

18. Using Resources Efficiently

- 18.1 Local planning policies can help shape and design places with lower carbon emissions and renewable energy technologies, which are ‘future-proofed’¹ from the effects of climate change. ‘Future proofing’ development includes:
- minimising the use of natural resources;
 - reducing water run-off from hard surfaces and managing flood risk areas;
 - generating less waste from development; and
 - managing pollution.
- 18.2 The benefits of reducing carbon emissions, adapting the built environment and mitigating the effects of climate change include:
- reduced heating and electricity bills due to better insulation and more efficient appliances;
 - less reliance on fossil fuels;
 - support for the local economy by increased use of locally sourced sustainable materials;
 - reduced water consumption;
 - ‘greening’ the built environment through biodiversity enhancements;
 - reduced ‘heat stress’² in urban environments; and
 - an improved quality of life and feeling of well-being.
- 18.3 Key legislative and statutory directives aim to reduce carbon dioxide (CO₂) emissions globally by at least 50% by 2050. In the UK, the Climate Change Act (2008) has committed the Government to reducing CO₂ emissions by 26% by 2020 and all greenhouse gas emissions by 80% by 2050 (both from a 1990 baseline).
- 18.4 National mandatory standards, such as those provided for dwellings by the Code for Sustainable Homes, will apply to all building types. National policy is evolving and further change is expected, including amendments to Building Regulations to tighten standards.
- 18.5 The Council will aim to locate and design new development so as to optimise its carbon performance and to support the supply of decentralised, renewable and low carbon energy sources. The Regional Spatial Strategy (2008) set a target of generating 10% of the region’s energy from renewable sources by 2010 and 17% by 2020 (excluding offshore wind). To help cut water consumption from 150 litres per person per day, it also set targets for a 25% reduction in new development and 8% in existing development on 2006 rates.

¹ ‘future-proofed’ – protecting for the future

² ‘heat stress’ - an increase in air temperature from the absorption and retention of heat by hard and dark surfaces in urban environments

- 18.6 The Council signed the Nottingham Declaration on Climate Change in 2007, and committed to tackling climate change in the Dacorum Sustainable Community Strategy.
- 18.7 The energy performance of the borough has shown that, despite progress on the reduction of domestic energy consumption, there is a need to make improvements to domestic energy consumption, the existing housing stock, new development and renewable and decentralised energy for the built environment.
- 18.8 Over the 10 years from 1996, domestic consumption fell by more than 20%, in line with targets. This was achieved mainly through cheap insulation and efficiency measures, but it is estimated that more expensive measures will be needed from around 2015 onwards in order to maintain momentum. The borough has below South East region average annual per head domestic energy consumption - gas consumption is 10% lower and electricity 13% lower (Low and Zero Carbon Study 2010). Consumption is also below most other regional averages in the country.
- 18.9 Nearly 30% of carbon emissions arose from energy use in Dacorum's homes. Yet, there were very few examples of private development in the borough in 2011 that had been built to reduce these emissions through energy standards above the 2006 Building Regulations Part L, such as the Code for Sustainable Homes or BREEAM³.
- 18.10 In 2011 there were no significant examples of renewable energy generation in the borough, apart from a few small-scale wind turbines generating only a small amount of electricity.

Carbon Emissions and Renewable Energy

- 18.11 The Council's approach to carbon emissions and renewable energy will be guided by the Energy Hierarchy (Figure 16). This means that carbon emission reductions will be delivered primarily through improvements to the energy efficiency performance of the building fabric and ensuring that carbon emissions reductions are 'future-proofed' for the life of the development. This will include improving the air-tightness of the building, before resorting to renewable energy technologies in order to meet carbon emission targets.
- 18.12 Government policy intends that all new buildings should be built to a zero carbon standard within the next ten years, and at some point afterwards new development should normally have a neutral carbon impact. Minimum standards or targets will be identified through the Building Regulations and the Code for Sustainable Homes or equivalents. The pace of change and level of compliance will depend on:
- the timing of Government regulation or advice;
 - the opportunity (to exceed the minimum); and
 - cost affecting viability of schemes.

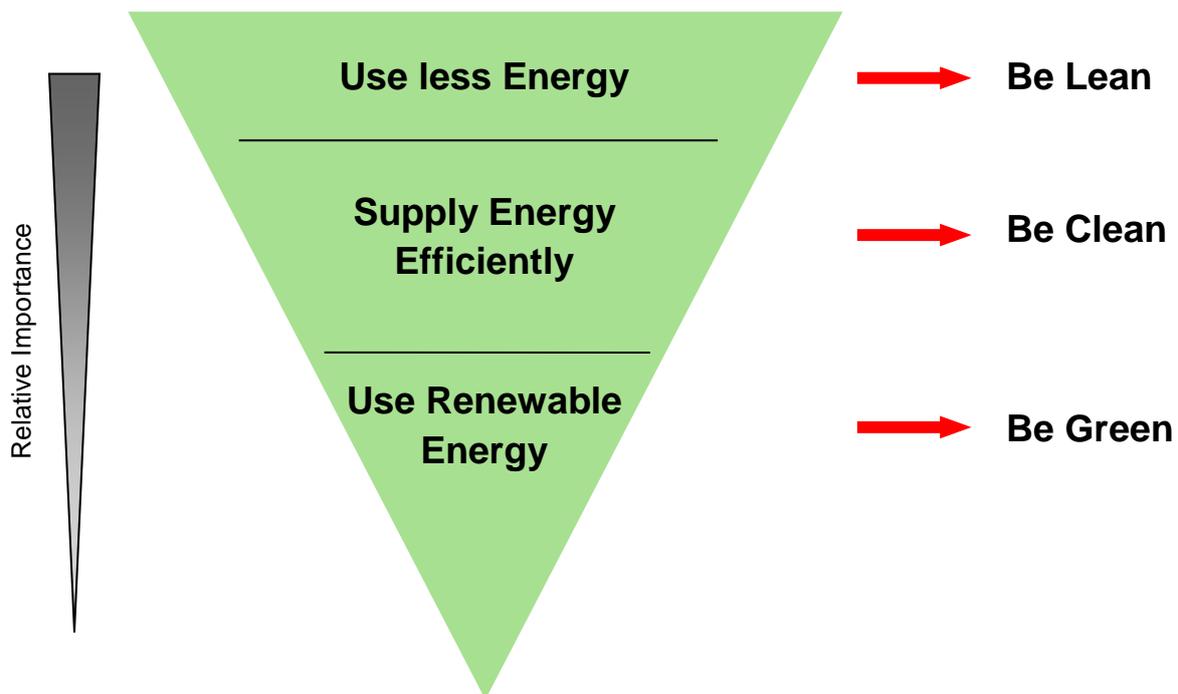
³ Building Research Establishment Environmental Assessment Methods - www.breeam.org/

Opportunity is related to size of scheme and location. There are opportunities in Dacorum to exceed the minimum pace of change, particularly for larger developments and where heat and energy demands will be relatively high.

18.13 Zero carbon buildings will be achieved through control of building design and construction (e.g. the amount of insulation). This covers regulated emissions and is shown as Stage 3 in Table 10 Carbon neutral status can be reached, if, in addition, occupiers manage how they use their buildings and appliances (i.e. unregulated emissions) particularly carefully. If specific targets cannot be met, there are allowable solutions which can be used to compensate.

18.14 The Council has adopted a progressive approach which minimises carbon dioxide emissions. The Council will accept the delivery of standards/targets in Table 10 and any supplementary guidance, as minimising CO₂ emissions. Standards and targets will be used as guidelines, allowing a degree of flexibility so as not to prevent necessary development.

Figure 16: Energy Hierarchy



18.15 The 'Low and Zero Carbon Study'⁴ mapped CO₂ emissions, levels of demand for electricity and heat, and opportunities and constraints for decentralised energy. Areas of high energy demand and CO₂ emissions from existing buildings are concentrated in the higher density areas of major settlements. The Study therefore suggested opportunities for district heating in the borough's town centres and Maylands Business Park and through any large-scale greenfield development. It also suggested opportunities to harness wind power. Natural opportunities for wind power

⁴ Low and Zero Carbon Study, 2010 – a technical document supporting the Core Strategy

are in the countryside, particularly in the Green Belt (see Map 4): they are constrained by environmental policies (e.g. Policies CS5 and CS24).

- 18.16 The Council considers that District Heating Opportunity Areas and Combined Heat and Power (CHP) should be pursued in high density areas targeted for regeneration (see Map 4). Systems could be powered by local biomass⁵ and appropriate waste that is not being recycled for other purposes. Micro-generation technologies, particularly solar water heating, photovoltaics and heat pumps will also help reduce carbon emissions. Within identified District Heating Opportunity Areas, major new development (10 dwellings and above/1000sqm of non-residential and above) will be expected to deliver networks of district heating to help the borough meet renewable energy targets and to improve energy efficiency. Smaller developments in or close to District Heating Opportunity Areas should consider delivering suitable technologies to enable connection to district heating networks in the future.
- 18.17 More detailed guidance about District Heating Opportunity Areas and Wind Opportunity Areas will be given in a Supplementary Planning Document.

⁵ Biomass – waste timber, crops, plants and sustainably sourced trees used to fuel wood burners, district heating systems and combined heat and power (CHP)

Opportunities for Renewable Energy

Map 4

KEY

- Opportunities for:
 - 1. Wind Turbines
(because of prevailing wind conditions)
 - 2. District Heating
(because of heat demand and density/scale of development)
 - a) within existing urban areas
 - b) at local allocations



Source: Hertfordshire Climate Change and Planning Study 2010 - AECOM

 Scale 1:110000
@ A4

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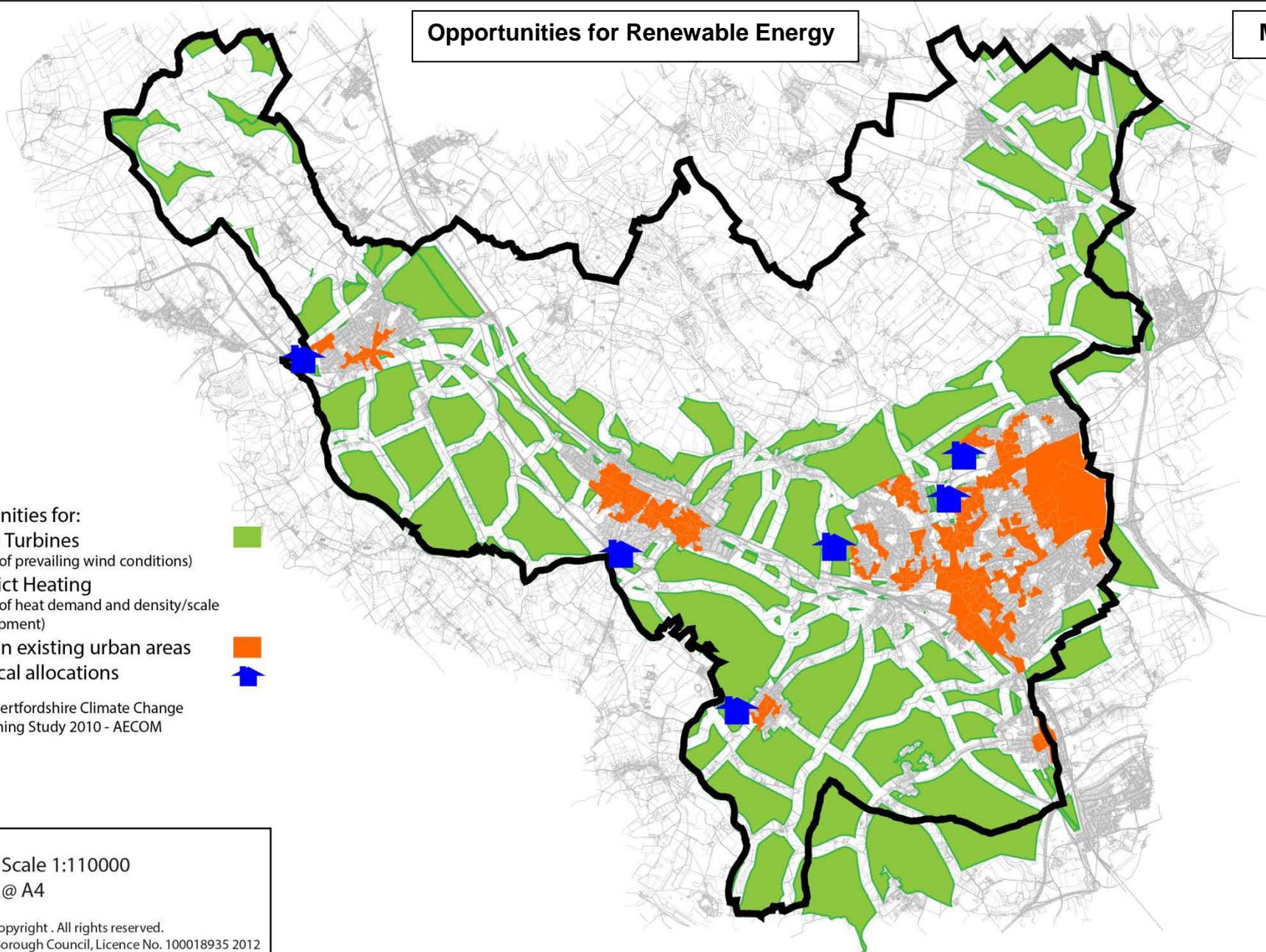


Table 10: Progress towards Zero Carbon in New Development

Location	Stage 1 - 2011	Stage 2**	Stage 3 onwards***
For development <5 dwellings or non-residential development <235sqm			
Whole Borough	A minimum of Code Level 3 (or equivalent) for residential development. Comply with Part L2A* 2010 Building Regulations as a minimum for non-residential development.	A minimum of Code Level 4 (or equivalent) for residential development. Comply with Part L2A 2013 Building Regulations as a minimum for non-residential development.	
For development ≥5 dwellings or non-residential development ≥235sqm			
Whole Borough except DHOAs	As above, plus an additional 5% CO ₂ reductions for residential and non-residential development as a minimum.	As above, plus an additional 5% CO ₂ reductions for residential and non-residential development as a minimum.	Progression through Code Levels 5 and 6 (or equivalent) for residential development. Comply with equivalent Building Regulations or standards as a minimum for non-residential development.
Inside DHOAs	A minimum of Code Level 4 or equivalent for residential development. Comply with Part L2A 2010 Building Regulations plus an additional 25% CO ₂ reductions as a minimum for non-residential.	A minimum of Code Level 5 (or equivalent) for residential development. Comply with the CO ₂ reductions associated with Code Level 5 (or equivalent) for non-residential development as a minimum.	

Notes:

* Building Regulations Part L2A relates to new non-residential development.

** This requirement will come into effect when the next update to Part L 2010 is published that is equivalent to Code Level 4 energy improvements i.e. expected to be Part L 2013.

*** These requirements will come into effect with successive updates to Part L 2013 of the Building Regulations (or equivalent) so that energy improvements equal to Code Level 6 or zero carbon can be achieved.
DHOA District Heating Opportunity Area
References to Code Levels relate to the Code for Sustainable Homes.

Sustainable Design and Construction

- 18.18 Sustainable building design and construction is an essential part of the Council's response to the challenges of climate change, natural resource depletion, habitat loss, and wider environmental and social issues.
- 18.19 The way in which buildings are designed, constructed, operated and decommissioned has significant impacts on the built and natural environment, and requires major resource inputs such as energy, water and materials. Designing and constructing buildings which help to minimise the consumption of these resources and minimise construction waste from decommissioning buildings, can, not only, reduce the borough's carbon footprint, but also reduce costs for developers and occupiers. Site waste management plans will help by encouraging reuse of materials, reduction of waste and recycling. Where practical, developers should be considering the refurbishment of existing buildings before demolition. New development should provide the necessary physical infrastructure, including drainage and sewerage: developers should ensure that there is sufficient capacity at the relevant wastewater treatment works (see Section 28).
- 18.20 The layout of development will be required to make the most effective use of land depending on the site's slope, existing and desired pedestrian and highway accesses, and environmental and brownfield constraints, such as floodplains, rivers, mature trees and contaminated land issues. The orientation and shading of buildings will need to maximise the energy efficiency of the buildings where possible. This will avoid the need for additional energy consumption for heating or cooling purposes. Decentralised energy technologies used to heat and provide electricity to the development will need to be suitable for the site layout, design principles and any observed constraints.
- 18.21 Sustainable design includes measures such as the planting of native species, the nature of landscaping, "green" roof design, water management and the provision of nesting sites or roosts. These are recommended to help sites link with wildlife corridors and the wider natural environment. Enhanced biodiversity will improve the quality of life and property values, as well as delivering ecological benefits. While all living plant matter absorbs carbon dioxide, trees process more due to their large size and extensive root structure. One hectare of woodland can absorb emissions, the equivalent of 100 family cars (with high emissions). Trees can also remove sulphur dioxide from the atmosphere, attenuate noise, provide natural air conditioning and shade, and moderate the rate of water run-off through rainfall attenuation, which reduces the risk of flooding. Therefore, new development will be expected to retain

and replace existing trees, and help to plant more trees to expand the tree canopy in the borough.

18.22 Developers will be expected to complete a Sustainability Statement and carbon compliance check in support of their proposals. When the appropriate carbon reductions would not be delivered on site, appropriate compensation will be sought. This will be in the form of sustainability offsetting measures. What will constitute appropriate offsetting measures is expected to evolve over the plan period: Government regulation and policy will guide what measures may be feasible. The Council will provide further guidance on offsetting, keeping its approach up-to-date. Offsetting may involve a direct contribution on another site (e.g. through tree planting). It may involve a contribution to a Sustainability Offset Fund, perhaps via the community infrastructure levy. The Council may be able to add other resources to the Sustainability Offset Fund. The fund can then be used to support measures which reduce carbon emissions in the existing building stock, fix or absorb carbon (for example, by planting trees) and support on and off-site renewable energy supply and efficiency measures. Tree planting and other initiatives will help to enhance biodiversity, improve quality of life and reduce 'heat stress' in built up areas.

18.23 Allowable solutions to deliver zero carbon and carbon neutral development (see Table 10) may include:

- carbon reductions on-site, through energy efficiency, low carbon and zero carbon technologies or on-site generation;
- connection to a district heating network;
- reduction of unregulated emissions through energy efficient appliances etc.;
- exporting low carbon or renewable heat from the development site to other developments; and
- investing in low and zero carbon community heat infrastructure.

Some of these measures can contribute to offsetting.

18.24 Further advice will be provided to

- explain the Council's phased approach to zero carbon and carbon neutral developments;
- support offsetting and the implementation of the Sustainability Offset Fund; and
- give further consideration to the allowable solutions required.

Hertfordshire's Building Futures Design Guide⁶ provides practical case studies and is an evolving best practice guide for new development.

⁶ Building Futures Design Guide - www.hertslink.org/buildingfutures

POLICY CS28: Carbon Emission Reductions

Carbon emission reductions will be sought in the generation and use of energy, building design and construction, and the use of transport as far as possible.

Targets and opportunities for generating renewable electricity and heat will be set out in further guidance.

Policy CS29 addresses design and construction and Policy CS8 transport. A Sustainability Offset Fund will be used to help reduce carbon emissions and/or enable carbon fixing (see Policy CS30).

POLICY CS29: Sustainable Design and Construction

New development will comply with the highest standards of sustainable design and construction possible. The following principles should normally be satisfied:

- (a) Use building materials and timber from verified sustainable sources;
- (b) Minimise water consumption during construction;
- (c) Recycle and reduce construction waste which may otherwise go to landfill.
- (d) Provide an adequate means of water supply, surface water and foul drainage;
- (e) Plan to limit residential indoor water consumption to 105 litres per person per day until national statutory guidance supersedes this advice;
- (f) Plan to minimise carbon dioxide emissions;
- (g) Maximise the energy efficiency performance of the building fabric, in accordance with the energy hierarchy set out in Figure 16;
- (h) Incorporate at least one new tree per dwelling/per 100sqm (for non residential developments) on-site;
- (i) Minimise impacts on biodiversity and incorporate positive measures to support wildlife;
- (j) Minimise impermeable surfaces around the curtilage of buildings and in new street design;
- (k) Incorporate permeable and lighter coloured surfaces within urban areas; and
- (l) Provide on-site recycling facilities for waste.

Buildings will be designed to have a long life and adaptable internal layout. Applicants will therefore need to explain how:

- (i) they have considered the whole life cycle of the building and how the materials could be recycled at the end of the building's life; and
- (ii) their design has been 'future proofed' to enable retrofitting to meet tighter energy efficiency standards and connection to decentralised community heating systems.

For specified types of development applicants should provide a Sustainability Statement.

Where new development cannot meet on-site energy or tree planting requirements, the applicant will be expected to contribute towards sustainability offsetting if at all possible (see Policy CS30).

If a scheme would be unviable or there is not a technically feasible approach, the principles in this policy may be relaxed.

POLICY CS30: Sustainability Offsetting

The contribution of development towards sustainability offsetting measures will be determined in accordance with prevailing regulation and planning policy. Offsetting may include off-site work and planting, and contributions to a Sustainability Offset Fund.

Details on the Council's approach to sustainability offsetting, including the operation of the Sustainability Offset Fund, will be set out in further guidance.

Monitoring:

Indicator(s)	Target(s)
Proportion of new homes in district heating opportunity areas reaching set levels in the Code for Sustainable Homes or equivalent (see Table 10)	-
Proportion of carbon savings from new development (measured in tonnes of carbon dioxide)	-
Proportion of new homes designed to reduce water consumption to 105 litres per person per day	-
Proportion of household waste that is recycled	-
Number of new homes built with on-site generation of renewable energy (for heat and electricity)	-
Capacity of renewable energy generation (for heat and electricity)	-
Money received for the Sustainability Offset Fund and spent	-

Delivery will be achieved by:

- identifying key sites for decentralised renewable energy in the Site Allocations DPD;
- developing policy in the Development Management DPD and other guidance;
- requiring sustainability statements and using a carbon compliance tool;
- adherence to the Joint Municipal Waste Management Strategy;
- compliance with Building Regulations;
- using a Sustainability Offset Fund;
- public and private partnership to deliver community-scale infrastructure; and
- joint working with the Council's Energy Conservation team and the Home Energy Conservation Association (HECA).

Sustainable Resource Management

18.25 Development must be carried out in a sustainable way to protect natural resources for use by future generations, and to adapt against and mitigate impacts of climate change. Natural resources including high quality agricultural land, mineral reserves⁷ and water supplies will be safeguarded and all new development will be expected to:

- minimise waste on-site;
- maximise recycling measures;
- consider opportunities for biomass production for renewable energy generation;
- avoid pollutants into the wider environment;
- remediate contaminated land;
- protect and enhance natural features of importance, including wildlife and landscapes; and
- consider the overall carbon footprint of materials used and use locally produced materials and sustainably sourced materials, wherever possible.

18.26 The land is generally stable. Past evidence of chalk mining is very localised, though that will affect construction.

Water Management

18.27 The east of England is the driest area in the country receiving only two thirds of the average UK annual rainfall. The effects of climate change and housing growth in the region will result in water becoming a more precious commodity. It will therefore need to be used more sparingly through the application of water efficiency measures in new and existing development.

18.28 Protection of water resources also assists in the retention of often fragile ecosystems, susceptible to the availability and flow of water. Frequent, extreme weather events are also a consequence of climate change. Heavy, frequent rainfall and long dry spells impacts on river levels and flows, creating pressure on underground drainage systems and affecting the level of rainfall left to recharge groundwater sources.

18.29 Sustainable drainage systems will help reduce and manage surface water run-off, improve water quality, and provide opportunities for nature conservation. Other complementary measures, such as rainwater storage, rainwater recycling, use of green roofs and the use of permeable surfaces will be sought.

⁷ Mineral reserves – refers to clay reserves at Bovingdon Brickworks, and sand and gravel belt around Kings Langley and any other areas that may be defined in Hertfordshire County Council's Minerals and Waste Development Framework.

18.30 New building will be directed away from areas vulnerable to flooding. A Strategic Flood Risk Assessment, incorporating the sequential approach to flood risk and agreed with the Environment Agency, informed the selection of the main areas for development in Dacorum. Most development will be accommodated outside Flood Zones 2 and 3 (the main areas vulnerable to flooding), but there will be some exceptions. For example, redevelopment and change will occur in central areas such as Hemel Hempstead Town Centre. Any new development in Flood Zones 2 or 3 must provide appropriate mitigation measures to reduce the cause or risk of flooding and avoid any adverse impact on the quality of the groundwater source or a risk to the public water supply. Some types of development (such as those categorised as 'Less Vulnerable' and 'Water Compatible') may be appropriate within Flood Zone 3.

18.31 A 'Water Cycle Study Scoping Report'⁸ examined the condition of the existing distribution network and waste water treatment works and whether they would be able to cope with additional development growth. The study concluded that further work would be necessary to establish:

- 1) if Maple Lodge or Blackbirds Waste Water Treatment Works would need to increase the Dry Weather Flow consent and introduce new physio-chemical standards; and
- 2) how extensive the upgrades need to be to the sewerage networks throughout Hemel Hempstead and Kings Langley; and
- 3) whether any other sewerage upgrades were needed within the wider south and west Hertfordshire area.

The local authorities and stakeholders involved will continue to plan for the necessary upgrades. This will be progressed with the Site Allocations DPD.

18.32 The Council will work with its partners to help:

- restore river flows;
- support the Grand Union Canal system (and its reservoirs);
- restore natural habitats along the chalk streams and in Boarscroft Vale;
- support biodiversity;
- retain water in the catchment area;
- recharge the aquifer;
- limit the effect of variable rainfall and reduce the risk of flooding;
- provide sufficient capacity for foul water drainage;
- increase the efficiency of water use, in part through sustainable design and construction; and
- provide sufficient water for people and to support agriculture.

⁸ Water Cycle Study Scoping Report, 2010 - a technical document supporting the Core Strategy, commissioned by Dacorum Borough Council, Three Rivers District Council, St. Albans City & District Council, Welwyn Hatfield Borough Council and Watford Borough Council, with the support and involvement of the Environment Agency, Thames Water Utilities and Veolia Water Central.

Pollution and Waste Management

- 18.33 The planning system plays a key role in the location and standard of development. Together with other consent regimes and processes, it can limit the impact of (and prevent) polluting emissions – i.e. noise, light, fumes, chemicals, noxious and hazardous substances and waste in general. Standards set nationally should continue to be achieved. When standards become more stringent, efforts must be made to enhance the quality of the air, water and/or soils.
- 18.34 In Dacorum special consideration needs to be given to:
- the quality of the groundwater supplying the chalk aquifer;
 - protecting the habitat and biodiversity of chalk streams;
 - the maintenance of higher quality agricultural areas and the sand and gravel belt;
 - limiting the effects of noise and air pollution along major routes (i.e. road, rail and aircraft from Luton Airport);
 - retaining tranquil parts of the Chilterns Area of Outstanding Natural Beauty and Boarscroft Vale; and
 - the risks associated with Buncefield Oil Terminal.
- 18.35 The planning system has a role to play in the minimization of waste at or near source and in the disposal of household, commercial and construction waste. Unnecessary waste should be reduced and managed nearer to its source. To avoid unnecessary waste going to landfill sites, developers will be expected to avoid potentially polluting developments, the creation of additional waste, and the location of new development near existing sources of pollution. Where waste is unavoidable it will need to be transferred and managed. Waste recycling and management will be appropriate in many General Employment Areas. New facilities may be provided through the relocation of the existing Household Waste Recycling Centre and Waste Disposal Centre in East Hemel Hempstead.
- 18.36 Hertfordshire County Council is the Waste Disposal Authority and the Waste Planning Authority for Dacorum. The Waste Core Strategy and Development Management Policies, and Waste Site Allocations documents form part of the Minerals and Waste Development Framework for Hertfordshire. The Development Plan Documents on waste set out the County Council's overall vision and strategic objectives for waste planning and establish the broad locations for strategic waste facilities: they also allocate sites, indicate areas of search for future waste uses and contain minerals and waste safeguarding areas. The Framework will be used as a basis for future waste planning, and in the determination of planning applications.
- 18.37 Air quality within Dacorum is generally good, with the main source of air pollution being from traffic emissions, specifically nitrogen dioxide. In 2012 three areas were designated as Air Quality Management Areas (AQMAs) because levels of nitrogen dioxide exceeded air quality standards : i.e.

- Lawn Lane, Hemel Hempstead;
- London Road, Apsley, Hemel Hempstead; and
- High Street, Northchurch.

The number and extent of AQMAs will change as a result of mitigation measures and continued monitoring of air quality.

18.38 Action plans will highlight mitigation measures for each AQMA. The planning system will be used to support these action plans. It does not necessarily follow that development would be harmful in an area of poor air quality or that it should be banned in an AQMA. Here, the type, scale and location of development and its traffic generation will be managed sensitively. Greater weight will be given to the consideration and removal of air pollutants.

POLICY CS31: Water Management

Water will be retained in the natural environment as far as possible. Measures to restore natural flows in the river systems and the water environment will be supported. Supply to the Grand Union Canal will be maintained.

Development will be required to:

- avoid Flood Zones 2 and 3 unless it is for a compatible use: Flood Risk Assessments must accompany planning applications for development in these areas, explaining how the sequential approach to development has been taken into account and outlining appropriate mitigation measures;**
- minimise water runoff;**
- secure opportunities to reduce the cause and impact of flooding, such as using green infrastructure for flood storage;**
- secure opportunities to conserve and enhance biodiversity; and**
- avoid damage to Groundwater Source Protection Zones.**

POLICY CS32: Air, Soil and Water Quality

Development will be required to help:

- support improvements in identified Air Quality Management Areas and maintain air quality standards throughout the area;**
- maintain soil quality standards and remediate contaminated land in line with Environment Agency, Defra and Natural England guidance; and**
- improve water quality standards in line with the Water Framework Directive, Environment Agency and Natural England guidance.**

Any development proposals which would cause harm from a significant increase in pollution (into the air, soil or any water body) by virtue of the emissions of fumes, particles, effluent, radiation, smell, heat, light, noise or noxious substances, will not be permitted.

Advice on the storage and handling of hazardous substances will be taken from the Health and Safety Executive.

Monitoring:

Indicator(s)	Target(s)
Percentage of new dwellings built on floodplains and/or contrary to Environment Agency advice	0
Change in extent and air quality of Air Quality Management Areas	-

Delivery will be achieved by:

- the restriction of development around the Buncefield Oil Depot through the East Hemel Hempstead AAP;
- the Development Management DPD;
- application of the Planning Obligations SPD;
- use of sustainability statements;
- partnership working with the Council's Environmental Health Department, the County Council, the Countryside Management Service and with external agencies and water authorities, such as the Environment Agency, Thames Water and Affinity Water (formerly Veolia Water);
- air quality monitoring undertaken across the borough;
- monitoring standards set by external agencies; and
- action plans for designated Air Quality Management Areas.