



**Renewable Energy and Low Carbon Development Study**

London Borough of Enfield

March 2010

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Rev No	Comments	Date
1	Outline Draft issued to client	25/09/09
2	Updated outline Draft issued to client	08/10/09
3	Draft report issued to client	21/12/09
4	Final Draft issued to client	26/01/10
5	Final Draft reissued with amendments and updated maps	05/03/10
6	Final Report Issued	23/03/10

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Job No: 60102479  
Reference: Enfield PPS1 Study  
Date Created: 23/03/10

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## Executive Summary

# Executive Summary

## 1. Introduction

This Renewable Energy and Low Carbon Development Study was undertaken as part of the evidence base for the Local Development Framework (LDF). It is intended to support the reduction of carbon dioxide (CO<sub>2</sub>) emissions from residential and non-domestic buildings in Enfield and increase in the supply of energy from renewable and low carbon sources.

The aims of the study are as follows:

- Identify the renewable and low carbon energy resources in the Borough;
- Assess the feasibility and viability of setting targets aimed at delivering decentralised renewable and low carbon energy in new and existing buildings;
- Propose planning policies which are supported by a sound evidence base;
- Identify delivery vehicles and funding sources to enable the opportunities to be realised; and
- Suggest mechanisms for implementing and monitoring the proposed policies.

## 2. Policy Context

International, European and national policy commit the UK to reducing its impact on climate change and increasing the supply of energy from renewable and low carbon sources. These commitments are reflected in existing and proposed national and regional policy and need to be translated into local policy and action.

Planning has a significant role to play in meeting these commitments by understanding the local potential for renewable and low carbon technologies, identifying suitable locations for renewable and low-carbon energy technologies and supporting infrastructure and setting standards for new development.

The Supplement to Planning Policy Statement 1 and Planning Policy Statement 22 (2004) define the role of planning in the response to climate change and the development of renewable and low carbon energy supplies.

Enfield Council has a broader role to lead and facilitate action across the Borough. It enforces the provisions of the Building Regulations and is responsible for promoting energy efficiency in the existing building stock as well as providing financial incentives and support. In addition, the Council has a duty to manage the climate change impacts of its own estate and services.

The 2004 and 2008 Planning Acts, PPSs and other policy and legislation empower local authorities to fulfil this role. The Well-being Power, introduced in the 2000 Local Government Act, is particularly significant, enabling local authorities to “do anything they consider likely to promote the economic, social and environmental well-being of their area unless explicitly prohibited elsewhere in legislation.”

The proposed updates to Building Regulations planned for April 2010, 2013 and 2016 will incorporate increasingly stringent targets relating to energy consumption and CO<sub>2</sub> emissions. These proposals lead to a zero carbon requirement for new homes and schools in 2016, government estate in 2018 and non-residential building in 2019.

The London Plan sets requirements for developments to deliver energy efficiency improvements, efficient delivery of energy and the on-site generation of renewable energy. It places significant weight to the use of Combine Heat and Power systems and Decentralised Energy Networks in major developments. The Draft Replacement London Plan, published in October 2009, broadly keeps the same approach to reducing CO<sub>2</sub> emissions from new buildings but proposes to move away from mandatory reductions from on-site renewables to improvements over Building Regulations. This would give developers greater flexibility in meeting the targets as well as making it easier to check compliance.

Enfield's Proposed Submission Report for the Core Strategy has strategic objectives for mitigating the impacts of climate change and delivering sustainably constructed new homes. These policies are intended to provide the basis on which to set more specific policies within development plan documents and supplementary planning documents.

### **3. Existing Energy Demands and CO<sub>2</sub> Emissions**

The London Energy and CO<sub>2</sub> emissions inventory (2003) estimates the total CO<sub>2</sub> emissions from Enfield to be 1,328,568 tonnes per year, which equates to around 5 tonnes CO<sub>2</sub> per person per year. This is slightly lower than the London average and lower than the average in the UK. The biggest component is domestic energy consumption, which represents around 42% of all CO<sub>2</sub> emissions in the Borough. Given that the private housing stock represents 84% of all dwellings, this is potentially the single most important sector for addressing the energy consumption and CO<sub>2</sub> emissions. Data from the Energy Saving Trust (EST) estimates that between 37% and 54% of houses within each ward in Enfield can be classified as ‘under insulated’, having less than 100mm loft insulation and/or unfilled cavity walls.

As part of the study the existing energy demands from buildings have been calculated using benchmarks and modelling to map fossil fuel and electricity demand and CO<sub>2</sub> emissions (See Maps in Section 3 of the Technical Report). The highest heat demands are concentrated around areas of commercial and industrial activity and large public buildings, but when looking at density of heat demand, the highest concentrations correspond with areas of dense housing and high retail and industrial uses. High concentrations of electricity consumption were found to

correspond with areas of high commercial activity, particularly Enfield Town, Southbury, Palmers Green and Southgate.

#### **4. Future Development Plans**

New development in the Borough is to be concentrated in four key areas: North East Enfield, Central Leaside, Enfield Town and the area around the North Circular Road. Within each of these Strategic Growth Areas a Place Shaping Priority Area has been defined, these are Ponders End, Meridian Water, the area around Enfield Town Station and New Southgate respectively.

The Core Strategy proposes 13,480 new dwellings up to 2030, with the majority of these to be delivered within the four Place Shaping Priority Areas. New provisions of health facilities, schools and commercial development have also been identified and are also primarily planned within the Place Shaping Priority Areas.

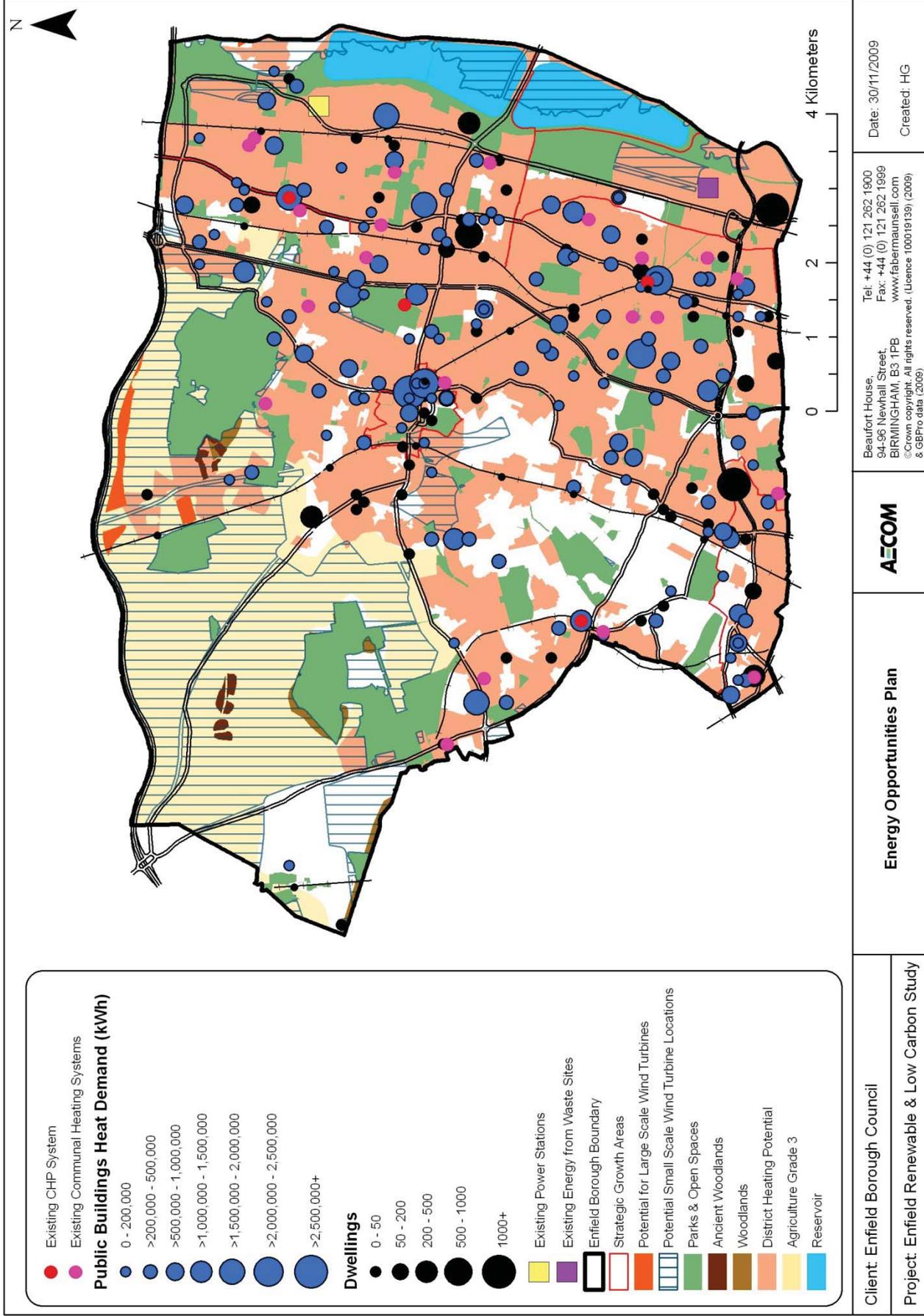
#### **5. Energy Opportunities and Constraints**

An energy opportunity plan has been produced as a planning resource which will allow assessment and prioritisation of delivery of opportunities.

The analysis has concluded that the scale of potential and types of technologies that are likely to be viable varies across the Borough. The southern and eastern areas of the Borough, which have a higher density of heat demand, present a significant opportunity to deliver district heating networks, both for the new and existing development. A few sites have been identified in the north and eastern edges of the Borough as being suitable for large scale wind turbines. The northern and western areas have opportunities to develop biomass resources.

Opportunities to utilise waste heat or energy from waste could be developed by working closely with EOn and the North London Waste Authority as well as the London Development Agency and other local authorities involved in the energy masterplan for the Upper Lee Valley Opportunity Area, together with planning policy to enable and encourage connection to adjacent development. There are also opportunities for sub-regional energy infrastructure as part of the wider Upper Lee Valley growth area, which is being taken forward by the LDA.

The four Strategic Growth Areas identified in the Core Policy have significant potential to deliver district heating schemes associated with strategic development sites. The North East Enfield and Central Leaside Strategic Growth Areas also have the potential to use wind resources. All opportunities are delivery dependant; the resource potential in itself does not contribute to targets. Further work will be required to explore feasibility and develop potential projects or strategies to take them forward.



Map 1: Energy Opportunities Plan (EOP) for Enfield

## 6. Opportunities for Applying Environmental Rating Systems

The 'Code for Sustainable Homes' (CfSH) is a rating system for new residential dwellings that assesses a number of different environmental impact and rates buildings on a scale of 1 to 6. The closest equivalent system for non-residential buildings is known as BREEAM (Building Research Establishment Environmental Assessment Method), which rates buildings on a scale from 'Poor' to 'Outstanding'. The study assesses the potential to apply these standards to all new developments in the Borough.

Work undertaken by Cyrill Sweett and AECOM on behalf of the Government has investigated the technical and financial implications of meeting the different levels of the CSH. Based on this work we have concluded that applying a requirement to achieve Levels 5 or 6 would result in significant increase in costs. Costs associated with the BREEAM assessment methodology are less well established, however the evidence suggests that achieving an Excellent (or higher) rating represents a significant increase in costs relative to a 'Very Good' (or lower rating).

The study concludes that applying CSH or BREEAM would help to deliver the objective of sustainably designed new buildings. However, going beyond CSH Level 4 and BREEAM Very Good however would require a more detailed assessment to test the financial and technical implications.

It is anticipated that BREEAM will be replaced by a 'Code for Sustainable Buildings' at some point in the future and proposed changes to the CSH methodology were published in December 2009 to reflect expected changes to the Building Regulations.

## 7. Policy Testing

### *Existing Development*

The impact of applying a consequential improvement policy for existing homes has been tested by reviewing the potential number of applications that would be affected. We then applied improvement measures based on a sample of existing homes in Enfield taken from EST's HEED database. Existing commercial properties were not tested since the Building Regulations has the scope to address these.

The study shows that there is a significant potential to deliver CO<sub>2</sub> savings for relatively little cost, depending on the measures required. The average estimated CO<sub>2</sub> saving per dwelling is 1.36 tonnes at an average cost of £900 for the proposed improvement measures (excluding external wall improvements). This could result in a cumulative reduction in CO<sub>2</sub> emissions of 1,000 tonnes a year.

Given the importance of addressing the existing private housing stock to deliver reduced energy consumption and CO<sub>2</sub> emissions (as detailed in section 3), the study concludes that this represents a significant opportunity for the Borough.

### *New Development*

The impact of the policy options for new development has been tested by considering how the energy strategies that may be proposed by typical developments are likely to demonstrate compliance with a selection of possible policies. The model developed for this study compares a range of technology options and selects the cheapest option which will comply with the target in question. The impact of each policy, in terms of technologies selected, CO<sub>2</sub> emissions saved and cost per unit of development, depends on which year a development comes forward for planning permission and which energy opportunities are available.

### New Residential Buildings

There is only a relatively small difference in the CO<sub>2</sub> savings associated with the base case policy of compliance with Building Regulations and the targets that go further, including more stringent policies of compliance with the current London Plan, particularly when put into context against the total emissions from the entire building stock within the Borough.

The proposed changes to Building Regulations, up to and including the introduction of the zero carbon requirement for homes and other buildings, is a significant driver and is likely to result in a significant increase in costs for developers.

The analysis indicated that the tested targets only result in a relatively small decrease in CO<sub>2</sub> emissions beyond what would be delivered by the Building Regulations and the additional costs are also relatively minor because of the limited time lapse before they are on a par with building regulations. However, the current and replacement London Plan policies would promote the use of district heating infrastructure sooner than Building Regulations. This would assist in the long term to address the existing building stock as well as providing a network for new buildings to connect to, which will be particularly important when the zero carbon requirements are in place.

For residential developments, there are feasible options for complying with all policies tested. Against Building Regulations, prior to 2016, residential dwellings were found to comply by using micro-generation systems (combining one or more of solar water heating, energy efficiency and photovoltaics (PV)). Against the replacement London Plan policy, decentralised energy systems using biomass or gas CHP were found to be the favoured options during the same period. This suggests that the higher targets could promote the use of district energy systems.

The use of biomass is favoured due to the relatively low costs compared to alternative options. However, the entire Borough has been declared an Air Quality Management Area (AQMA) and therefore the acceptable use of biomass will depend on the location of the development and the ability of the developer to demonstrate that the system will not adversely affect air quality.

The on-site carbon compliance element of the zero carbon requirement post-2016 is likely to be met by the use of highly energy efficient design and biomass or gas CHP systems in combination with one or more of biomass heating and PV.

Most of the major development sites will support the use of gas CHP, however the smaller sites (less than 100 dwellings) for which a CHP system is unlikely to be viable are likely to require biomass heating systems to comply with the higher CO<sub>2</sub> reduction targets as well as, where necessary, the ability to connect to a district heating system.

Our modelling indicates that where residential developments are able to connect to an existing district heating network, powered by waste heat from another source such as a large power station, this could deliver significant CO<sub>2</sub> emissions at a relatively low capital cost. This infrastructure may need to be provided by the Council, possibly in partnership (see section 9), the supplier of heat or a third party, but the developer could be asked for a contribution towards the costs. Although this represents a very cost effective solution, there are no networks currently in place in Enfield and the opportunity for connection to the EOn power station or the Edmonton Incinerator require a heat demand to be created to justify the infrastructure and plant requirements.

When appropriately installed and sited, small wind turbines (15kW) have the potential to deliver higher CO<sub>2</sub> savings than all other technological options selected, for a lower cost, although this option will only be feasible in limited locations due to spatial constraints.

Large residential developments in suitable locations may find that investment in a large wind turbine is a cheaper option for achieving the zero carbon requirement post 2016. However, due to the requirement for an 800m distance between turbines and the nearest residential property, few if any residential developments may be able to install one on-site and opportunities to install a turbine on adjacent land is also likely to be limited.

Financial viability of the solutions required to meet the policies tested will depend on a range of factors which are beyond the scope of this study to determine. These include land and market values of properties at the time of the planning application. The findings presented in this report should therefore be compared alongside the Affordable Economic Housing Viability Assessment and the Housing Market Assessment.

#### New Non-Residential Buildings

Our analysis indicates that some non-residential developments on a constrained site would struggle to achieve the zero carbon requirement from 2019 onwards, based on the current definition of zero carbon for dwellings. However, our model is based on flat rate CO<sub>2</sub> emissions, whereas the proposals for Building Regulations and the new London Plan is to adopt an aggregate approach for non-residential buildings, where some building types have higher requirements than others in order to deliver the targeted saving across all building types.

Because this is still out for consultation and the details have not yet been defined, we have not been able to model this at this point in time.

The technologies that might be proposed on energy constrained sites are similar for all types of non-residential development considered in this analysis. Because the scale of development and the relative heat and electricity demand differs for an office compared to a workshop or storage facility, the percentage CO<sub>2</sub> savings that these technologies could deliver varies.

Subject to air quality constraints, biomass heating is likely to be the preferred option for complying with all proposed targets, as the capital cost is relatively low and it is able to deliver a high contribution to CO<sub>2</sub> savings. A combination of advanced energy efficiency and PV could achieve similar CO<sub>2</sub> emissions reductions, but is significantly more expensive. Connection to an existing district heating network would offer the cheapest route to compliance but, as previously discussed, this option is not currently available.

For smaller non-residential developments, small wind turbines have the potential to deliver high CO<sub>2</sub> savings, although they will only be feasible in limited locations due to constraints and spatial requirements. Larger developments, particularly in North East Enfield or Central Leaside, may be able to accommodate large scale wind turbines, which would aid compliance especially for the more stringent policy requirements post 2019.

Further details of the policy testing, including some site based case studies, can be found in Section 7 of the Technical Report.

## 8. Policy Recommendations

Based on the assessment of energy opportunities and constraints in the Borough and the results of the policy testing, the study has proposed a number of policies that could be applied by the Council. These policies are outlined below along with a summary of the justification; further detail is contained within Section 8 of the Technical Report.

*Proposed Policy 1: Support for decentralised low and zero carbon technologies in line with the energy opportunity plan*

Enfield Borough Council are seeking to reduce CO<sub>2</sub> emissions and increase the supply of decentralised renewable and low carbon energy with the Borough. Applications for all types of decentralised renewable and low carbon energy will be considered favourably by the Council. The Energy Opportunities Plan shows the potential application of different technology solutions. Planning applications for new development will need to demonstrate how they contribute to delivery of the current Energy Opportunities Plan.

The Council recognises that different energy technologies and CO<sub>2</sub> reduction strategies will suit different parts of the district and different types of development. To reflect this three 'energy opportunity areas' have been defined.

- District Heating
- Wind
- Energy Constrained

Where possible, the Council will work with developers to help deliver energy opportunities beyond the development boundary.

#### *Policy Justification*

It is proposed that the Energy Opportunities Plan act as the key spatial plan for energy projects in Enfield, underpinning the policies related to the delivery of energy efficiency and renewable and low carbon energy generation as well as prioritising the infrastructure on which money should be spent. It should be used to inform corporate strategies and investment decisions taken by the local authority and local strategic partnership (see Section 9 and Appendix 3) and should be readily updated to reflect new opportunities and changes in feasibility and viability.

The policy recognises that different areas and development types will have different opportunities for achieving CO<sub>2</sub> reductions. For example, developments in energy constrained areas will have fewer opportunities for delivering CO<sub>2</sub> reductions cost effectively than those in areas with distinct energy opportunities such as district heating or wind. Similarly, small developments are likely to have fewer opportunities.

The energy opportunity area approach is designed to help applicants determine which technologies are likely to be most suited to a given area. However, to reflect the fact that regulation may change and the applicability of new and existing technologies may vary over time, the Council will be prepared to discuss proposals that deviate from the Energy Opportunities Plan and Energy Opportunity Areas with applicants at the pre-application stage.

#### *Proposed Policy 2: Reduction in emissions from new development*

In order to minimise the impact of new development in the Borough, all new development will be expected to use energy efficiently and to incorporate decentralised renewable and low carbon technologies to deliver CO<sub>2</sub> reductions above the level required by Building Regulations current at the time of development. Developers should explore innovative ways of funding these measures, including support from third parties and the community and/or a financial payment into a Carbon Fund, which will be used by the Council to deliver projects identified in the Energy Opportunities Plan.

All developments will be expected to achieve improvements beyond Building Regulations in line with the London Plan. Where this is not feasible developments will be required to contribute to a buyout fund for the CO<sub>2</sub> emissions that cannot be offset on site.

The London Plan requires all new buildings, both residential and non-residential, to achieve an additional reduction on the residual CO<sub>2</sub> emissions after Building Regulations compliance. This can be achieved through a combination of energy efficiency measures, on-site renewable and low carbon energy technologies and directly connected heat or power (not necessarily on-site).

The policy testing has demonstrated that the proposed London Plan policy will deliver higher CO<sub>2</sub> savings and provides a greater incentive for developers to install on-site district heating infrastructure than relying on Building Regulations alone or small improvements upon it. It is more flexible than the previous London Plan policy which restricted developers to using renewable energy.

However, to reflect the fact that some developments may be more constrained and the targets may not be achievable on all sites, developers would have the opportunity to pay into a fund, with contributions dependent on a levy or tariff that could be linked to the CO<sub>2</sub> emitted per square metre of floor area over the building lifetime of 30 years. Three possible fund options exist: Section 106; the Community Infrastructure Levy; or allowable solutions. Further work will be needed once the Government confirms details of how each of these will work.

### *Proposed Policy 3: District Heating Opportunity Areas*

Enfield Council supports the development of district heating networks within the Borough and recognises the important role that new development can play in delivering these systems and developing capacity.

The Council will expect all large residential and mixed use developments to consider installing CHP and a site wide energy network. This will be the preferred solution for the delivery of heat unless it can be shown that such a system would not be viable. To improve viability and feasibility, applicants should engage with the Council, third parties and communities. The design and layout of site-wide networks should consider the future potential for expansion into surrounding communities. They should provide capped off connections which can be used to connect to networks beyond the site boundary in future. Where appropriate, applicants may be required to provide land, buildings and/or equipment for an energy centre to serve existing or new development.

The Energy Opportunity Plan shows the areas in which district heating and CHP is deemed to be viable on the basis of heat density. Additional information such as the London Heat Map and the location and heat demands of potential anchor loads can provide additional information to support an assessment of an area's viability. Development within these areas will be deemed to have the potential for future heat network connection and as a result will be required to be compatible with a future heating network.

### *Policy Justification*

The government and the GLA have recognised the importance of district energy networks and CHP systems in order to reduce CO<sub>2</sub> emissions, especially in dense urban areas. The Energy

Opportunities Plan has shown that there is a significant opportunity in the Borough. Developments within district heating opportunity areas will need to carry out an assessment of the potential to deliver a district heating network. Developers can meet the requirements by installing a site-wide network, connecting to an off-site network or, where these are not possible, enabling the development to connect in the future.

The policy requires larger more strategic new developments to install their own network, which can later be connected up to a larger network. This has the benefit of reducing CO<sub>2</sub> emissions in new development and contributing to the longer term objective of addressing emissions from the existing building stock. A specific set of criteria will be used to define the district heating priority areas. (See section 8.4.2 of the Technical Report for more details)

*Proposed Policy or Guidance 4: Consequential improvements to existing residential properties*

This policy could be included as part of a suitable development plan document or the Development Management Plan. Elements of it might also be suited to an SPD.

The Council recognises the importance of improving the energy performance of the existing building stock and strongly encourages the uptake of energy efficiency and renewable and low carbon technologies as part of building refurbishments.

Planning applications for changes to existing domestic dwellings will need to be accompanied by a completed 'energy checklist' to identify if there are any reasonable improvements that could be made to the energy performance of the existing dwelling. If measures are identified applicants will be encouraged to undertake these.

Improvements will include, but not be restricted to: loft and cavity wall insulation, draught-proofing, improved heating controls and replacement boilers. The measures will be required to provide a reasonable rate of return on the investment through reduced utility bills and the total cost should be no more than 10% of the total build cost.

*Policy Justification*

The purpose of the policy is to reduce CO<sub>2</sub> emissions from existing buildings. Since consequential improvements for non-domestic buildings are covered by Building Regulations this policy focuses solely on housing.

The policy applies to all householder applications for planning permission to extend or materially alter a home. The approach aims to make the most of any straightforward opportunities for improvement to the property. This includes loft and cavity wall insulation, draught-proofing, improved heating controls and replacement boilers.

The checklist approach is simple – if any of the measures on the list are applicable, pay for themselves in energy cost savings in less than seven years and their combined cost does not exceed 10% of the cost of the building works, they are required. If none of the measures on the list fit the bill, none are required. Measures discussed in Chapter 9 should be considered in terms of their effectiveness in helping to reduce the capital costs to residents.

Our initial assessment suggests that, based on the assumptions we have used for the rate of applications received and the scope for the efficiency measures proposed, up to 1,000 tonnes CO<sub>2</sub> could potentially be saved each year.

#### Proposed Policy 5: Wind power

The Council recognises that wind power can play an important role in reducing CO<sub>2</sub> emissions and will positively consider applications for wind turbines which are, in the view of the Council, designed and located appropriately.

Three principal opportunities for the use of wind power have been identified:

- Large scale wind turbines delivered by commercial developers;
- Small or large scale wind turbines delivered by community groups, co-operatives and individuals;
- Small or large scale wind systems delivered alongside new developments.

#### *Policy Justification*

The government's Renewable Energy Strategy expects a significant proportion of renewable electricity to be delivered from onshore wind. If the stringent targets are to be achieved then all available opportunities will need to be taken.

Wind is one of the most cost effective renewable energy technologies but this is highly dependent on the size of the turbine. Despite there being good wind speeds across all parts of the Borough it is recognised that commercial opportunities for turbines are likely to be limited by the constraints highlighted in the Technical Report. However, opportunities for individual large or smaller turbines exist across the Borough and, where these meet set criteria (see Section 8.6.2 of the Technical Report) they will be encouraged.

Developers within wind opportunity areas will be expected to show that they have fully considered the potential to deliver a reduction in the development's CO<sub>2</sub> emissions beyond Building Regulations requirements using a wind turbine or turbines on-site. Where no opportunities exist on-site applicants should demonstrate that they have considered off-site opportunities. Close engagement with the Council and communities will be essential and different ownership models should be considered as a way of gaining support.

#### Proposed Policy 6: Environmental design standards

All developments should be designed to reduce their impact on the environment and improve wellbeing of occupants. Where appropriate, all development will be required to demonstrate that these issues have been considered by undertaking a BREEAM or Code for Sustainable Homes assessment (using the most up to date assessment methodology available).

In line with Core Policy 4, all new housing development should seek to exceed Code for Sustainable Homes Level 3. All new non-domestic developments will also be required to achieved BREEAM Very Good or higher (or equivalent rating of an alternative or updated scheme). Developments in areas with more opportunities or with a strategic importance for delivering buildings with improved environmental standards may be required to meet higher targets.

#### *Policy Justification*

The application of BREEAM and the CSH can help to deliver development that reduces its impact on the environment. The cost implications of achieving CSH Level 3 and BREEAM Very Good are relatively small since the most significant costs are normally in the achievement of credits in the energy section. The mandatory energy standard for CSH Level 3 will be required through Building Regulations. In many cases, developments meeting Proposed Policy 2 would already be doing enough to meet the mandatory energy standard for CSH Level 4. BREEAM does not have any mandatory standards but, in complying with the policies outlined above, developments would achieve a significant number of credits to contribute towards the overall score.

There is a degree of flexibility in the other credits in both schemes and, although this study has not investigated all the possible constraints in detail, it is assumed that CSH Level 3 and BREEAM Very Good should be able to be achieved for new development on all sites in the Borough.

Development in the strategic growth areas could be required to meet higher standards, such as CSH Level 4 and BREEAM Excellent. All residential development in these areas is likely to include district heating systems and be meeting the requirements of Policy 2, and therefore the additional technical design and cost implications of moving from Level 3 to 4 would be minimal. However, specifying CSH Levels 5 or 6 (as they are currently defined) would be significantly more expensive and technically challenging and would require a site-based assessment to be undertaken. There is also a significant difference between BREEAM Very Good and Excellent and therefore setting this standard would need to be assessed before it is applied.

## **9. Delivery & Funding**

There are a wide range of delivery mechanisms that can be employed to support planning for energy. Not all will be suitable for Enfield and mix will be needed to encompass all of the energy opportunities. This report provides the context for making those decisions. Further work, discussions and advice will be needed to make them happen. As a first step we recommend that Enfield Council explores further the potential for using Carbon Trust Low Carbon Building Strategic Design Advice money to undertake the following next steps:

*Provide the necessary leadership and skills*

- The Council must take strategic leadership role together with Enfield Strategic Partnership to ensure the necessary political and stakeholder buy-in. This will involve using this study inform preparation of relevant strategies, including the climate change strategy and North London Waste Plan. A stakeholder workshop and presentations to the Climate Change Board were undertaken as part of this study.
- It must develop skills across the Council and its partners.

*Priority actions and projects*

- The Council needs to set out a clear framework which gives relative certainty. Action should be prioritised at strategic locations, council and public sector property and assets, such as Meridian Water, New Southgate, Ponders End and Enfield Town.
- Initiatives to support the proposed residential energy efficiency retrofit policy should be designed to reduce the financial burden on households.
- The Council should work with eligible partners to develop a micro-generation retrofit strategy based on the opportunities presented by the Low Carbon Building Programme.
- A set of priority district heating and waste heat schemes should be drawn up by the Council and its partners and further feasibility work carried out. This should be based on factors such as financing options, planning, liaison with stakeholders including the LDA, phasing and type of development. Initial feasibility work could be funded by Strategic Design Advice or European Local Energy Assistance (ELENA) , with later project finance options including the issuing of bonds to residents and businesses or the new London Green Fund. Options for designation as a district heating priority area include:
  - Opportunities for incremental delivery, such as by requiring energy infrastructure to be installed as part of area improvements, such as the North Circular housing improvements and new development.
  - Proposed improvements to the public realm as part of the Ponders End Central development area and Middlesex University and High Street developments should be seen as a key opportunity for installing a district heating network.
  - Priority should be given to assessing the feasibility of installing a district heating network as part of improving accessibility in Central Leaside and North East Enfield
  - The area around Enfield Town Station Priority Area offers the chance to plan a network that links new development with the Civic Centre and retail along the high street.
  - Sites that include new buildings with significant heat demands (anchor loads) or energy centres as part of the development will make ideal district heating candidates.

- Opportunities for utilising waste heat from the power station should be maximised by undertaking a feasibility study. This should consider: opportunities to connect public sector anchor loads, new development and the very high private heat loads that exist nearby.
  - Opportunities for utilising waste heat from the Edmonton incinerator are limited at present, but in the future could supply new development at Meridian Water.
  - Areas of hard to treat homes and buildings, such as those with solid walls or conservation areas.
- Should the Council agree to lead installation of a district heating network then it is recommended that they explore the option of establishing a Local Development Order in order to add certainty to the development process and potentially speed up delivery.
- The London Development Agency (LDA) is currently assessing the feasibility of an energy masterplan for the Upper Lea Valley area to inform the Opportunity Area Planning Framework (OAPF) currently being prepared by the Greater London Authority (GLA). Enfield and its partners should involve the appropriate people from the LDA in further work, especially on the North East Enfield and Central Leaside strategic growth areas.
- Beyond the large scale wind opportunity areas identified in the energy opportunities plan opportunities should be explored for isolated turbines in the commercial areas to the south of Enfield power station or near to Edmonton incinerator. The Council and its partners should identify delivery opportunities, considering available financial mechanisms, publicly owned land and community involvement and ownership.
- Opportunities for biomass, biofuels and biogas should be explored with partners in neighbouring authorities and the wider regions.
- The Council and its partners should undertake further work to explore the role for the local authority to link housing development to energy supply delivery.

#### *Delivery vehicles and funding*

- The Council and its partners need to establish an appropriate form of delivery vehicle or vehicles to pursue the key energy efficiency and supply opportunities. Further work will be needed to understand what is suitable for Enfield but will need to consider the potential for establishing an Energy Service Company (ESCo), partnerships and joint ventures.
- Funding mechanisms should be identified and applied first to priority schemes, co-ordinated through the appropriate delivery vehicle. These could include:
  - Delivery of whole house and street-by-street energy efficiency improvements and retrofit of micro-generation technologies.

- Setting up a carbon fund, possibly using the Community Infrastructure Levy (CIL). This should be used to pay for projects identified in the energy opportunities plan, including large or small wind turbines off-site in the wind opportunity areas. Further work will need to be undertaken to establish the extent of the opportunities.
- Developing a plan to deliver allowable solutions to ensure funding from new development is directed towards the best solutions in a coordinated way.

Communities are likely to play a crucial role in the delivery of energy infrastructure. However, to be successful further work will be needed to explore how communities function within Enfield.

#### *Potential Projects*

The report proposes a number of projects that could be taken forward in the short, medium and long term

##### *Short Term (next 1 – 3 years)*

- *Ponders End District Energy Feasibility Study*
- *Meridian Water Energy Infrastructure Strategy*
- *Scoping of potential delivery vehicles, powers and funding*

##### *Medium Term (next 3 - 10 years)*

- *Energy Infrastructure Strategies for other Place Shaping Priority Areas*
- *Implementation of energy infrastructure at Ponders End*
- *Engage with EOn and NLWA and other stakeholders*
- *Agree approach to delivery and funding of infrastructure schemes*

##### *Long Term (10+ years)*

- *Establishment of Borough-wide Energy Infrastructure and connections to the Wider Upper Lee Valley*

## **10. Monitoring and Enforcement**

The study proposes the following potential options for monitoring the uptake of low and zero carbon technologies across the Borough:

- The creation of a database to capture the details of low and zero carbon technologies implemented in the Borough, including:
  - Location and details of district and communal heating schemes;
  - Location and system specification of micro-generation systems; and
  - Location and specification of community scale systems such as large-scale wind turbines.

This database could then be used to report against London-wide and national targets for renewable energy generation.

- Regular updates of the Energy Opportunities Plan and the wider set of opportunity and constraints maps to take account of new development and other changes that might affect the information presented. The updated maps would also be able to represent the details included in the database described above.
- Using the model created for this study the Council could undertake an ongoing monitoring programme of CO<sub>2</sub> emissions from buildings within the Borough.
  - Update the survey data for existing residential and commercial development;
  - Updating the projected new development;
  - Including improvement measures to existing dwellings; and
  - Including new development and associated renewable and low carbon solutions as they are implemented.