WOLVERHAMPTON CITY COUNCIL

SUPPLEMENTARY PLANNING DOCUMENT (SPD)

RENEWABLE AND LOW CARBON ENERGY

Adopted 11th September 2012

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Planning Policy and Area Plans, Wolverhampton City Council, Civic Centre St. Peter's Square, Wolverhampton, WV1 1SH. Tel: 01902 555636 Email: planning.policy@wolverhampton.gov.uk.

Bengali

"এই দলিল/তথ্য ইংরেজি ছাড়া অন্য ভাষায়,বড় ছাপার অক্ষরে, ব্রেইল অথবা অডিওতে পাওয়া যেতে পারে । আপনি যদি এটা এই রকম কোন একটি আকারে পেতে চান তাহলে অনুগ্রহ করে যোগাযোগ করুন:

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Farsi

"این متن/اطلاعات را می توانیم به زبان هایی بغیر از انگلیسی، با حروف چاپی درشت، به خط بریل یا بصورت صوتی ارائه نماییم. اگر مایل به دریافت متن یا اطلاعات به یکی از فرمت های ذکر شده هستید، لطفاً با اینجا تماس بگیرید:

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Gujerati

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Hindi

"यह दस्तावेज/सूचना अंग्रेजी के अतिरिक्त अन्य भाषाओं, बड़े प्रिंट, ब्रेल या ऑडियो में भी उपलब्ध कराये जा सकते हैं। यदि आपको यह, उपरोक्त किसी रूप में चाहिए तो कृपया सम्पर्क करें:

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Polish

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Punjabi

"ਇਹ ਦਸਤਾਵੇਜ਼/ਜਾਣਕਾਰੀ ਅੰਗ੍ਰੇਜ਼ੀ ਦੀ ਬਜਾਇ ਹੋਰਨਾਂ ਭਾਸ਼ਾਵਾਂ, ਵੱਡੇ ਅੱਖਰਾਂ, ਬ੍ਰੇਲ ਜਾਂ ਆਡੀਓ ਵਿਚ ਉਪਲਬਧ ਕਰਾਈ ਜਾ ਸਕਦੀ ਹੈ। ਜੇ ਤੁਹਾਨੂੰ ਇਸਦੀ ਇਹਨਾਂ ਰੂਪਾਂ ਵਿਚੋਂ ਕਿਸੇ ਇੱਕ ਵਿਚ ਲੋੜ ਹੈ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਸੰਪਰਕ ਕਰੋ:

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Urdu

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Glossary

1. BACKGROUND

The Black Country Core Strategy (2011-26)

1.1 The Black Country Core Strategy (the Core Strategy) was adopted on 3rd February 2011. The Black Country covers Dudley, Sandwell, Walsall and Wolverhampton Council areas. The Core Strategy now forms part of the Development Plan for all four Black Country Councils ("the Councils"), together with saved policies in the Councils' Unitary Development Plans. Planning permissions granted from 3 February 2011 onwards have to be assessed against policies in the Core Strategy. The Council's Development Plan Documents (DPDs) and Supplementary Planning Documents (SPDs) also have to be consistent with the Core Strategy.

1.2 The Black Country Core Strategy can be viewed at: *http://blackcountrycorestrategy.dudley.gov.uk*

Policy ENV7: Renewable Energy

1.3 Core Strategy Policy ENV7: Renewable Energy requires residential development of 10 dwellings or more and non-residential development of 1000m2 or more to secure at least 10% of their residual energy from renewable energy sources. Policy ENV7 replaces Wolverhampton UDP (2006) Policies EP16 and EP17.

Policy ENV7: Renewable Energy

Proposals involving the development of renewable energy sources will be permitted where the proposal accords with local, regional and national guidance and would not significantly harm the natural, historic or built environment or have a significant adverse effect on the amenity of those living or working nearby, in terms of visual, noise, odour, air pollution or other effects.

All non-residential developments of more than 1,000 square metres floor space and all residential developments of 10 units or more gross (whether new build or conversion) must incorporate generation of energy from renewable sources sufficient to off-set at least 10% of the estimated residual energy demand of the development on completion. The use of on-site sources, off-site sources or a combination of both should be considered. The use of combined heat and power facilities

should be explored for larger development schemes. An energy assessment must be submitted with the planning application to demonstrate that these requirements have been met.

The renewable energy target may be reduced, or a commuted sum accepted in lieu of part or all of the requirement, only if it can be demonstrated that:

- **a variety of renewable energy sources and generation methods have been assessed and costed;**
- **achievement of the target would make the proposal unviable (through submission of an independently assessed financial viability appraisal); and**
- **the development proposal would contribute to achievement of the objectives, strategy and policies of the Core Strategy.**

Why is a Supplementary Planning Document (SPD) required?

1.4 Policy ENV7 does not explain, in detail, how the thresholds provided should be applied. For example, how does the 1,000 sqm apply to extensions to existing buildings? The Policy does not elaborate on the types of energy generation which would meet the 10% requirement, nor does it explain what "residual energy demand" is, or explain what an "energy assessment" should include.

1.5 As Policy ENV7 is the first policy in the Black Country to require renewable energy provision, it is appropriate to provide more detailed guidance to expand on these issues. This SPD is intended to assist land-owners, developers and builders and to clarify how the Policy should be applied.

Improving Energy Efficiency and Reducing Carbon Emissions

1.6 According to the Energy Saving Trust, around 27% of the UK's total carbon emissions come from the domestic housing sector through energy use in the home for heating, hot water, lighting and appliances. New homes and buildings provide a real opportunity to deliver substantial cuts in carbon emissions. Incorporating energy efficiency measures into the design and construction of a building can significantly reduce the amount of energy consumed, the carbon dioxide (CO_2) emitted and the running costs of the building over its lifetime.

1.7 Carbon emissions reduction measures for new development are controlled by Part L of the Building Regulations, which were revised in 2010. These measures will be strengthened further in 2013. By 2016, all new homes built

will need to meet “zero carbon” standard, which will involve high levels of energy efficiency and also the provision of renewable or low carbon energy to offset any remaining energy demands. By 2019, all non-residential developments will need to meet “zero carbon” standard. It is expected that some degree of “off-setting” will be allowed, whereby payments are made for off-site carbon reduction.

1.8 Therefore, incorporating energy efficiency principles in the early design of new development can considerably reduce the demand for energy and reduce carbon dioxide emissions. Some of the potential areas for consideration when seeking to improve the energy efficiency of buildings, both at development and use stages, are:

- Building design - Passive solar design
- Landscaping
- Internal layout
- Thermal mass
- Insulation
- Energy efficient appliances
- Natural lighting
- Natural ventilation

1.9 Energy efficiency measures do not in themselves contribute towards meeting Core Strategy Policy ENV7 (see para 3.2). However, reducing the total energy demand of a building also reduces the amount of energy which needs to be generated from sustainable technologies.

2. DETAILED APPLICATION OF POLICY ENV7

Definition of Renewable Energy

2.1 The Council considers renewable, decentralised and low carbon technologies to meet the requirements of Policy ENV7. For the purposes of this SPD, these are referred to collectively as "sustainable" technologies, producing "sustainable" energy. The supply of energy from a green tariff scheme (i.e. renewable energy from the grid) will not meet the requirements of Policy ENV7. Further information on the types of technologies which meet this definition is provided in Section 4.

Residential Developments

2.2 The residential threshold of Policy ENV7 applies to both new build and to conversions which will create 10 dwellings or more. This applies regardless of the number of dwellings which may have existed on the site prior to development. For example, if 2 houses are converted to 10 flats, the minimum 10% requirement will apply. Likewise, if 3 houses are demolished and a block of 10 flats constructed to take their place, the minimum 10% requirement will apply.

2.3 Where a mixed use development will provide less than 10 dwellings, the floor space of these dwellings will be added to the non-residential floor space, and if this total is 1,000 sqm floor space or more the minimum 10% requirement will apply.

Non-residential Developments

2.4 The non-residential threshold applies to all proposals outside Use Class C3, "Dwellinghouses", including nursing homes and residential institutions. The term "1,000 sqm floor space" refers to the total gross external floor space of all floors of a building.

2.5 Policy ENV7 applies regardless of any buildings which may occupy the site prior to development. For example, if a 500 sqm floor space office block is demolished and a 1,010 sqm floor space industrial unit constructed on the same footprint, the minimum 10% requirement will apply. This will also apply if part of a building is to be demolished and an extension of more than 1,000 sqm floor space built. In this case Policy ENV7 will only apply to the extension (see below).

2.6 The minimum 10% requirement will apply to extensions to existing buildings and to the creation of mezzanine floors, where these will create 1,000 sqm new floor space or more. In these cases, the estimated residual energy demand (see below) will be calculated on the basis of the difference between the energy demand of the existing building and the energy demand of the building following extension / creation of mezzanine floors.

2.7 The minimum 10% requirement will also apply to developments involving the change of use of a building or buildings consisting of 1,000 sqm floor space or more. In these cases, the estimated residual energy demand (see below) will be calculated on the basis of the difference between the energy demand of

the existing building and the energy demand of the building following change or use. Where a building has not been in use for 10 years or more prior to submission of the planning application, the energy demand of the existing building will be assumed to be zero.

2.8 Where an application for a range of uses is proposed (e.g. Use Class B1, B2 or B8), then the worst-case (i.e. highest) estimated baseline energy demand should be used. This will ensure that no matter what the final use, the minimum 10% requirement will be met.

Energy Generation Proposals

2.9 Proposals which involve the generation of energy and occupy a built floorspace of 1,000 sqm or more must also meet the requirements of Policy ENV7. An Energy Statement should be submitted for such proposals. Opportunities should be taken to maximise on-site use of any sustainable energy generated, for example to heat buildings.

Different Stages of the Planning Process

Pre-application

2.10 Planning for energy efficiency and sustainable energy is more cost effective at the design stage. It is therefore fundamental that energy efficiency measures through design, orientation, layout and sustainable energy are considered at the earliest opportunity.

2.11 The developer should initially consider the advice in this SPD and contact the Council with any queries this may raise. Where a building or site is a heritage asset or development would affect the setting of a heritage asset advice should also be sought from historic environment officers at the Council.

Outline Applications

2.12 In order to demonstrate that the requirements of Policy ENV7 are capable of being met, an Energy Assessment (EA) must be submitted with eligible outline planning applications.

2.13 It is appreciated that it may not be possible to demonstrate detailed compliance with the minimum 10% requirement at outline stage, as specific development information may be limited. However, consideration should be given to the potential of the development to meet the requirements of Policy ENV7, including demonstrating that one or more sustainable technologies are practical and viable. Benchmarks may be used if detailed building energy use figures are not available. Consideration should be had to the potential effect of technologies on the design of the development. If layout and scale details are submitted for determination, more detailed information should be provided.

2.14 Sustainable energy and efficiency measures should be considered at a site-wide level in order to inform the framework for considering reserved matters. The Council will impose planning conditions or require a Section 106 agreement to ensure that reserved matter applications follow the same route and provide the same documentation required for full applications.

Detailed Applications

2.15 A full Energy Assessment should be submitted to accompany detailed applications, providing all of the information set out in this SPD. Policy ENV7 will not apply to applications for specified reserved matters under an outline permission granted prior to adoption of the Core Strategy.

2.16 Where an application will affect a heritage asset the impact of any sustainable technology measures on historic, architectural or archaeological significance should be addressed. It should be noted that where a building is included on the statutory list any alterations to historic fabric will also require a separate application for Listed Building Consent.

Planning Conditions and Section 106 Agreements

2.17 Planning conditions will generally be used to secure the minimum 10% sustainable energy requirement, or other requirement agreed following consideration of viability issues (see below). However, there may be some cases where the use of a Section 106 agreement will be more appropriate, for example, where an off-site solution is proposed. For developments that involve heritage assets, conditions may be used to secure adequate assessment and recording in advance of installations that may result in loss of features of significance.

Monitoring

2.18 There is a Core Strategy indicator which will monitor the proportion of eligible developments meeting the 10% sustainable energy target. However, it is also important to monitor successful implementation of Policy ENV7, and how far this may vary depending on the size and type of development and the technologies applied. Monitoring information on actual energy use and energy generation collected from developments across the City will be analysed and reported in the Council's Annual Monitoring Report. This analysis will be used to inform implementation of Policy ENV7 and, potentially, future amendments to this SPD.

2.19 Therefore, for all eligible developments, accurate monitoring of the actual residual energy demand of the development and of energy production from sustainable technologies will be required for the first 3 years of operation. This information should be provided to the Council on at least an annual basis. The provision of information will be secured through condition or Section 106 agreement. Any information provided will be used only for monitoring purposes.

2.20 Energy monitoring is easy to achieve using a data logger fitted to the energy meter. This service is provided by a number of companies. Information regarding energy use can then be sent to a website where the energy generation can be logged. This information can then be accessed by any specified users, which could include a contact name at the Council, the freeholder and the occupant. For housing developments, monitoring data from a sample of different house types may be appropriate.

Financial Viability

2.21 Financial viability arguments will only be accepted if, as set out in Policy ENV7:

- a variety of sustainable energy sources and generation methods have been assessed and costed;
- achievement of the target would make the proposal unviable (through submission of an independently assessed financial viability appraisal); and
- the development proposal would contribute to achievement of the objectives, strategy and policies of the Core Strategy.

2.22 The Council will expect clear evidence and justification to be presented as to why a development cannot achieve either part or all of the 10% requirement. This should include the details of any rejected options and take full account of any subsidies and grants likely to be available at the time of construction.

2.23 Any financial viability appraisal (FVA) will need to take account of all other planning obligations for the development, such as affordable housing, and therefore should take place at outline or full application stage, or at reserved matters stage in some circumstances. FVA is not appropriate at discharge of condition stage. The applicant will be expected to cover the Council's reasonable costs of having the FVA independently assessed.

3. CALCULATING THE SUSTAINABLE ENERGY REQUIREMENT

Estimated Residual Energy Demand

3.1 The "estimated residual energy demand", or "baseline", for a development will be used to establish what amount of energy the minimum 10% sustainable energy requirement relates to. Typical energy demands for new development arise from space heating, hot water, lighting, appliances, cooking and specialist equipment for commercial uses. The Building Regulations only consider performance in terms of regulated energy, that is, energy for space heating, hot water and internal lighting. However, the total energy consumption of the development will also include cooking, appliances and features such as outdoor lighting. Policy ENV7 applies to total energy consumption i.e. the estimated annual energy demand of the development for space heating, hot water, lighting, appliances and cooking.

3.2 The term "residual" means that the estimated energy demand for the development should be calculated after allowance has been made for the full range of energy efficiency measures required under Building Regulations (current at the time of construction). This will ensure that the 10% sustainable energy requirement does not result in a reduction in the energy efficiency / carbon emission standards of development secured through Building Regulations. Rather, the 10% sustainable energy requirement will result in an improvement in the carbon emissions of eligible developments, over and above the current Building Regulations standard.

3.3 Passivhaus standard buildings are designed to use very little energy for heating and cooling and achieve a significant reduction in both regulated and unregulated energy use compared to UK standard practice. Passivhaus buildings are monitored following construction and evidence to date shows that they are performing to standard, compared to many other UK buildings, where the discrepancy between design aspiration and as-built performance can be as much as 50-100%. Therefore, in the exceptional case of certified Passivhaus developments, flexibility will be applied regarding the 10% sustainable energy requirement.

Relationship between Carbon Emissions and Energy Demand

3.4 Whilst at the international and national level carbon emissions are considered to be the most appropriate method for calculations, Policy ENV7 relates to energy usage i.e. kilowatt-hours per year (kWh/yr). The Council is aware that this method does not take into account the different levels of carbon emissions produced from gas and electricity use.

Methodologies and Benchmark Data used to Calculate the Estimated Residual Energy Demand

3.5 Where detailed information is not available, energy consumption benchmarks should be used to generate the estimated residual energy demand of different types of development. To ensure consistency and for monitoring purposes, the following energy consumption benchmarks (or the most recent version), should be used for Energy Assessments in Wolverhampton:

Non-Domestic - CIBSE Energy Benchmarks (TM46:2008), covering 29 categories of building type

Domestic - SAP 2009 calculations of typical domestic properties and energy consumption figures from the Standard House Set (developed by BRE & DEFRA) as calculated using BREDEM.

3.6 Where there is no detailed information, every building type should be assumed to use gas for heating and electricity for all other energy requirements and the average split between the two fuel types should be defined from CIBSE or SAP 2009 data for each building type. For example, a typical detached house might use 30% of its annual energy in electricity and 70% in gas.

Step by Step Guide

3.7 The following provides a step-by step guide on how to calculate and present information to show compliance with Policy ENV7.

STEP 1: Calculating the baseline and the minimum 10% sustainable energy requirement

3.8 Table 1 in Appendix 1 provides an example of how to present your calculations for the baseline. All figures should be presented as KWh per year. All calculations should be clearly set out, and summarised.

3.9 The 10% requirement for sustainable energy is calculated using the following formula: Baseline x 0.1 = 10% requirement for renewable energy (in KWh per year)

STEP 2: Determining which sustainable technologies are suitable for the development

3.10 Once the minimum 10% figure has been calculated, applicants will need to decide which sustainable technology or technologies is suitable for their development in terms of:

- Ability to deliver a minimum of 10% of the baseline energy demand (following application of current Building Regulations);
- Ability to be integrated into the development, including any design and historic environment issues;
- Cost effectiveness of different technologies.

3.11 There are a range of sustainable technologies that can be considered, as set out in Section 4. It is for the applicant to explore the different types of technologies available and calculate which of these are capable of meeting the minimum 10% target. The Council will not be prescriptive about which technologies are provided within a development so long as they are capable of delivering the minimum 10% target and do not cause other planning problems such as adverse impacts on design or character, unnecessary loss

of heritage significance, noise pollution, odour or air pollution, or impacts on protected trees or important buried archaeology.

3.12 In the case of Combined Heat and Power plants run on fossil fuels, only the heat generated by the plant will be classed as sustainable energy, and therefore contribute towards the minimum 10% target.

3.13 Policy ENV7 allows for the use of off-site sources, and these should be explored as far as possible, with the results reported in the Energy Assessment. Section 4 also includes information on design issues associated with each technology which should be taken into consideration when assessing their feasibility and viability, and provides guidance on the approach for large developments.

3.14 Policy ENV7 requires developers of large sites to consider the opportunities for CHP. Co-operation between developers on larger sites where two or more separate development schemes are proposed is also encouraged. Opportunities for connection to a sustainable energy supply, where available, are encouraged, as are opportunities for working together to benefit from economies of scale.

3.15 It is recommended that each sustainable technology be considered in turn and a short analysis undertaken to explain why it is/ is not suitable for the site. It may be the case that one technology alone cannot deliver the minimum 10% target, in which case it may be necessary to combine technologies.

3.16 The calculations for the estimated energy yield from the sustainable technology should be clearly set out, and summarised, as set out in Table 2 of Appendix 1.

STEP 3: The Energy Assessment

3.17 The information in Steps 1 & 2 should be presented in an Energy Assessment, as set out in Policy ENV7. This should be submitted with the planning application, and may form part of another supporting document. The Energy Assessment may include an energy statement generated using online resources such as Enplanner (enplanner.com). However, the Energy Assessment will also need to include text explaining how the selected technologies were chosen and other appropriate information, such as detailed information regarding the selected technology e.g. floor plans and elevations and visual impact. Further guidance on what information is required for each type of technology can be found in Section 5.

4. SUSTAINABLE TECHNOLOGIES

Renewable, Decentralised and Low Carbon Technologies

4.1 The Council considers renewable, decentralised and low carbon technologies to meet the requirements of Policy ENV7. These are referred to collectively as “sustainable technologies” in this SPD. The supply of energy from a green tariff scheme (i.e. sustainable energy from the grid) will not meet the requirements of Policy ENV7.

4.2 Renewable energy covers those energy flows that occur naturally and repeatedly in the environment (i.e. wind, water, sun and biomass). Low carbon technologies are those that can help reduce carbon emissions.

4.3 Decentralised energy systems produce heat as well as electricity at or near the point of consumption, making use of the substantial amount of heat that is wasted when distributing electricity around the national grid. Such systems can make use of a diverse range of renewable and low carbon technologies, including micro-renewables, and can serve an individual building, development or wider community. The electricity generated is connected to a local distribution network rather than directly to the national grid.

4.4 Feed in tariffs (FITs) are currently available for small-scale photovoltaics, wind turbines, hydroelectricity and micro CHP. In March 2011, the Government announced the introduction of the Renewable Heat Incentive (RHI) scheme, which will provide financial support for solar thermal, heat pumps and biomass heating. More information can be found at: http://www.decc.gov.uk

Solar Thermal (solar water heating)

4.5 Solar water heating systems use heat from the sun to warm domestic hot water that is stored in a tank. A conventional boiler or immersion heater is then used to provide hot water when solar energy is unavailable.

4.6 The efficiency of solar thermal and photovoltaic cells is affected by the direction faced, the tilt of the panel and any shading e.g. trees.

Photovoltaics (solar electrical)

4.7 Solar electricity systems capture the sun's energy using photovoltaic (PV) cells. The cells convert the sunlight into electricity, which can be used to run household appliances and lighting or can be fed back into the national grid.

Wind Turbines

4.8 Wind turbines harness the power of the wind. When the wind blows the blades are forced round, driving a turbine which generates electricity. Small systems known as "microwind" turbines can produce enough electricity for the lights and electrical appliances in a typical home. Because of sheltering and turbulence effects, estimated wind speed data can be unreliable in urban

areas. Therefore, a developer would need to fully demonstrate that the proposed wind turbine would actually deliver the wind output claimed.

4.9 Wind speed is critical to the performance of wind turbines. The Companion Guide to Planning Policy Statement 22: Planning for Renewable Energy (para 32) recommends that in order to fully assess wind speeds a site wind survey should be undertaken covering a period of minimum 12 months. This is to demonstrate that wind speed at a given site can support the use of a wind turbine. Noise and proximity to roads, railways, public rights of way and power lines can also limit the use of wind turbines.

Hydroelectricity

4.10 Hydroelectricity systems generate electricity from running water - usually a small stream - to turn a small turbine which generates electricity. The faster the water flows and the more water there is the more electricity can be generated. Small or "micro" hydroelectricity systems can produce enough electricity for lighting and electrical appliances in an average home. Feed in tariffs (FITs) are currently available for hydroelectricity.

4.11 Like PV and wind turbines, hydro systems can be connected to the grid. The systems need to be sited close to the point of use or to a suitable grid connection. If these systems are considered for a river or stream, an abstraction and/or impoundment license, flood defence consent and fish pass approval will be required from the Environment Agency. Riparian ownership issues may also have to be considered.

Ground Source Heating / Cooling

4.12 Ground source heating / cooling works by extracting heat or cold from the ground. Beneath the surface, the ground stays at a constant temperature which is warmer than mean winter air temperature and cooler than mean summer temperatures. A heat pump extracts solar thermal heat from the ground and moves it to an area of lower or higher temperature.

4.13 Ground source heat pumps are usually used to warm water for radiators or underfloor heating systems. They can also be used to pre-heat water before it goes into a more conventional boiler. The technology can be used to cool a building during the summer months removing the need for artificial air conditioners.

4.14 Transferring heat from the ground to a building requires a pump which itself requires electricity. The electricity use of the pump should form part of the baseline.

4.15 Access to suitable ground is required for the ground pipe systems, using either horizontal trenches or vertical boreholes. A license may be required for vertical boreholes. It is important that the system avoids tree rooting zones. A mitigation strategy will be required where buried archaeological remains are likely to be encountered. Where such remains are of national importance this type of technology may not be appropriate.

Air Source Heat Pumps

4.16 An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside, even when the outside temperature is as low as minus 15° C. There are two main types:

An air-to-water system uses the heat to warm water. The pumps heat water to a lower temperature than a standard boiler system would, so they are more suitable for underfloor heating systems than radiator systems.

An air-to-air system produces warm air which is circulated by fans to heat a home.

4.17 As with ground source heating/ cooling systems, electricity is needed to power the pump. The electricity use of the pump should form part of the baseline.

Use of Canal Water for Heating or Cooling Buildings

4.18 Canal water heating / cooling works by extracting heat or cold from water pumped from an adjoining canal using a heat exchanger, then discharging the water back into the canal.

4.19 Schemes on sites within 100m of a canal with no intervening roads, railway lines, etc. and with a likely 500kW of heat to be dissipated to the canal can usually be considered viable. Large residential schemes which are overseen by one management company with a designated energy centre/CHP plant may also have potential.

4.20 Businesses located adjoining canals can use canal water for industrial processes (consumptive) or for cooling purposes (take and return) and in many cases use both.

4.21 The Canal and River Trust should be consulted on any proposal to make use of canal water for heating or cooling. The electricity used to pump canal water should form part of the baseline. It should be noted that many canal structures are on the statutory list and that many stretches of canal are designated conservation areas

Biomass

4.22 Biomass technology uses organic materials, either directly from plants or indirectly from industrial, commercial, domestic or agricultural products to generate heat. Biomass does not include fossil fuels. Biomass products can include:

- Woody biomass – such as logs, wood chips, wood pellets and energy crops;
- Non woody biomass – such as animal waste, industrial waste and biodegradable products from food processing.

4.23 Biomass is considered to be carbon neutral as the energy released from biomass on burning is the same as that absorbed during its production. The most common forms of biomass technology are biomass boilers, where the

fuel can be fed manually or automatically. Internal or external storage areas will be required to store biomass products.

4.24 Any biomass fuel used for biomass furnaces should be capable of burning smoke free and be compliant with current legislation and guidance to ensure that air quality and amenity is not adversely impacted. Biomass technology is not suitable for all locations. It is therefore important that applicants considering such technology should contact the Council's Environmental Health Department to discuss the viability of the scheme at an early stage.

4.25 Use of locally sourced biomass is the most sustainable option. Growing plant material for biomass schemes, whilst potentially beneficial for biodiversity, may also be harmful where non-native species are used and semi-natural habitat is lost to grow biomass crops.

Combined Heat and Power (CHP) and District Heating

4.26 CHP is the use of an engine to simultaneously generate both electricity and useful heat. District heating systems distribute the heat generated through CHP or other sustainable technologies, such as biomass boilers, to residential and non-residential developments. There are various sizes of CHP systems ranging from single homes to whole districts and towns, which require district heating systems.

4.27 CHP systems can be run on traditional fossil fuels or biomass. Where they are run on fossil fuels, only the electricity generated by the plant will be classed as sustainable energy, and therefore contribute towards the minimum 10% target.

4.28 In the home, a micro CHP unit resembling a gas-fired boiler will provide heat for space and water heating and electricity to power domestic lights and appliances. Micro CHP is applicable at a street scale or for large buildings and can be a replacement for conventional domestic boilers. Homes and buildings fitted with CHP are usually also connected to the mains electricity grid, and may also retain back-up boilers. This is so that they are never short of an energy supply, for example during maintenance of the CHP plant.

4.29 To make the investment in CHP worthwhile there must be a need for both the heat and electricity produced. Large scale mixed use developments benefit the most from CHP and/or district heating systems. CHP is most effective where the generation plant is close to the users of the heat, where there are a mix of uses to even out the pattern of demand for electricity and heat through the day, and where the density and layout of development reduces the cost of installation of the necessary infrastructure and distribution of heat.

4.30 CHP systems are not suitable for all locations. It is therefore important that applicants considering such technology should contact the Council's Environmental Health Department to discuss the viability of the scheme at an early stage. CHP plants running on waste products should be located in conformance with Core Strategy Policy WM4: Locational Considerations for New Waste Management Facilities. Any biomass fuel used for biomass furnaces should be capable of burning smoke free and be compliant with current legislation and guidance to ensure that air quality and amenity is not adversely impacted.

Design Issues

4.31 There are a number of design issues associated with each sustainable technology which should be taken into consideration when assessing their feasibility and viability. Many of these are set out in Planning for Renewable Energy: A Companion Guide to PPS22. Any design issues arising from the installation of sustainable technologies for a development should be covered in the Design and Access Statement.

4.32 For individual buildings where micro-renewable technologies are used, design issues can include siting, efficiency (e.g. pitch of solar PV panel or viable wind speed), colour and appearance, noise, connection, safety and potential ecological and landscape impacts. Opportunities should be taken for small-scale technologies to incorporate beneficial features for species such as bats and birds, to help address Policy ENV1: Nature Conservation of the Black Country Core Strategy.

4.33 For groups of buildings where CHP and heat networks are used design issues can include access (for fuel provision e.g. biomass), visual intrusion, location of plant, noise from traffic and plant operations, health and local ecology, mix of uses to balance the demand for energy, installation and transmission costs, adjoining developments and heat networks and potential ecological and landscape impacts.

Heritage Assets

4.34 There are several situations where the installation of sustainable technologies will have implications for heritage assets. A heritage asset is defined as a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. Heritage assets are valued components of the historic environment. They include designated heritage assets such as Scheduled Ancient Monuments, Listed Buildings, Registered Parks and Gardens and Conservation Areas, and non designated heritage assets such as those on the Local List, other sites recorded on the Historic Environment Record and other assets identified by the local planning authority through the plan making process.

4.35 Before considering installations at heritage assets it is important to understand the special interest of the building or site and to asses the potential impact such changes might have. The following principles should be followed:

- Seek pre-application advice as soon as possible from the historic environment service;
- Obtain sufficient information about the significance of the asset to properly understand the potential impact of the proposals;
- Minimise the physical and visual impact of any installations;
- Avoid damage to the significance of the asset by minimising intervention;
- Plan installations so that they are reversible as far as possible;
- Where loss of historic fabric or features of significance is unavoidable they should be recorded in situ in advance and, where possible, either placed in storage or re-used on site, and records (in particular archaeological surveys or buildings recording) should be placed in a publically accessible archive;

- Where necessary, consents other than planning permission **must always** be obtained in advance (Listed Building Consent, Conservation Area Consent or Scheduled Monument Consent).

4.36 Further useful information and guidance regarding renewable technologies and the historic environment is provided by English Heritage at: www.climatechangeandyourhome.org.uk and www.helm.org.uk.

Information Requirements for Selected Technologies

4.37 For each technology selected to deliver the minimum 10% target, the information listed below will be required, as a minimum. This information should also be summarised in a table, as set out in Table 2 of Appendix 1.

Solar Thermal

- Description of technology
- Capacity - number of panels or tubes, total area
- Estimated energy generation (KWh/yr)
- Elevations to show proposed location
- Orientation/ roof pitch
- Roof plans and detail of roof mounting arrangement and methods of fixing, if applicable
- Potential shading from trees and other buildings
- Visual impact assessment

Photovoltaics

- Description of technology
- Capacity – electrical output (KWp)
- Estimated energy generation (KWh/yr)
- Design of the module or array
- Elevations to show proposed location
- Orientation / roof pitch
- Roof plans and detail of roof mounting arrangement and methods of fixing, if applicable
- Potential shading from trees and other buildings
- Visual impact assessment

Wind Turbines

- Description of technology
- Capacity - electrical output (KW)
- Estimated energy generation (KWh/yr)
- Layout plan showing the site size, boundary and location of infrastructure (e.g. location of turbines, sub-station, access tracks)
- Elevation plan
- Roof plan to show location of wind turbine (if roof mounted)
- Average site wind speed (minimum 12 months data) and further information to fully demonstrate that the proposed wind turbine would actually deliver the wind output claimed
- Grid connection
- Proximity to dwellings
- Noise, vibration and visual impact assessment

- For large wind turbines further information will be required, including topple zones, radar interference, microwave transmission buffers, archaeological assessment, consideration of impact on birds / bats, etc.
- Evidence of consultation with Network Rail to establish if there would be any potential impacts on rail infrastructure e.g. topple zones, cabling, vibration impacts, radio / signalling impacts, shadow flicker.

Hydroelectric

- Layout plan showing location of turbine
- Elevations and size of turbine
- Capacity – electrical output (KW)
- Estimated energy generation (KWh/yr)

Ground Source Heating / Cooling

- Description of technology (horizontal or vertical)
- Capacity - for heating and cooling (KW)
- Estimated energy generation (KWh/yr)
- Number and location of boreholes / trenches
- Location of pipework
- Connection details to the building
- Plan showing tree locations and their potential rooting zones
- Archaeological assessment, where applicable

Air Source Heat Pump

- Description of technology e.g. air-to-air, air-to-water system
- Capacity – for heating and cooling (KW)
- Estimated energy generation (KWh/yr)
- Elevations to show location and design
- Visual impact assessment
- Noise report (should be available from the manufacturer)

Use of Canal Water for Heating or Cooling Buildings

- Description of technology
- Capacity - for heating and cooling (KW)
- Estimated energy generation (KWh/yr)
- Number and location of canal extraction points
- Location of pipework
- Connection details to the building
- Evidence of consultation with the Canal and River Trust

Biomass

- Description of technology and fuel supply
- Capacity – boiler specification (KW)
- Estimated energy generation (KWh/yr)
- Floor plans and elevations showing the location and design of the plant, flue and storage facilities
- Details of vehicle access to and from the plant and estimated vehicle movements
- Source of fuel supply, principle transport routes to and from the supply
- Landscaping and visual impact of plant
- Details of noise emissions
- Details of air pollution impacts and mitigation measures

Combined Heat and Power & District Heating

- Description of technology including fuel type to be used
- Capacity – plant specification, electrical output (KWe), heat output (KWth)
- Estimated energy generation (KWh/yr) for electricity and heat separately
- Layout plan showing site size, boundary and location of infrastructure (e.g. location of boiler house, CHP units and boilers, storage area)
- Floor plans and elevations
- Details of connection to distribution network
- Noise and visual impact assessment
- Details of operation and management of installations
- Where appropriate, source of fuel supply, principle transport routes to and from the supply
- Details of vehicle access to and from the plant and estimated vehicle movements
- Details of air pollution impacts and mitigation measures

APPENDIX 1 - SUMMARY TABLES TO FORM PART OF ENERGY ASSESSMENT

Table 1: Calculating the Estimated Residual Energy Demand of a Development

Type of unit	**Estimated residual energy demand (KWh per year):**					**Total per unit**	**Number of units**	**Total**
	Space Heating	Hot water	Lighting	Appliances	Cooling			
Type 1 e.g. 4 bed detached								
Type 2 e.g. 3 bed semi-detached								
Type 3 e.g. 1 bed apartment								
(add rows as required)								
Communal Areas								
Infrastructure e.g. external lighting								
Total								***x***

Table 2: Calculating Estimated Energy Generation from Sustainable Technologies

Sustainable Technology	**Description / Capacity**	**Estimated energy generation (KWh per year)**
Technology 1		
Technology 2		
Technology 3		
(add rows as required)		
Total		

APPENDIX 2 SUSTAINABILITY APPRAISAL

1. Introduction

1.1 This Sustainability Appraisal has been prepared to accompany the SPD on Renewable and Low Carbon Energy.

2. Background and Methodology

2.1 Under the Planning and Compulsory Purchase Act 2004, a Sustainability Appraisal must be undertaken for each Local Development Document, including SPD's (NPPF Para 1.65). The purpose of the SA is to promote sustainable development by examining how the policies and proposals of the SPD / LDD contribute to the aim of sustainable development. By identifying any issues at an early stage it is possible to amend the guidance to ensure that it is as sustainable as possible.

2.2 The sustainability appraisal methodology currently used by Wolverhampton City Council accords with advice contained in "Planning for Sustainable Development: Towards Better Practice"(1998) and the NPPF. The procedure is based on the approach taken to Sustainability Appraisal of the adopted UDP. The three defined strategic criteria or "assets" are:

- Environment
- People and Society
- Economic Well Being

2.3 Within the UDP sustainability appraisal there are a total of 22 objectives: 12 under the environmental heading; 6 under the people and society heading; and 4 under the economic wellbeing heading. These have been supplemented by revised objectives identified in connection with work in conjunction with the Black Country Core Strategy. The objectives have been used to create a matrix for purposes of the appraisal (see Table 1).

3 Options

3.1 This appraisal tests two options against the set of sustainability objectives, to determine whether the SPD will contribute positively to delivering sustainable communities within the City.

Option 1: Core Strategy Policy ENV7 and national guidance provide the main basis for decisions on delivering sustainable communities in Wolverhampton.

Option 2: An SPD on Renewable and Low Carbon Energy is adopted to add value to the existing policies at local and national level.

4 Results

Option 1

4.1 Option 1 relates to Core Strategy Policy ENV7: Renewable Energy and supporting text. This policy was subject to a sustainability appraisal through the Black Country Core Strategy at Preferred Options, Publication and Submission stages.

4.2 The benefits of Policy ENV7 are social, economic, and environmental. Lower energy bills can support local businesses and deprived communities, and the growth of renewable and low carbon forms of energy generation in the City will reduce climate change effects, limit dependence on more unstable energy sources and help developers prepare for the introduction of zero carbon building regulations standards from 2016 onwards.

Option 2

4.3 The detailed proposals set out in this SPD have also been considered against each of the criteria listed in the matrix, as set out in Table 1. The overall effects are the same as for Option 1. The principal benefits of this Option are likely to be in terms of clarifying Core Strategy Policy ENV7 and providing detail on the information to be submitted with planning applications, including the Energy Assessment. The SPD also provides guidance on design considerations, including heritage and historic environment issues, to ensure that introduction of renewable and low carbon technologies does not have any adverse environmental effects.

5 Conclusions

5.1 The SPD will create no change in the overall effects on criteria produced by Core Strategy Policy ENV7: Renewable Energy. The effects of this policy were positive in all respects.

Table 1- Sustainability Appraisal Matrix for Renewable and Low Carbon Energy Supplementary Planning Document

Sustainable Development Aim	Impact of SPD						Comments	Indicator used
	- -	-	0	?	+	+ +		
1. Environment								
Make optimum use of land			✓				N/A	N/A
Reduce traffic congestion and promote sustainable modes of transport into and throughout the City.			✓				N/A	N/A
Protect and enhance the quality of the built environment					✓		The SPD covers design considerations, including heritage assets and historic environment issues, and will ensure that the introduction of renewable and low carbon technologies does not result in adverse environmental impacts.	Various indicators within design and access statements.
Protect and enhance the historic environment					✓		The SPD covers design considerations, including heritage assets and historic environment issues, and will ensure that the introduction of renewable and low carbon technologies does not result in adverse environmental impacts.	Best practice is to protect and retain existing features, and enhance through strong interpretation.
Minimise air, water, soil light and noise pollution levels and create good quality air, water and soils.					✓		The SPD covers design considerations, including air quality issues, and will ensure that the introduction of renewable and low carbon technologies does not result in adverse environmental impacts.	Various indicators within design and access statements.
Protect and enhance water quality and encourage water conservation			✓				N/A	N/A

Sustainable Development Aim	Impact of SPD						Comments	Indicator used
	- -	-	0	?	+	+ +		
Protect flood plains and water courses			✓				N/A	N/A
Value, maintain, restore and re-create biodiversity.			✓				N/A	N/A
Maximise the efficient use of minerals			✓				N/A	N/A
Reduce waste and maximise opportunities for recycling and waste management.						✓	The SPD recognises the potential to make use of waste to generate energy in a variety of ways.	Provision of recycling facilities within developments. Cubic metres of construction waste Going to landfill.
Plan for the anticipated levels of climate change. (Adapting to expected climatic effects)			✓				N/A	N/A
Minimise the City's contribution to climate change. (Mitigating against expected climatic effects)						✓	Promotion of renewable energy, and helping developers to plan effectively for future changes to building regulations, will help to reduce CO2 emissions within the City.	Proportion of eligible developments delivering measures sufficient to off-set at least 10% of estimated residual energy demand. Renewable energy generation in the City as a whole.
2. People and Society								
To safeguard and improve community health, safety and well being					✓		There are strong proven links between substandard housing and poor health. Those in housing need are most likely to live in substandard accommodation. The provision of new housing which has lower energy costs and a more secure energy supply will contribute towards a positive health impact on all future residents.	Monitoring of health conditions related to poor housing

Sustainable Development Aim	Impact of SPD						Comments	Indicator used
	- -	-	0	?	+	+ +		
Enhance education opportunities for all			✓				N/A	N/A
Encourage the provision of environmentally sound, affordable housing for all.						✓	Significant contribution to the creation of sustainable communities throughout the City by securing the provision of sustainably designed, housing, with low energy costs, and increasing the capacity of developers to meet future changes to building regulations.	Number of new units meeting Level 3+ of the "CSH" or Eco-homes very good
Ensure easy and equitable access to services, facilities and opportunities.			✓				N/A	N/A
Maintain and improve safety, perception of safety and community well being.			✓				N/A	N/A
Economic Wellbeing								
Supporting and growing local economy by fostering an advanced manufacturing sector with a competitive services sector					✓		Support local businesses by ensuring new and improved premises have lower energy costs.	Gross Value Added per capita. Percentage of companies surviving 3 yrs & reporting innovative activity.
Support a stable and growing regional economy and regeneration initiatives					✓		Support local businesses by ensuring new and improved premises have lower energy costs.	Increase in GVA per capita.
Encourage sustainable industries					✓		Support local businesses providing renewable and low carbon energy services to developers.	Percentage of new businesses within identified employment clusters, regeneration zones, and High Technology corridors.

Sustainable Development Aim	Impact of SPD						Comments	Indicator used
	- -	-	0	?	+	+ +		
Enhance social inclusion and develop a more equitable balance of prosperity across the city					✓		Lower energy costs for new developments, including affordable housing, will support social inclusion.	Regular Housing Needs Survey to monitor levels of housing need for different sectors of society
To reduce poverty, crime and social deprivation, and secure economic inclusion. (Equality)					✓		Lower energy costs for new developments, including affordable housing, will support social inclusion.	Economic studies. Reduction in numbers unemployed. Increase in number and choice of local jobs.

GLOSSARY

BRE
Building Research Establishment Group

BREDEM
Building Research Establishment Domestic Energy Model - A model developed by BRE for the calculation of the annual energy requirements of domestic buildings, and for the estimation of savings resulting from energy conservation measures.

CIBSE
Chartered Institution of Building Services Engineers

DECC
Department for Energy and Climate Change

DEFRA
Department for Environment, Food and Rural Affairs

Feed-in Tariff (FIT)
An established scheme whereby a subsidy is paid to those who have invested in technologies that produce electricity, such as photovoltaics, wind turbines and micro hydro. The level of tariff depends on the type of technology and the situation of the building owner. The majority of funds are paid on the basis of the electricity generated, regardless of whether it is used or exported back to the grid.

Renewable Heat Incentive (RHI)
This is a scheme which provides a tariff similar to the FIT for those who have installed renewable technologies for heating such as solar thermal, biomass and heat pumps.

Simplified Building Energy Model (SBEM)
Calculations for non-domestic buildings to estimate energy demand and CO2 emissions of the building using the standard national methodology.

Standard Assessment Procedure (SAP)
Calculations for domestic buildings to estimate the energy demand and CO2 emissions of the building using the standard national methodology.

Sustainable Technologies
A term used in this SPD to refer collectively to renewable, decentralised and low carbon technologies, which are all suitable to meet the 10% renewable energy requirement set out in Black Country Core Strategy Policy ENV7.

Energy Benchmarks (TM46:2008)
This is a document produced by the CIBSE in 2008 which describes the statutory building energy benchmarks prepared to complement the Operational Rating procedure developed by the Department for Communities and Local Government (CLG) for Display Energy Certificates under The Energy Performance of Buildings Regulations 2007.