own_energy/types_of_renewables</p> <p>A portal to the Renewable Energy Association news items related to each technology http://www.r-e-a.net/REA</p> <p>A freely downloadable (with registration) set of course books and software to assist with renewable energy feasibility and decision-making. The course books cover all aspects, from a basic introduction to postgraduate-level discussions of the models used in the software http://www.retscreen.net/ang/t_software.php</p>

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(iii) Low and zero carbon energy (distributed generation) technologies (and how they work)				
<ul style="list-style-type: none"> • What are low/zero carbon (LZC) distributed generation (DG) technologies? • Scope of technologies • CHP generation using 'traditional' (normally gas-fired) systems • CHP/trigeneration using <ul style="list-style-type: none"> - Biomass - Landfill gas - Energy from waste 	<ul style="list-style-type: none"> • Gain a broad understanding of the types of LZC DG technologies which are available from renewable sources • Understand the benefits of LZC technologies over conventional generation • Understand the limitations of deployment of the different technologies 	<p>Presentation: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (iii) - Low and zero carbon energy technologies (and how they work).ppt</p> <p>Lecture Notes: ..\Section 2 - Low Carbon Technologies\Section Two; Topic (iii) - Low and zero carbon energy technologies (and how they work).doc</p>	<p>Exercise 2.3a: State some advantages to using solid-state (i.e. no moving parts) trigeneration over conventional trigeneration</p>	<p>A comparison of conventional vs. distributed generation http://www.aph.gov.au/Library/pubs/rn/1998-99/99rn21.htm</p>

Section three - Low carbon design				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Low Carbon Design - an Introduction				
<ul style="list-style-type: none"> • What is low carbon design? • What are the benefits? • What are the drivers? • Low carbon design fundamentals 	<ul style="list-style-type: none"> • Gain a broad understanding of the concept of low carbon design, the benefits and main drivers • Understand the principles behind the application of an energy hierarchy for low carbon design 	<p>Presentation: ..\Section 3 - Low Carbon Design\Section Three; Topic (i) - Low Carbon Design - an introduction.ppt</p> <p>Lecture Notes: ..\Section 3 - Low Carbon Design\Section Three; Topic (i) - Low Carbon Design - an introduction.doc</p>	<p>Exercise 3.1a [Discussion point - Slide 10] - what do you think is the reasoning behind this hierarchy?</p>	<p>Sustainable energy by design - a TCPA 'by design' guide for sustainable communities. TCPA, 2006 http://www.tcpa.org.uk/downloads/TCPA_SustEnergy.pdf</p> <p>Towards Zero Carbon Developments - Supportive Information to Boroughs. London Energy Partnership, 2006 http://www.london.gov.uk/mayor/environment/energy/partnership-steering-group/docs/LEP_towards_zero_carbon_developments.pdf</p> <p>Sustainable Design and Construction - the London Plan Supplementary Planning Guidance http://www.london.gov.uk/mayor/strategies/sds/sustainable_design.jsp</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Life cycle carbon emissions of buildings				
<ul style="list-style-type: none"> • How do buildings emit carbon? • Embodied energy • Operational energy • Life cycle carbon emissions • Embodied energy of low carbon measures 	<ul style="list-style-type: none"> • Gain a broad understanding of the difference between building carbon emissions through embodied energy and through operational energy use. • Understand how both factors relate to the life cycle carbon emissions for buildings • Understand the influence of low carbon measures on the life cycle carbon emissions for buildings 	<p>Presentation: ..\Section 3 - Low Carbon Design\Section Three; Topic (ii) - Life Cycle Carbon Emissions of Buildings.ppt</p> <p>Lecture Notes: ..\Section 3 - Low Carbon Design\Section Three; Topic (ii) - Life Cycle Carbon Emissions of Buildings.doc</p>	<p>Exercise 3.2a [Discussion point - Slide 6] - Proportionally, how do you think total embodied energy compares to total operational energy over the life cycle of a building?</p>	<p>Your Home Technical Manual - 3.1 Embodied Energy http://www.greenhouse.gov.au/yourhome/technical/fs31.htm</p> <p>Supporting and Delivering Zero Carbon Development in the South West - Final Technical Report. Faber Maunsell and Peter Capener for the South West Regional Assembly, South West Regional Development Agency (SWERDA) and Government Office for the South West (GOSW). 2007. Section 6. Available from http://www.southwest-ra.gov.uk/</p>

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(iii) Overview of standards for low carbon design				
<ul style="list-style-type: none"> • Building Regulations • Other standards • Future development of standards 	<ul style="list-style-type: none"> • Gain a broad understanding of the UK Building Regulations Part L - Conservation of fuel and power in buildings • Be aware of other relevant standards relating to low carbon design and the current expectations for future standards 	<p>Presentation: ..\Section 3 - Low Carbon Design\Section Three; Topic (iii) - Overview of Standards for Low Carbon Design.ppt</p> <p>Lecture Notes: ..\Section 3 - Low Carbon Design\Section Three; Topic (iii) - Overview of Standards for Low Carbon Design.doc</p>	<p>Exercise 3.3a [Discussion point -Slide 17] - What will be the implications of the targets up to 2016 from the developers' point of view? And the home owner/occupier?</p>	<p>Overview of Building Regulations http://www.communities.gov.uk/planningandbuilding/buildingregulations/</p> <p>Building Regulations Checklist: http://www.planningportal.gov.uk/uploads/br/BR_DOC_ADL1Acheck_2006.doc</p> <p>'MertonRule' on-site generation policy http://www.themertonrule.org/</p> <p>Code for Sustainable Homes http://www.communities.gov.uk/planningandbuilding/buildingregulations/legislation/england/wales/codesustainable/</p> <p>BREEAM http://www.breeam.org/</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(iv) Low carbon design in spatial planning - the London example				
<ul style="list-style-type: none"> • The London Plan • The London Plan Review • Low Carbon Policy 	<ul style="list-style-type: none"> • Gain a broad understanding of the policy areas within the Draft Further Alterations to the London Plan that relate to climate change mitigation that will influence low carbon design 	<p>Presentation: ..\Section 3 - Low Carbon Design\Section Three; Topic (iv) - Low Carbon Design in Spatial Planning - the London example.ppt</p> <p>Lecture Notes: ..\Section 3 - Low Carbon Design\Section Three; Topic (iv) - Low Carbon Design in Spatial Planning - the London example.doc</p>	None	<p>The London Plan http://www.london.gov.uk/mayor/strategies/sds/index.jsp</p> <p>Draft Further Alterations to the London Plan http://www.london.gov.uk/mayor/strategies/sds/further-alt/ docs.jsp</p> <p>Note - final (revised) London Plan expected March 2008.</p>

Section four (part a) - Large- and medium-scale low carbon developments				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Introduction and some definitions				
<ul style="list-style-type: none"> Sets the context, introduces and defines the key policies, principles and targets which give the drivers for how sustainable energy options are considered This topic introduces the London Plan and the policies it sets out for improving the use of energy in developments. It then looks at the Mayor's Energy Strategy and the policies, and principles this sets out. Next the London Plan Supplementary Planning Guidance is examined and the standards this sets out for developments are introduced. Then, the definition of major development is considered. Finally, definitions for zero and low carbon developments are looked at 	<ul style="list-style-type: none"> Understand the key policies, principles and targets for energy set out in the spatial development strategy for Greater London; Recognise the standards this sets out for developments and know where to find guidelines for how these can be addressed; and, Have definitions for key terms used throughout this topic. 	<p>Presentation: ..\Section 4 - Low Carbon Developments\Section Four (a); Topic (i) - Introduction & Definitions.ppt</p> <p>Lecture Notes: ..\Section 4 - Low Carbon Developments\Section Four (a); Topic (i) - Introduction & Definitions.doc</p>	None	<p>Handouts:</p> <ol style="list-style-type: none"> 16-page summary document: <i>Green light to clean power: Highlights of the Mayor's Energy Strategy</i> Section 2.3.2 - Energy in Sustainable Design and Construction - <i>The London Plan Supplementary Planning Guidance</i>, pp. 32 - 37 CSE and London Borough of Merton. Definitions of Zero Carbon Developments' in <i>Towards Zero Carbon Developments - Supportive Information to Boroughs</i>, pp. 9 - 10 and 'Appendix A - Further Notes on Definitions' pp. 60 - 61

Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Energy supply				
<ul style="list-style-type: none"> This topic looks at the factors to consider when drawing up sustainable energy options for large- and medium-scale low carbon developments It begins by introducing and defining the key concepts to consider. It explores the characteristics of a development or site which may be suited to low or zero carbon developments. It then looks at the choice of technologies and covers general issues relating to community energy networks, combined heat and power, energy efficiency and renewables 	<ul style="list-style-type: none"> Gain an overview of how energy efficiency and renewable energy generation can best be applied to large/medium scale developments Understand the opportunities and issues around technologies for this scale of development Recognise and understand the factors involved in considering large- and medium-scale low carbon developments 	<p>Presentation: ..\Section 4 - Low Carbon Developments\Section Four (a); Topic (ii) - Energy Supply.ppt</p> <p>Lecture Notes: ..\Section 4 - Low Carbon Developments\Section Four (a); Topic (ii) - Energy Supply.doc</p>	<p>Exercise 4(a).2a: Using the flow diagrams given in Faber Maunsell (2004, p. 91 - 100) draw up a short list of renewable energy technologies for a development scenario given as a handout</p>	<p>Handouts:</p> <ol style="list-style-type: none"> Rules of thumb for renewable sources in development scenarios from Faber Maunsell (2004, p. 101 - 103) Flow diagrams from Faber Maunsell (2004, p. 91 - 100) Example development scenario: ..\Section 4 - Low Carbon Developments\Example Development - Energy Strategy.doc

Section four (part b) - Small-scale low carbon developments				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Introduction and some definitions				
<ul style="list-style-type: none"> This topic defines what is meant by small-scale and sets in context the key principles and targets which give the drivers for how sustainable energy options are considered This topic briefly considers the definition of small-scale development and concludes that while there is no formal definition of what small-scale means a workable definition can be arrived at. This topic also briefly looks at scales of development in local policies and principles the standards for energy that apply to these developments. In particular the energy and carbon dioxide emissions category of the Code for Sustainable Homes is examined 	<ul style="list-style-type: none"> Understand the definitions, principles and targets for energy for developments in Greater London; Recognise the standards this sets out for developments and know where to find guidelines for these; and, Have definitions for key terms used throughout the topic. 	<p>Presentation: ..\Section 4 - Low Carbon Developments\Section Four (b); Topic (i) - Introduction & Definitions.ppt Lecture Notes: ..\Section 4 - Low Carbon Developments\Section Four (b); Topic (i) - Introduction & Definitions.doc</p>	None	<p>Handouts:</p> <ol style="list-style-type: none"> Department for Communities and Local Government (2007). 'Category 1 - Energy and Carbon Dioxide Emissions' in Code for Sustainable Homes - Technical Guide. London: DCLG, pp. 26 - 66 http://www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Energy supply				
<ul style="list-style-type: none"> This topic looks at the factors to consider when drawing up sustainable energy options for small-scale low carbon developments It begins by introducing and defining the key concepts to consider. It then explores the characteristics of a development or site which may be suited to low or zero carbon developments. It then looks at the choice of technologies and covers general issues relating to energy efficiency and renewables 	<ul style="list-style-type: none"> Gain an overview of how energy efficiency and renewable energy generation can best be applied to small-scale developments Understand the opportunities and issues around technologies for this scale of development Recognise and understand the factors involved in considering this scale of low carbon development 	<p>Presentation: ..\Section 4 - Low Carbon Developments\Section Four (b); Topic (ii) - Energy Supply.ppt Lecture Notes: ..\Section 4 - Low Carbon Developments\Section Four (b); Topic (ii) - Energy Supply.doc</p>	<p>Exercise 4(b).2a: Using the flow diagrams given in Faber Maunsell (2004, p. 91 - 100) draw up a short list of renewable energy technologies for a development scenario given as a handout</p>	<p>Handouts:</p> <ol style="list-style-type: none"> Rules of thumb for renewable sources in development scenarios from Faber Maunsell (2004, p. 101 - 103) Flow diagrams from Faber Maunsell (2004, p. 91 - 100) Example development scenario: ..\Section 4 - Low Carbon Developments\Example Development - Energy Strategy.doc

Section five - Planning for sustainable energy				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Planning policy context and the importance of policy integration				
<ul style="list-style-type: none"> The relevance of each level of planning to sustainable energy A brief history of planning for sustainable energy Planning policy integration Two case studies focused on the "Merton Rule" 	<ul style="list-style-type: none"> Gain an understanding of recent developments in planning policy dealing with sustainable energy Understand the importance of achieving a good level of integration between each "level" of planning. 	<p>Presentation: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (i) - Planning Policy Context and the Importance of Policy Integration.ppt</p> <p>Lecture Notes: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (i) - Planning Policy Context and the Importance of Policy Integration.doc</p>	<p>Exercise 5.1a: [Discussion points - slides 13 & 14] on what the Merton experience tells us, the importance of policy integration, how long it's taken the planning system to embrace sustainable energy, inconsistencies in national planning policy as the emphasis on sustainable energy increases, other aspects that would benefit from integration, how to equip planners to deal effectively with developers</p>	<p>TCPA Policy Statement: Planning for Sustainable Energy, available at www.tcpa.org.uk</p> <p>"Using the Merton Rule TCPA Survey July 2006" - handout (4 sides) www.tcpa.org.uk</p> <p>PPS1 Supplement Planning and Climate Change</p> <p>PPS22 Renewable Energy</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Planning policy framework 2007 - a new agenda for sustainable energy				
<ul style="list-style-type: none"> This topic reviews the new agenda for planning for sustainable energy set out in PPS1, the PPS1 Supplement on Climate Change, and PPS22 	<ul style="list-style-type: none"> Gain an understanding of some of the challenges faced in seeking to implement the PPS1 Supplement's new agenda for sustainable energy 	<p>Presentation: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (ii) - Planning Policy Framework 2007 A New Agenda for Sustainable Energy.ppt</p> <p>Lecture Notes: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (ii) - Planning Policy Framework 2007 A New Agenda for Sustainable Energy.doc</p>	<p>Exercises to help appreciate what is involved in meeting the requirements of PPS1 Supplement on Climate Change. Including:</p> <p>5.2a. Assessing an area's potential for renewable energy</p> <p>5.2b. Promoting decentralised low carbon energy supply</p> <p>5.2c. Applying passive solar design principles</p> <p>5.2d. Community involvement and awareness raising</p> <p>5.2e. Weighing impacts and benefits</p> <p>5.2f. Assessing viability and undue burden</p>	<p>A Guide to the Barking Town Centre Energy Action Area http://www.lep.org.uk/uploads/GUIDE%20TO%20ENERGY%20ACTION%20AREA.pdf</p> <p>PPS1 Supplement Planning and Climate Change</p> <p>PPS22 Renewable Energy and PPS22 Companion Guide</p> <p>Using the Merton Rule TCPA Survey July 2006</p> <p>Communities and Local Government "Changes in Permitted Development Consultation 1: Permitted Development Rights for Householder Microgeneration" April 2007</p> <p>http://www.communities.gov.uk/archived/publications/planningandbuilding/changespermitted</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(iii) Energy as part of integrated policy in London				
<ul style="list-style-type: none"> • The Background to Energy Policy in London • The London Plan • Selected Planning Policies from Boroughs & Milton Keynes • Policy Development Overview 	<ul style="list-style-type: none"> • Gain an understanding of the way in which policy for sustainable energy is developing in London, and be aware of some of the challenges faced by planners in implementing these policies 	<p>Presentation: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (iii) - Energy as part of Integrated Policy in London.ppt</p> <p>Lecture Notes: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (iii) - Energy as part of Integrated Policy in London.doc</p>	<p>Exercise 5.3a: [Discussion points - slides 31] on the ability of the development industry to keep up with a rapidly changing policy environment, the value of carbon offsetting policies, whether the most recent Merton proposals go too far</p>	<p>Handouts:</p> <ol style="list-style-type: none"> 1. The London Plan 2004: pages 164 to 170 2. The Mayor's Energy Strategy 2004: Executive Summary 3. The London Plan Draft Further Alterations September 2006: Chapter 4A 4. Using the "Merton Rule" TCPA Survey Report July 2006 www.tcpa.org.uk 5. Merton Development Control DPD Preferred Options Environmental Protection Policies DC P 1 - 4 6. Croydon UDP Environmental Protection policies 7. Milton Keynes Council "Interim Guidance on Sustainable Construction (Housing) 2006"

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(iv) Use of supplementary planning documents, SPD, in London				
<ul style="list-style-type: none"> • The role of SPD/SPG • Mayor of London SPG • London Borough of Merton SPD • London Borough of Croydon SPG • London Borough of Woking 	<ul style="list-style-type: none"> • Gain an understanding of the way in which SPG/SPD is being used to help implement policy for sustainable energy in London 	<p>Presentation: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (iv) - Use of Supplementary Planning Documents, SPD, in London.ppt</p> <p>Lecture Notes: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (iv) - Use of Supplementary Planning Documents, SPD, in London.doc</p>	<p>None</p>	<p>The London Plan SPG Sustainable Design & Construction pages 32 - 37 & 88 - 91</p> <p>London Energy Partnership 2004 Renewable Energy in London: The Role of Planners</p> <p>London Energy Partnership 2007 Planning Policy: Making it Happen Capacity Building of Planners and Others Implementing Energy Policy in London</p> <p>http://www.lep.org.uk/uploads/capacity-building.pdf</p> <p>London Borough of Croydon 2004 SPG 15 Renewable Energy</p> <p>London Borough of Merton Sustainable Design and Construction SPD July 2007</p>

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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(v) Impact on cultural heritage - considerations for listed buildings, conservation areas, and other designations				
<ul style="list-style-type: none"> The policy framework for dealing with sensitive buildings and areas The possible impacts of renewable energy technologies on cultural heritage, including Listed Buildings, Conservation Areas, Archaeology, and other Nationally Designated Areas 	<ul style="list-style-type: none"> Gain an understanding of the special considerations that apply to renewable energy development in relation to protected areas and buildings 	<p>Presentation: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (v) - Impact on Cultural Heritage.ppt</p> <p>Lecture Notes: ..\Section 5 - Planning for Sustainable Energy\Section 5; Topic (v) - Impact on Cultural Heritage.doc</p>	<p>Exercise 5.5a: [Discussion points - slides 21] on the impact of small-scale renewables on listed building or national park designation, relaxing controls on small-scale renewables in conservation areas, and where the priority lies between protection and promoting renewables</p>	<p>PPS22 and PPS22 Companion Guide, in particular the Technical Annexes</p> <p>PPS7 and PPGs15 & 16</p> <p>Changes to Permitted Development Consultation Paper 1, April 2007, DCLG</p> <p>http://www.communities.gov.uk/archived/publications/planningandbuilding/changespermitted</p>

Section six - delivery of sustainable energy through planning				
Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(i) Key planning processes				
<ul style="list-style-type: none"> Plan preparation Development control & use of planning instruments Assessment and performance issues Case study example 	<ul style="list-style-type: none"> Gain an understanding of the way in which planning can help to deliver sustainable energy through the plan making and development control processes 	<p>Presentation: ..\Section 6 - Delivery of Sustainable Energy through Planning\Section 6; Topic (i) - Key Planning Processes.ppt</p> <p>Lecture Notes: ..\Section 6 - Delivery of Sustainable Energy through Planning\Section 6; Topic (i) - Key Planning Processes.doc</p>	<p>Exercise 6.1a. Using the information in Exercise 5.2d in Section 5 Topic (ii) - assess the potential for using renewables in relation to each site and development package, and make recommendations. Also, consider what planning conditions or subjects for S106 Agreements may be appropriate.</p>	<p>"Using the Merton Rule" July 2006 TCPA http://www.tcpa.org.uk/climate_change_files/20060724-LA_Survey.pdf</p> <p>"Planning Policy: Making it Happen - Capacity Building of Planners and Others Implementing Energy Policy in London - Project Report" LEP March 2007 http://www.lep.org.uk/uploads/capacity-building.pdf</p> <p>Mayor of London SPG on Sustainable Design and Construction</p> <p>"Building a Greener Future: Towards Zero Carbon Development" DCLG 2006 http://www.communities.gov.uk/archived/publications/planningandbuilding/buildinggreener</p>

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				<p>"Code for Sustainable Homes - A step-change in sustainable building practice" DCLG 2006</p> <p>http://www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf</p>
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Topic	Learning outcome/description	Lecture materials	Activities & exercises	Resources
(ii) Toolkits				
<ul style="list-style-type: none"> This topic reviews toolkits prepared in: <ul style="list-style-type: none"> - London - Low Carbon Designer Toolkit - Kirklees - Kirklees Council Toolkit 	<ul style="list-style-type: none"> Gain an understanding of two of the available renewable energy toolkits and the ways in which they can be applied 	Presentation: ..\Section 6 - Delivery of Sustainable Energy through Planning\Section 6; Topic (ii) - Toolkits.ppt Lecture Notes: ..\Section 6 - Delivery of Sustainable Energy through Planning\Section 6; Topic (ii) - Toolkits.doc	Exercise 6.2a. Use the Kirklees Toolkit to assess a project - consider the suitability of specific renewable energy technologies and their economic and environmental performance	LEP/London Renewables 2004 The London Toolkit "Integrating renewable energy into new developments: Toolkit for planners, developers and consultants Kirklees Renewable Energy Toolkit available on CD

Notes:

Please note that the materials were developed over the course of 2007, since when a number of elements dealt with have been altered or superseded, for example the London Plan. The LEP is currently looking at how these areas might be updated and will post revision as appropriate. This should not detract from the usefulness of the materials to other regional groups who would have to review and tailor the content to their own needs regardless. **These elements under review are marked as yellow in this document and the Course Matrix.**