

10 Delivering Renewable & Low Carbon Energy in Hertfordshire

10.1 Introduction

Along with planning policy, targets provide a useful mechanism for articulating to stakeholders the extent of the challenge around achieving maximum carbon savings through low carbon and renewable energy solutions. They also enable us to assess progress and, if necessary, to revise targets in order to meet agreed objectives. However, to be effective, policies and targets need to have a strategy for delivery. This strategy will need to address:

- What the objectives of the policy or targets are
- What is the appropriate mechanism for delivery
- Who is responsible for their delivery
- An action plan

This chapter describes some of the mechanisms available to Hertfordshire to deliver the principal opportunities for decentralised renewable and low carbon energy opportunities identified in the Energy Opportunities Plan. It is not intended to be an exhaustive list, nor does it reach definitive conclusions about which mechanisms are most suited to the Hertfordshire LPAs. Rather it seeks to clarify the importance of considering delivery at the same time as planning policy and provide guidance on what opportunities exist and where further work is required. Making clear recommendations on what approach will be suitable for Hertfordshire will require a more detailed study involving discussions across the LPAs and with partners.

Using the Energy Opportunities Plan this chapter considers delivery mechanisms across three character areas:

- Energy constrained areas
- District Heating opportunity areas
- Wind opportunity areas

It addresses both new and existing development, and different scales of development.

10.2 Character Area 1: Energy Constrained

10.2.1 Existing development

The CO₂ savings that can be achieved through improvements to existing buildings are substantial and this should be a priority across all areas. In addition to energy efficiency measures, there is potential to retrofit low carbon and renewable energy microgeneration technologies within existing development. This cannot easily be required by planning, but can be encouraged by the Council, which can seek to engage communities and highlight the benefits of microgeneration, especially with the introduction of the Feed-in-Tariff for electricity and the Renewable Heat Incentive for heat. (Appendix D)

There are funding sources already available to homeowners and businesses to assist with the capital cost of installing CO₂ reduction solutions. These include Warm Front, Carbon Emissions Reduction Target (CERT), the Big Lottery Fund Community Sustainable Energy Programme (CSEP) and the Energy Saving Trust Low Carbon Communities Challenge. Further details are contained in Appendix D.

Most funding for improving the energy performance of the existing stock, including Community Energy Saving Programme and CERT, are coordinated through utility companies. The government's recently published Household Energy Management Strategy suggests that more co-ordinated approach to the street or neighbourhood level will be necessary to deliver the level improvements necessary to meet the demanding CO₂ emission reduction targets required through the Climate Change Act. It is expected that local authorities will assume this responsibility.

In the meantime, local authorities have the powers to deliver energy opportunities in the existing stock using the Wellbeing Power. There are examples of the use of this power for this purpose by local authorities around the country: South Hams Council used the power as the basis of a District/County agreement to establish a waste transfer station; Nottinghamshire County Council use it to set up a non-profit wood fuel distribution company limited by guarantee; and Torbay Council used it to set up a public-private partnership regeneration company.

Other potential mechanisms that could be used individually or as a package by Hertfordshire's LPAs to stimulate the uptake of energy efficiency measures and microgeneration technologies are described below. Responsibility for delivery and management of these mechanisms could be assumed by each Council itself. Alternatively, it is possible to enter into a partnership with a third-party provider or to set up a special purpose vehicle.

- *Discount provision* – available finance could be used by the Council to bulk buy technologies, enabling them be sold on at a discount to households and businesses.
- *Householder or business hire purchase* – Local authorities could establish an initiative to lease appropriate technologies to householders and businesses. For microgeneration, rental costs could be charged as a proportion of the feed-in-tariff received by the beneficiary. After a period of time, ownership of the technology would transfer to the householder or business.
- *Householder or business rental* – a third model could be for each Council, consortium of councils, or another delivery vehicle of choice, to retain ownership of the technologies and to rent roof or other suitable space from homeowners, businesses and other organisations. Again, rental costs would be set as a proportion of income from the feed-in-tariff. As with the hire purchase option, this approach would give benefits of low carbon and renewable energy to communities without the up-front expense. The advantage of this option would be the retention of control over phasing and technology choice, and greater flexibility to respond to changes in technology and demand.

Delivery options for CO ₂ reductions in existing development	
CO ₂ reduction measures	Delivery option
Increased energy efficiency	Provision of discounted CO ₂ reduction solutions
	Hire purchase of CO ₂ reduction solutions
	Rental of space for CO ₂ reduction solutions
Increased microgeneration	Awareness and education campaign for householders and businesses.
	Salix Finance
	Warm Front
	Carbon Emissions Reduction Target
	Big Lottery Fund Community Sustainable Energy Programme (CSEP)
	Energy Saving Trust Low Carbon Communities Challenge

Table 10.1: Delivery options for existing development. Details of schemes mentioned above are provided in Appendix D.

10.2.2 New development

Building Regulations are the primary drivers for higher energy performance standards and renewable and low carbon energy generation in new developments. The role of the Hertfordshire LPAs is therefore limited beyond specifying more stringent planning policies to achieve this.

Another option is to apply conditions to sales of local authority owned land, whereby a lower than market value sale price is agreed with the developer in return for a commitment to meet higher specified sustainability standards. Rules governing this are contained within the Treasury Green Book which governs disposal of assets and in within the Best Value - General Disposal Consent 2003 'for less than best consideration' without consent. It is our understanding that undervalues currently have a cap of £2 million without requiring consent from Secretary of State.

10.3 Character Area 2: District Heating Opportunity Areas

Large area wide district heat and power schemes in both new and existing development may be sufficiently large to contribute to local authority, regional or national energy generation targets rather than primarily mitigating increases in CO₂ emissions resulting from new development. The government proposals for allowable solutions post 2016 will place emphasis on local authorities to identify and support delivery of community scale solutions, and developing district

heating networks in suitable areas is potentially one of the key solutions for which this investment could be used.

Table 10.2 illustrates the potential value of allowable solutions investment based on a value of £100 per tonne CO₂ over a 30 year lifetime for a number of different development sizes under Code level 5 and level 6. This assumes that all CO₂ reductions above carbon compliance are met through allowable solutions off-site.

Number of dwellings	Code level 5 (30% CO ₂ reduction through allowable solutions)	Code level 6 (80% CO ₂ reduction through allowable solutions)
	Potential allowable solutions contribution £	Potential allowable solutions contribution £
10	£4,800	£12,800
50	£24,000	£64,000
200	£96,000	£256,000
1000	£480,000	£1,280,000
5000	£2,400,000	£6,400,000

Table 10.2: Potential local investment from allowable solutions funding for different scale developments.

To maximise the benefit of community heating schemes, the scale of the system needs to be maximised, therefore requiring the involvement of potentially many bodies and structures across both the new build and existing sectors. The drivers for district heating networks in the new and existing sectors are different, with regulation and planning acting on the new sector, and markets acting on the existing sector, and it is the role of the local authority to strategically drive forwards the delivery of schemes by providing the necessary support and coordination to the relevant parties.

De-risking of district heating schemes is a key requirement for attracting interest in developing schemes. There are a number of ways in which the public sector can assist with this process:

- Providing initial input into the assessment of potential schemes and developing strategies for the delivery of schemes.
- Providing support through planning to mandate the connection of new developments and for planning applications associated with the development of the scheme infrastructure (for example, energy centres, and road works).
- Providing material support in terms or the provision of land.
- Providing long term contractual support through signing long term energy purchase contracts with the scheme provider.
- Providing finance into the scheme in the form of low cost loans or subsidises, potentially from allowable solutions money.

- Providing coordination and marketing support, by promoting the scheme to other local public and private organisations to encourage connection uptake.

There are a number of ways in which the public sector can provide this support. One extreme is that the scheme is entirely developed by a third party developer of Energy Services Company (ESCo), and the public sector provides support to this commercial organisation. The other extreme is that the public sector (most likely the local authority) becomes the ESCo itself, and develops and operates the scheme, selling heat and power. A more commonly discussed option is where the local authority forms a partner in a joint venture for developing schemes, becoming a partner in an arm's length company which owns and operates the schemes. The advantages of this are that the local authority maintains a degree of ownership and control over the scheme, and private sector finance and expertise can be levered. One example of this is the Aberdeen CHP scheme which was set up initially to deliver heat and power to high rise block of flats containing a mix of social and private housing⁵². The role of an ESCo is discussed further under Section 10.5.

10.3.1 Existing development

Proposed delivery mechanisms for existing development in this character area will be the same as the Character Area 1.

10.3.2 New development

Some of the options for delivering the energy opportunities plan are described in the following sections and listed in Table 10.3, with more detail provided in Appendix D.

Delivery options for CO ₂ reductions in new development	
CO ₂ reduction measures	Delivery option
Lower CO ₂ emissions standards	Conditions attached to local authority owned land sales
	Policy requiring high sustainability standards
Higher sustainability standards	Policy requiring connection to district heating networks
	Policy requiring lower CO ₂ emissions

Table 10.3: Delivery options for new development

Many of the options for funding offer relatively small amounts of money which are unlikely to make significant inroads into delivery of the Energy Opportunities Plan. One possible solution, which is both a planning and a delivery mechanism,

⁵² More information on this and other ESCo schemes can be found in "Making ESCos work" – London Energy Partnership 2007.

is to prioritise delivery of energy opportunities through spending of money raised through a Carbon Buyout Fund. It is likely that such a fund will be operated through the Community Infrastructure Levy (CIL), which unlike Section 106 contributions can be used 'to support the development of an area' rather than to support the specific development for which planning permission is being sought. Therefore, contributions collected from development in one part of the charging authority can be spent anywhere in the borough. It is our understanding that CIL money can be spent on infrastructure projects (the definition of infrastructure includes renewable and low carbon energy technologies) delivered by the public or private sectors or partnership between the two. This flexibility will enable a Council, as a 'charging' authority, to fund energy infrastructure identified in the energy opportunities plan.

To progress this opportunity Hertfordshire LPAs would need to:

- Develop a charging schedule that is subject to the same level of scrutiny as a development plan document.
- Set out the proposed amount to be levied, expressed as a cost per meter squared.
- Consider the impact of a levy on scheme viability.

10.3.3 Establishing a biomass supply chain

This study has identified biomass as a good potential resource for delivering CO₂ reductions in the County. Similar studies for neighbouring counties are likely to reach the same conclusions and since the available resource is finite and relatively limited, it is useful to take a County or even region-wide approach to sourcing and supply to ensure that sufficient biomass is available, but also that its use is managed and sustainable. There is a potential role for the local authorities or County to help develop a biomass supply chain, to coordinate the collection and growth of biomass across the County. A structured approach along these lines will help de-risk the uncertainties about biomass supply to energy scheme developers, so that guaranteed and regular biomass supplies are available. Developing the supply chain will require the coordination of a number of bodies including forestry companies, private land owners, and waste management companies.

A greater use of biomass as a fuel raises some concerns which need addressing. Biomass is generally transported by truck and therefore transport CO₂ emissions should be taken into account. There is conflicting evidence as to the environmental impact of transporting biomass against the CO₂ saved when used as a fuel. A recent report by the Environment Agency provides data which suggests an increase in CO₂ emissions of between 5% (wood chip) and 18% (wood pellets) for European imports, but the data is not clear for transport within the UK. As there is a good potential biomass resource in the County and therefore supply would be local, transport-related emissions may not be a concern in Hertfordshire. (Note –the CO₂ emissions factors used for biomass in Building Regulations include an allowance for transportation. This is clearly an average value and the actual value will depend on the supply chain used).

10.4 Character Area 3: Wind Opportunity Areas

There is considerable controversy over the development of large scale wind in the rural areas of Hertfordshire, as highlighted in the recent plans for a small scale wind farm of three turbines at Benington. Whilst the overall potential for Hertfordshire is relatively limited, the energy opportunities mapping in this report identifies a still significant potential for large scale wind which should be exploited. Objections around wind farm development tend to be based on poor science and misleading information which in many cases has no scientific basis and is not borne out by existing installations. In addition the fact that most applications are from large profit making commercial organisations does not tie in well with local communities since they are unlikely to see any of the benefits.

The local authorities therefore have a key role in encouraging the uptake of wind turbines in Hertfordshire, and potential delivery mechanisms include:

- Supporting communities to develop community owned project of a small number of turbines. There is anecdotal evidence from across Europe that community ownership of wind turbines, where a profit share is retained by the local residents can increase the acceptance of wind turbines. Income is generated by electricity revenue and incentives such as ROCs. There is a potential role for local authorities to become a partner in delivering community wind project, thus providing support financing and planning.
- Education. The role of education in delivering low carbon energy schemes was seen as key in the workshops for this study, and the local authorities and education authority should coordinate activities in this areas. A range of education measures can be used to educate communities and school children to ensure to ensure than people have the real facts about wind and are not swayed misinformation.

In new developments based in areas identified as having potential for wind generation, the local authorities should support applications which make use of wind on or near these sites. In general, large scale turbines are far more effective and their installation should be encouraged over smaller scale systems which may provide negligible benefits. In new development, the potential for community ownership remains important (and may be encouraged through allowable solutions where shares in off-site turbines are provided to house owners to provide a real "link" between the turbines and development). In addition the role of education remains important for both the new development residents and surrounding areas.

Two examples of successful community wind projects are provided opposite:

Community owned wind farms – case study

Westmill Wind Farm, Oxfordshire

www.westmill.coop



Westmill is the first wind farm in the South East of England and the first 100% community owned scheme in the UK from commissioning. The scheme produces pollution-free electricity for over 2,500 average homes.

The wind farm has five towers erected in a straight line across an old airfield, near Watchfield, South Oxfordshire. The electricity generated is conveyed by an underground cable to a sub-station, where it is metered and fed into the local grid. Crop farming may continue as before with planting taking place right up to the base of the towers.

The turbines are run by Westmill Wind Farm Co-operative Ltd, an Industrial & Provident Society based on the highly successful wind farm run in Cumbria by Baywind Energy Co-operative Ltd. Westmill Co-op has 2,374 members. The co-op financed the purchase and construction of the five wind turbines through a 4.6m fundraising campaign that saw the public able to buy shares in the project and was supplemented by a bank loan.

The share launch and project development was managed by Energy4All established to provide support to co-operative wind farm projects around the UK. The land owner is Adam Twine, an organic farmer with an interest in community and environmental issues, who secured the required planning consents.

Westmill has been established to provide an opportunity for all who are concerned with the effects of climate change to become involved in the ownership and operation of a wind farm. It was especially, but not exclusively, aimed at groups and individuals local to the Wind Farm.

This is the first project of its kind in Southern England and its importance has been recognised by the award of a capital grant from South East England Development Agency (SEEDA).

Small scale wind turbine – case study

Beaumont Primary School, Suffolk



Beaumont Community Primary School opened in September 2003, located on a hill to the Western edge of Hadleigh in Suffolk. The single storey, cedar clad building has accommodation for 140 pupils.

The School installed a 6 kW Proven wind turbine that generates enough electricity to run all the computers in the IT suite. The turbine was partly funded by the government's Clear Skies initiative and SCC. A further 1kW is produced by a number of photovoltaic panels mounted on the roof, also part-funded by a grant from the DTI.

A computer in the school's reception area can tell pupils how much electricity is being generated at any particular moment.

"The children have quickly taken on board the whole concept of renewable energy," said the head teacher, Stella Burton. "We are sure that they will use the knowledge and understanding that they have gained to improve their future lives and the lives of those around them."

When more electricity is generated than the school needs, the surplus is sold back to the national grid.

Ref: Jessica Aldred

<http://education.guardian.co.uk/pictures/0,8552,1595002,00.html>

10.5 Delivery Partners

It is clear that a planned approach is necessary, with targets complemented by spatial and infrastructure planning. The implications of this for councils are significant. We are no longer simply talking about a set of planning policies; rather success depends on coordination between planners, other local authority departments (including the corporate level) and local strategic partners.

A coordinated relationship between planning, politicians, the local strategic partnership (LSP) and other local authority departments, including legal, finance, and environment and housing, will be crucial. To be effective, leadership will be needed by the LSP, the environment sub group and elected members to provide strategic direction for energy policy and delivery of the Energy Opportunities Plan. Opportunities for a County-wide partnership should also be explored.

The two central documents for coordinating delivery of low carbon and renewable energy projects at the local level are the local authority Community Strategies and Local Development Frameworks (LDF) prepared by the planners. The Community Strategy must make sufficient mention of energy and climate change and provide clarity on commitments or targets. Both documents need to set out a clear delivery plan for policies and targets.

Consideration will need to be given to the extent of private sector or community involvement. Where market delivery is not forthcoming, councils can lead delivery of energy infrastructure, potentially with support from the private sector, investors or even communities. Communities may also want to join together to deliver energy infrastructure, investing and in capital cost and receiving income from selling energy.

Delivery options for district heating and wind solutions	
CO ₂ reduction measure	Delivery Option
Wind energy	Local authority-led delivery vehicle partnership established through Powers of Wellbeing Privately owned ESCo Merchant wind (e.g. Partnerships for Renewables, EDF) Local Development Orders Cooperatives CIL Allowable solutions
District Heating with CHP	Local authority-led delivery vehicle partnership established through Powers of Wellbeing Privately owned ESCo Local Development Orders Carbon Trust Investments Carbon Emissions Reduction Target CIL Cooperatives Allowable solutions
Biomass energy	LA-led delivery vehicle or partnership established through Powers of Wellbeing Privately owned ESCo District wide development and coordination of biomass supply chains Single Farm Payment DEFRA Grant Rural Development Programme Allowable solutions Cooperatives Renewable Energy Fund Carbon Emissions Reduction Target EST Low Carbon Communities Challenge

Table 10.4: Delivery options for community-wide CO₂ reduction solutions. Details of the schemes mentioned above are provided in Appendix D

When exploring options for setting up a local authority or County-wide delivery vehicle or partnership it is likely that skills will need to be developed to make this approach successful. This does not need to be an insurmountable barrier and there are a growing number of local authorities engaging in similar activities both in energy and other areas. They key to success is likely to be leadership: leadership from senior local authority management or, at least initially, from committed individuals in planning or other departments.

ESCo models range from fully public, through partnerships between public, private and community sectors to fully private. Broadly speaking, the greater the involvement of third parties the lower the risk to the authority but, importantly also, the less control the authority will have over the company. Whichever route is chosen, it is recommended that the ESCo should be created or involved as early on in the development process as possible, so that its technical and financial requirements can be fed through into negotiations with potential customers.

	Private Sector Led ESCo	Public Sector Led ESCo
Advantages	<ul style="list-style-type: none"> Private sector capital Transfer of risk Commercial and technical expertise 	<ul style="list-style-type: none"> Lower interest rates on available capital can be secured through Prudential Borrowing Transfer of risk on a district heating network through construction contracts More control over strategic direction No profit needed Incremental expansion more likely Low set-up costs (internal accounting only)
Disadvantages	<ul style="list-style-type: none"> Loss of control Most profit retained by private sector Incremental expansion more difficult High set-up costs 	<ul style="list-style-type: none"> Greater risk Less access to private capital and expertise, though expertise can be obtained through outsourcing and specific recruitment

Table 10.5: Advantages and Disadvantages of ESCo models

10.6 The role of education

The uptake of successful Renewable and Low Carbon energy schemes requires the full buy-in of local communities. Feedback from the workshops held for this study highlighted the fact that many residents, whilst potentially interested in issues around climate change and energy, are primarily driven by cost of energy and are either unwilling, or unable to accept changes to energy supply which may impact their local environments or energy costs. The key factor in this was identified as a lack of understanding of the issues around energy supply and climate change, and the role in which Renewable and Low Carbon technologies can take.

The local authorities and County Council should take an active role in educating Hertfordshire residents about the requirements for, and benefits of Renewable and Low Carbon technologies. This could be through both community engagement, and education through schools and colleges. In particular there is a need to provide accurate and reliable sources of information around controversial technologies such as wind turbines and energy from waste, to help dispel much of the unscientific research and information which is used by anti-campaigners.

At a grass roots level, a highly popular idea discussed by many workshop attendees was the use of schools as demonstration grounds, where suitable technologies are installed as an education aid to both parents and children. Perhaps the most appropriate option is to install small scale turbines (typically 10 – 20m tall) in school playing fields, and this has already been done at certain schools in Hertfordshire. Alongside this, the local authorities and County Council could encourage or enforce developers of energy schemes to engage with local communities and schools in an educational role, for example arranging site visits and open days. An example of where this can be achieved is requiring waste site operators with council waste contracts to meet certain educational criteria.