



Low Carbon Action Plan

A Plan for Reducing Carbon Dioxide Emissions and Improving Energy Efficiency across Warwick District

Prepared for
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Annex II – Policy Context and Delivery Models

Annex III – Energy Efficiency in Buildings

Annex IV – Low and Zero Carbon Technologies

Annex V – Transport

Glossary

Glossary	
/a	Per annum
10% onsite renewables	A planning requirement which stipulates that the developer must demonstrate that 10% of the developments energy demand (calculated using a standard assessment method) will be met from an on-site renewable energy system.
AD	Anaerobic Digestion Process in which organic materials are broken down in the absence of oxygen producing biogas which can be burnt to produce electricity and/or heat.
Air tightness	The term used to describe the leakiness of the building fabric. An airtight building will resist most unwanted and uncontrolled air infiltration while satisfying its fresh air requirements through a controlled ventilation strategy.
Annual energy demand	The amount of energy required (e.g. to heat a building) each year before the efficiency of the system is accounted for
Annual energy consumption	The amount of energy consumed (e.g. by a boiler) each year which is the demand divided by the efficiency of the system
AS Allowable Solutions	A mechanism by which carbon emissions in new build developments may be offset by investment in "Allowable Solutions" which might include a list of local authority-defined carbon reduction projects (including retrofit schemes or renewables).
ASHP	Air Source Heat Pump A heat pump installation that uses the air as a heat sink to store heat or as a source of heat.
BAU	Business As Usual

Glossary	
Biomass	Any plant-derived organic matter. Biomass available for energy on a sustainable basis includes herbaceous and woody energy crops, agricultural food and feed crops, agricultural crop wastes and residues, wood wastes and residues, aquatic plants, and other waste materials including some municipal wastes. Biomass is a very heterogeneous and chemically complex renewable resource.
Biomass CHP	Combined Heat and Power fuelled by biomass
Building Regulations	Building Regulations set standards for design and construction which apply to most new buildings and many alterations to existing buildings in England and Wales.
Cavity wall insulation	Insulation injected into the wall cavity as a retrofit measure. Insulation is typically a broken down form of mineral wool or polystyrene beads which are blown in through holes drilled into the outer brick skin.
CERT	Carbon Emissions Reduction Target Requires all domestic energy suppliers with a customer base in excess of 250,000 customers to make savings in the amount of CO ₂ emitted by householders. Suppliers meet this target by promoting the uptake of low carbon energy solutions to household energy consumers, thereby assisting them to reduce the carbon footprint of their homes.
CESP	Community Energy Saving Programme CESP targets households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. There are 4,500 areas eligible for CESP. CESP is funded by an obligation on energy suppliers and electricity generators. It is expected to deliver up to £350m of efficiency measures.
CHP	Combined Heat and Power Generation of both heat and power from a single heat source, usually by recovering waste heat from electricity generation.
CIBSE	Chartered Institute of Building Services Engineers

Glossary	
CIL	<p>Community Infrastructure Levy</p> <p>Since April 2010 local authorities have been empowered to raise funds through CIL from developers undertaking new projects in their area. The money can be used to fund a wide range of infrastructure that is needed to support the new development, including energy schemes such as district heating. Most new buildings used by people over 100 sqm are liable to pay the levy.</p>
CLG	<p>Department for Communities and Local Government</p> <p>Aims to foster prosperous and cohesive communities, offering a safe, healthy and sustainable environment for all. Information about activities and policies.</p>
CO ₂	Carbon Dioxide
Commercial solar thermal	>10m ² solar thermal panels which generate hot water for use in non-domestic buildings
Commercial wind	Large scale wind, for this study this is assumed as being above 1 MW in capacity (tip height typically greater than 100 m). Where appropriate, the default size of large scale wind turbines is 2.5 MW with a tip height of approximately 125 m.
Communal heating	A central heat source such as a large boiler, CHP or heat pump installed to serve a number of dwellings in the same building, usually via radiators. Heat (and sometimes electricity) is sold to the building occupiers (rather than fuel) and consumption is monitored using meters installed in each dwelling.
Condensing boiler	Condensing boilers have bigger heat exchangers that recover more heat from the burning gas, making them more efficient than conventional boilers. Condensing boilers can either be regular or combination boilers.
CRC	<p>Carbon Reduction Commitment</p> <p>The CRC is a mandatory scheme aimed at improving energy efficiency and cutting emissions in large public and private sector organisations. These organisations are responsible for around 10% of the UK's emissions. The scheme features a range of reputational, behavioural and financial drivers, which aim to encourage organisations to develop energy management strategies that promote a better understanding of energy usage.</p>

Glossary	
CSH	<p>Code for Sustainable Homes</p> <p>The Code is the national standard in England for the sustainable design and construction of new homes. The Code aims to reduce carbon emissions and create homes that are more sustainable by measuring the sustainability of a new home against nine categories of sustainable design.</p>
DECC	<p>Department for Energy and Climate Change</p> <p>Key priorities are to: Save energy with the Green Deal and support vulnerable consumers; Deliver secure energy on the way to a low carbon energy future; Drive ambitious action on climate change at home and abroad; Manage our energy legacy responsibly and cost-effectively</p>
DfT	<p>Department for Transport</p> <p>Responsible for transport issues (except when devolved), in particular railway franchising and a range of executive agencies. Policy papers and speeches.</p>
Distributed energy	<p>Medium scale (>50kW) energy systems usually installed in non-domestic buildings.</p>
District heating	<p>A central heat source such as a large boiler, CHP or heat pump is installed to serve a number of buildings, usually via a network of super insulated pipe. Heat (and sometimes electricity) is sold to the building occupiers (rather than fuel) and consumption is monitored using meters installed at each building that is connected to the network.</p>
Domestic solar thermal	<p><10m² solar thermal panels which generate hot water for use in domestic buildings</p>
Double glazing	<p>Glazing which has two panes of glass separated by an air or gas filled gap</p>
ECO	<p>Energy Company Obligation</p> <p>ECO will place one or more obligations on energy companies requiring them to generate a specific amount of credit by facilitating the installation of energy efficiency measures in homes in Great Britain before a set deadline.</p>
EnerPHit	<p>Energy Efficient Passivhaus Retrofit</p> <p>Whole house retrofit to Passivhaus certification standards.</p>

Glossary	
ESCO	<p>Energy Services Company</p> <p>This is a professional business providing a broad range of comprehensive energy solutions including designs and implementation of energy savings projects, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.</p>
FITs	<p>Feed in Tariffs</p> <p>A UK Government cashback scheme outlined in the Energy Act 2008 effective from 1 April 2010 guaranteeing payment to people who generate small scale low carbon electricity.</p>
Gas CHP	<p>Combined Heat and Power fuelled by gas</p>
Green Deal	<p>The Green Deal is a new funding mechanism (market framework) that will allow households and businesses to install energy efficiency measures at no upfront cost. Instead the measures are paid from a loan which is attached to the property rather than the occupier. The loan is then repaid (with interest) by a charge on the occupier's electricity bill. Should the occupier move the obligation to pay the loan becomes the responsibility of the new occupier or bill payer.</p>
GSHP	<p>Ground Source Heat Pump</p> <p>A heat pump installation that uses the earth as a heat sink to store heat or as a source of heat.</p>
GW	<p>Gigawatt = 1,000,000kW</p> <p>Unit of power or the productive capacity.</p>
GW e	<p>Gigawatt electrical</p> <p>Unit of electrical power.</p>
GW th	<p>Gigawatt thermal</p> <p>Unit of thermal heating power.</p>
GWh	<p>Gigawatt hour = 1,000,000kWh</p> <p>Unit of energy</p>
GWh e	<p>Gigawatt hours of electrical energy</p> <p>Unit of electrical energy</p>
GWh th	<p>Gigawatt hours of thermal energy</p> <p>Unit of thermal energy</p>
ktCO ₂	<p>Kilotonnes of Carbon Dioxide = 1,000tCO₂</p>

Glossary	
kW	Kilowatt = 1,000W Unit of power or the productive capacity.
kWh	Kilowatt hour Unit of energy 1kWh = 1,000W x 1 hour
kWp	Kilowatt peak Maximum power output of a photovoltaic cell, occurring with intense sunlight.
Large scale energy	Large scale (>1MW) energy, usually installed as independent generators or sometimes in non-domestic buildings.
Loft insulation	Quilted insulation which is laid on the floor of a loft void, creating a cold space above.
LZC	Low and Zero Carbon
Medium hydro	Hydroelectricity systems with a capacity greater than 50kW
Medium wind	Wind turbines with a capacity greater than 50kW
Micro hydro	Hydroelectricity systems with a capacity less than 50kW
Micro wind	Wind turbines with a capacity less than 50kW
Microgeneration	Small scale (<50kW) energy systems, usually installed in domestic and non-domestic buildings
MW	Megawatt = 1,000kW Unit of power or the productive capacity.
National Housing Policy	The collective term for all nationally implemented policies related to housing. The current government's housing policy is set out in their publication, Laying the Foundations: A Housing Strategy for England, November 2011
NPPF	National Planning Policy Framework. The NPPF seeks to consolidate the more than 1,000 pages of existing national planning policy into a clearer, simpler and more coherent form which will be easier to understand and to put into practice. The NPPF was published in draft from during 2011. Public consultation ended in October 2011 and the final version has not yet been published.

Glossary	
Passivhaus	A performance standard for both domestic and non-domestic buildings. First conceived in Germany but now used throughout the world, the standard is energy focused and so does not rely on other aspects of sustainability, nor does it preclude them. Certification criteria include a limit to the space heating/cooling demand or load, a limiting target for air tightness, a limit to primary energy demands and a limit to the frequency of overheating.
Realistic 15 year potential	An assessment of the potential deployment within the district for a given technology over the next 15 years in what we have deemed to be a realistic limit, given the limitations in application of the technology itself, the limitations of the various applicable funding mechanisms and the limitations within the policy context.
Retrofit	Measures installed on existing buildings
RHI	Renewable Heat Incentive A UK Government cashback scheme outlined in the Energy Act 2008 effective from November 2011 for non-domestic generators, guaranteeing payment to people who generate heat from renewable resources.
ROCs	Renewable Obligation Certificates Renewables Obligation Certificates (ROCs) are green certificates issued by the Authority to operators of accredited renewable generating stations for the eligible renewable electricity they generate. Operators can then trade the ROCs with other parties, with the ROCs ultimately being used by suppliers to demonstrate that they have met their obligation.
Solar PV	Solar Photovoltaic Solar panels which generate electricity.
Solid wall insulation	Insulation applied either internally by dry-lining or externally by cladding
tCO ₂	Tonnes of Carbon Dioxide

Glossary	
The Localism Agenda	The Localism Agenda drives many other policies, such as the National Planning Policy Framework, and is a fundamental element of the Coalition Agreement. It marks a significant change in national policy and politics. The central idea is a shift from big government to the big society through decentralisation and a process of giving power back to people and communities.
Theoretical potential	An assessment of the maximum deployment potential within the district for a given technology, given only the limitations in application of the technology itself and ignoring other limitations such as timescales, funding and the policy context.
Triple glazing	Glazing which has three panes of glass, each separated by an air or gas filled gap
WDC	Warwick District Council
Whole House Retrofit	A package of energy efficiency measures installed in an existing dwelling with the aim of reducing energy demands and consumption from all aspects of the building including heating, lighting and appliances.

Executive Summary

There are economically advantageous opportunities to reduce Warwick District carbon emissions by around 12% (128,000 tCO₂ per year) over the next 15 years, and this goes half-way towards meeting national carbon budget targets of a 25% reduction against 2009 levels by 2027. The remaining reductions will require national policy interventions, voluntary private sector investment or decarbonisation of the electricity grid.

Delivering this level of reduction could bring around £250 million of external investment into the District over the plan period, and generate annual benefits for the District's residents and the Council of some £25 million a year at current prices.

Delivery projects fall into three categories:

- Energy efficiency projects in buildings
- Use of low and zero carbon technologies for generating energy locally
- Transport projects

Analysis of current and projected energy use in the District shows that by far the biggest opportunity and need is to address energy use in existing buildings and infrastructure. New build is already required to be energy efficient by national standards, although opportunities to incorporate financially advantageous local energy schemes such as district heating and CHP, as well as sustainable urban design to minimise transport emissions, should not be missed when appropriate.

A wide range of still-evolving national policies and regulatory frameworks give local authorities the powers encourage these kinds of projects in ways which benefit the local area and generate revenue. These include the Green Deal, renewable energy incentive schemes, the National Planning Policy Framework, and the Community Infrastructure Levy.

Taking advantage of these mechanisms would require careful thought and almost certainly establishing a local energy services organisation (ESCO) at the right stage. This is because specialist skills, external loan finance, and ability to manage complex revenue streams are all likely to be required. However, strong local authority control of and support for such a body is fundamental to its viability, and District Council ownership is the simplest way to achieve this.

This Plan proposes the establishment of a District Low Carbon Delivery Task Force as a precursor to the establishment of such an ESCO. This Task Force would include relevant local private sector partners and community stakeholders, and take responsibility for development and delivery of this Low Carbon Action Plan over the next 18 months as the national policy context becomes clearer.

1. Introduction

1.1 Project Scope

The Council commissioned Encraft to deliver a study into carbon reduction and energy efficiency options in order to be able to make fully-informed decisions in a changing policy environment.

There are clear benefits from well-informed and executed projects in the affordability of energy to residents and businesses, and there may be much wider economic and financial opportunities for the Council and District.

Carbon reduction and energy efficiency is a high profile and high priority area for the government nationally, and a range of incentive schemes and opportunities for local leadership are emerging from an on-going political process in Westminster. Some of these schemes and policies create real long-term financial opportunity for the Council; others may create powerful institutions and structures which the Council will need to relate to in an informed way to secure optimum outcomes for citizens of the District.

The Council will need to decide whether it should play the role of provider, partner, supporter or customer in the different marketplaces that emerge in the foreseeable future.

The fundamental starting point for the plan is a clear and robust evidence base of up to date energy and carbon data. The scope of this study included consolidating and collating existing data from a wide range of sources relevant to energy and carbon management, but did not include gathering any new data.

1.2 Stakeholder Engagement

An exploratory workshop was held on 2 February 2012 with key internal stakeholders from within the Council. The workshop was designed to test the outcomes of the data gathering and modelling exercises to ensure the Council felt it had all the data and understanding required to make informed choices on delivery models and project prioritisation.

The workshop enabled us to present our findings from the initial evaluation the policy context and of current and forecasted energy demands. We also had the chance to systematically go through each technology option and delivery model opportunity to ensure stakeholders had the chance to raise any issues and reach a consensus on priorities for investments moving forward.

1.3 Report Structure

This report contains an action plan for reducing carbon emissions and improving energy efficiency across Warwick District. The plan includes an overview of the recommended delivery model, a list of prioritised projects and a summary of next steps.

The plan has evolved following full consideration of the evidence base and key findings of this evaluation are summarised in Section 2 of this report, with the full detail of the evidence base is presented in five supporting Annex documents. Each Annex is provided as a standalone report, covering the following topics:

- Annex I – Current and Future Energy Demands
- Annex II – Policy Context and Delivery Models
- Annex III – Energy Efficiency in Buildings
- Annex IV – Low and Zero Carbon Technologies
- Annex V – Transport

2. Evidence Base

2.1 Current and Future Energy Demands

To gain an understanding of current and future energy demands in Warwick District Council, a forecasting model was built around the representation of district wide energy demands shown in Figure 1.

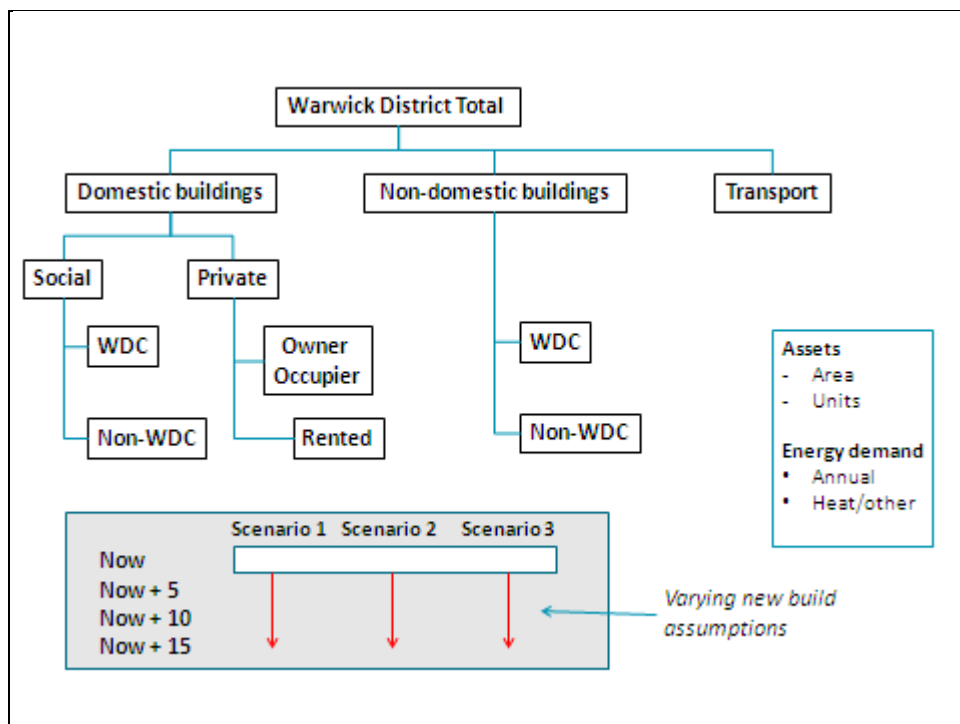


Figure 1 – First cut scope of energy model as baseline for Low Carbon Action Plan

Energy models were created matching the Council's existing three scenarios for expected growth over the next 15 years. These cover the three main sectors: Domestic and Non-Domestic Buildings and Transport. The models for each sector describe energy use and carbon dioxide emissions using a range of data sources including publicly available National Statistics datasets and District specific local data provided by the Council, as detailed in Annex I. The models combine to give an overall picture for energy use.

Key findings of the energy modelling are:

- The biggest challenge in buildings is the existing stock
- There is limited scope for improvements on requirements for new buildings because current Building Regulation standards are already relatively good
- Existing private sector housing is responsible for around 91% of total emissions within the domestic buildings sector
- Existing private sector non-domestic buildings are responsible for around 98% of total emissions within this sector

- Less District-level data available is available on transport compared to the building sectors. However, transport is estimated to be the largest contributor to total emissions and total spend in the District
- The biggest challenges for the transport sector are influencing behaviour and upgrading infrastructure
- Road transport is responsible for 98% of total emissions within the transport sector

Current energy demands are summarised in Table 1.

Table 1 – Current energy demands in Warwick District Council

	Domestic Buildings	Non-Domestic Buildings	Transport	Total
Energy use (GWh/a)	1,081	889	1,517	3,487
Carbon dioxide emissions (ktCO ₂ /a)	287	319	457	1,063
Fuel expenditure (£million/a)	£55 m	£42 m	£212 m	£309 m

Sources for this data are listed in Annex I.

Future energy demands for buildings were forecasted assuming Business As Usual (BAU). This means that all new buildings in each of the three growth scenarios are built to meet the minimum standards required by Building Regulations within the given timeframe and all existing buildings remain as they currently are today.

Future energy demands for transport were forecasted using top down forecasts from the Department for Transport.

The three forecast models combine to give an overall prediction for the BAU change in carbon dioxide emissions over the next 15 years as summarised in Table 2.

Table 2 – BAU forecast for carbon dioxide emissions arising from all sectors

Now +15 years	Scenario 1 – HIGH	Scenario 2 – MEDIUM	Scenario 3 – LOW
Percentage increase in district wide carbon dioxide emissions	4%	1%	-1%

2.2 Policy Context

Development of the Council's Low Carbon Plan is taking place in a changing and challenging national regulatory and policy environment. This environment is important

to the Plan because to an increasing extent the Council needs to identify which policies offer specific financial or carbon saving opportunities, and how best to access these.

For the purposes of this evidence base, twelve potentially significant policy areas were identified for review with officers, and each was assessed systematically for impact on the Low Carbon Plan for the District. The results of this assessment are summarised in Annex II.

The twelve policy and regulatory areas are:

- The Localism Agenda
- The National Planning Policy Framework (NPPF)
- National Housing Policy
- Community Infrastructure Levy (CIL)
- Council powers to run Energy Service Companies (ESCOs)
- CRC Energy Efficiency Scheme
- Building Regulations and Allowable Solutions
- Code for Sustainable Homes (CSH)
- The Green Deal
- Energy Company Obligation (ECO)
- Feed in Tariffs (FiTs)
- The Renewable Heat Incentive (RHI)

Note that transport-related policies were not considered within the scope of this review (although local transport projects were, see Section 2.5 of this report and Annex V). This is because the scope for District Council engagement in and implementation of national transport policies or regulations is much more limited compared to building and planning related policies, and the potential scope was thus too broad and diffuse to be meaningful.

The table below summarises the estimated relative financial and carbon saving opportunities from each of the selected policy areas for Warwick District. Details of the policy areas or schemes are covered in Annex II.

It's important to note that these figures are broad estimates. For some areas, specifically the Community Infrastructure Levy, National Planning Policy Framework and Green Deal (all areas where there is still considerable political debate and uncertainty nationally) the figures need to be treated with caution and should not be viewed in isolation. For example, the CIL figure is based on a top down split of a £1 billion figure quoted by central government as potentially available to local authorities through this mechanism (divided equally between authorities) and as the detailed mechanisms are not yet agreed or defined the eventual figure may vary significantly from the one quoted.

However, we have left these estimates in this report because the **relative** magnitudes of likely funding streams are relevant for planning purposes at this stage, and this

analysis does provide a meaningful guide to these relativities. The basis for each estimate is provided in Annex II.

Table 3 – Estimated local policy potential

Policy	Capital	Revenue	ktCO ₂ /a	Comment/constraint
Localism	-	-	-	Greater freedom and flexibility (and risk)
National Housing Policy	£0.5 m	£0.3 m	-	Based on new homes built
National Planning Policy Framework (NPPF)*	£16 m	£0.6 m	4	Priority to create robust Local Plans. Financial estimate based on 10% renewables requirement
Community Infrastructure Levy (CIL)	£3 m	£0.04 m	0.75	Requires list of projects. Estimate of capital potential based on national figures.
Powers to create Energy Services Companies (ESCOs)	£20 m	£2 m	5	Creates route to access private finance. Income and financial potential will depend on model and projects.
Carbon Reduction Commitment (CRC)	-	-	-	Some parts of £50m local spend could be diverted into an ESCO, with the right partners
Building Regulations*	£12 m	£1.6 m	18	Finance from developers for allowable solutions.
Code for Sustainable Homes	-	-	-	
Green Deal*	£60 m	£6.3 m	40	Finance for capital improvements.
Energy Company Obligation*	£42 m	£3 m	16.2	Must use accredited Green Deal suppliers
Feed-in tariffs (FITs)*	£39 m	£2.7 m	10	Guaranteed revenue stream can be used to raise capital
Renewable Heat Incentive (RHI)*	£66 m	£9.1 m	34.5	Guaranteed revenue stream can be used to raise capital
Totals	~£258 m	~£25 m	~128.5	

** These schemes are still under consultation and subject to change.*

The financial and carbon savings indicated are based on assumptions detailed in Annex II. In all cases the estimates are gross and do not make distinctions about the form of the finance – for example, in some cases this is funding available to private building occupiers, in some cases loans, and in some cases direct funding to the local authority. Table 4 below provides indicative estimates of how the type of financial opportunities varies by policy.

In Table 4, revenue estimates are normally dependent on spending the capital sums. ‘Levy’ refers to schemes like the Community Infrastructure Levy (CIL) which enable the Council to raise funds for specific projects. ‘Levered’ is investment by others in their own projects required through Council policy mechanisms (e.g. development planning obligations).

In practice, different types of financial flows can be accessed by adopting different business or operational models. Thus, for example, CIL and Building Regulation levies can be spent on local infrastructure projects, but only if the Council establishes a list of proposed projects that meet the necessary criteria. The larger sums in Table 4 are often loans which might be best managed through public-controlled or owned third parties, to manage risks effectively.

Table 4 – Estimated potential financial opportunity locally during plan period, by type of funding

	Grant	Loan	Revenue	Levy	Levered	Unlocking mechanism
NPPF	-	-	-	-	£16m	Onsite renewables targets
National Housing Policy	£0.5m	-	£0.3m	-	-	Participation in LEP
CIL	-	-	£0.04m	£3m	-	Project list
ESCO	£2-3m	£10-£30m	£1-£3m	-	-	Establish ESCO
Building Regulations	-	-	£1.6m	£12m	**	Allowable solutions list
Green Deal	-	£60m	£6.3m	-	**	Access Green Deal Provider
ECO	£42m	-	-	-	**	Identify eligible houses
FITs	-	£39m	£2.7m	-	-	Develop projects
RHI	-	£66m	£9.1m	-	-	Ownership vehicle
Totals	~£45m	~£186m	~£21m	~£15m	~£16m	

** These schemes are all designed to encourage (or require) private investors and developers to inject additional funding of their own, but it's too early to be able to estimate the potential amounts.

2.3 Energy Efficiency in Buildings

Cutting carbon dioxide emissions is often most cost effective when taking a fabric first approach to improving energy efficiency in buildings. Reducing demands in this way will also lead to other benefits for the District such as improved long term fuel security and reduced fuel poverty.

One of the biggest challenges in reducing energy use in the District is with the existing and privately owned building stock. Despite a history of grants and incentive schemes designed to encourage homeowners to install simple energy efficiency measures, there still remain a vast number of unfilled cavities and poorly insulated lofts, leaving significant scope for improvements in this area.

Improving energy efficiency in new build developments to go beyond current Building Regulation standards can only have a limited impact in terms of reducing carbon emissions, but the Council may have more power to influence the new build sector where policies may be easier to implement and regulate compared with in existing buildings.

Table 5 summarises a realistic 15 year potential for improving energy efficiency in buildings in the district.

Table 5 – District wide potential for improving energy efficiency in buildings over the next 15 years

Sector	Measure	Capital cost	Annual savings	Annual revenue
Domestic Retrofit	Comprehensive energy efficiency programme	£125 m	138.6 GWh 36.2 ktCO ₂	£7.64 m
Non-Domestic Retrofit	Upgrade all existing buildings to CIBSE Good Practice	£19.5m	44.9 GWh 14.3 ktCO ₂	£1.9 m
Domestic New Build	Require 646 new homes to meet Passivhaus certification	£11.6 m	1.9 GWh 0.8 ktCO ₂	£0.4 m
Non-Domestic New Build	Require 0.5km ² new buildings to meet Passivhaus certification	£10.4 m	6.8 GWh 2.7 ktCO ₂	£0.4 m
	Total	£166.5	192.2 GWh 54 ktCO₂	£10.34

These headline figures draw from a wealth of measures and example projects considered individually in Annex III.

All measures considered for domestic retrofit are summarised in the table below, and are ranked in order of (partly subjective) merit, as assessed by scoring each according to the following three determining factors:

- Rate of return for the example project as 15 year realistic potential
- Cost per tonne of carbon dioxide emissions saved over 15 years¹
- Risk score

Table 6 – The potential for domestic retrofit in WDC, ranked by financial return, cost of CO₂ saving and risk

Measure	Realistic 15 year potential	Capital cost	Annual savings	Annual revenue	Rate of return	Cost per tonne of CO ₂ saved	Risk Score
Condensing boiler upgrade	10,464 homes	£18.8 m	43.7 GWh 10.0 ktCO ₂	£2.0 m	2.64%	£125	8
Cavity wall insulation	5,248 homes	£3.41 m	15.8 GWh 3.6 ktCO ₂	£0.7 m	24.57%	£63	10
Communal gas heating in purpose built flats	1,347 homes	£1.27 m	4.3 ktCO ₂	£3.4 m	40.23%	£19	15
Loft insulation from <125mm to >270mm	6,459 homes	£2.26 m	6.6 GWh 1.5 ktCO ₂	£0.3 m	14.82%	£100	16
Air tightness	8,982 homes	£4.5 m	10 GWh 2.3 ktCO ₂	£0.46 m	10.43%	£130	16

¹ Excludes income

Measure	Realistic 15 year potential	Capital cost	Annual savings	Annual revenue	Rate of return	Cost per tonne of CO ₂ saved	Risk Score
Low Cost Package	3,000 homes	£8.4 m	16.9 GWh 3.9 ktCO ₂	£0.77m	3.21%	£143	28
Floor insulation for suspended timber floors	1,310 homes	£1.04 m	1.4 GWh 0.3 ktCO ₂	£0.06 m	3.25%	£231	26
Double glazing to replace single	1,648 homes	£10.3 m	6.1 GWh 1.4 ktCO ₂	£0.3 m	-5.59%	£490	8
Triple glazing to replace double	1,706 homes	£14.9 m	3.4 GWh 0.8 ktCO ₂	£0.15 m	N/a	£1,241	8
Solid wall insulation	2,620 homes	£34.1 m	27.5 GWh 6.3 ktCO ₂	£1.3 m	-2.45%	£361	47
Whole House Retrofit	599 homes	£23.9 m	7.4 GWh 1.8 ktCO ₂	£0.36 m	N/a	£885	30

2.4 Low and Zero Carbon Technologies

There is a wide range of low and zero carbon technologies which may be suitable for installation in Warwick District Council. The viability of each technology is site specific and although most technologies are viable for implementation within the District, some will have a higher potential for application than others.

A number of technologies have been reviewed for implementation in WDC. Full details of this evaluation are presented in Annex IV where technologies are assessed at three levels of scale:

- Microgeneration options
- Distributed renewable energy options
- Large scale renewable energy options

Annex IV is offered as a series of independent technology briefings which should prove a useful reference point for evaluating the potential of projects in future. Each briefing presents the theoretical potential, the realistic potential and an example project with cost benefit analysis and risk assessment.

The theoretical potential of each technology is an estimate of the maximum opportunity for implementation throughout the District, given the nature of the technology and its propensity to succeed in different site conditions. Where appropriate, we have used data from previous studies in order to arrive at an estimate for the maximum potential, and otherwise made our own estimate based on prior experience or knowledge. We have also calculated a realistic potential in order to give an indication of the scale of investment and revenue that should be attainable for each technology within the next 15 years. Theoretical and realistic potentials are summarised in the table below as a sum total across all technologies considered in this study.

Table 7 – District wide potential for all low and zero carbon technology projects

	Capacity	Capital cost	Annual savings	Annual revenue
Theoretical potential	218.6MWe, 308MWth	£760.9m	485GWhe, 88GWth, 421ktCO ₂	£129.1m
Realistic 15 year potential	72.5MWe, 21.8MWth	£203.9m	152GWhe, 22.8GWth, 110.7ktCO ₂	£32.3m

For each technology we have also considered an example project and assessed the capital cost and cash flow over a lifetime appropriate to each technology (e.g. incentive lifetime). We have ranked the projects (with input from a stakeholder workshop) based on the cost per tonne of CO₂ saved² the risk and the rate of return to give a prioritised list of technologies.

² Excludes income

The table below shows the prioritised list of technologies. Brief notes on each technology are provided to emphasise that the ideal scenarios have been considered for each project.

Table 8 – Prioritised list of Low and Zero Carbon Technologies for WDC

Technology	Example Project System Size	Cost per tonne of CO ₂ saved	Risk Score	Rate of Return	Notes
Domestic GSHP	10kW	£70	34	34.42%	Based on ideal individual sites for installation
Medium Wind	100kW	£127	20	18.36%	Based on good wind resource and low turbulence
Domestic Biomass	12kW	£99	37	43.88%	Based on ideal individual sites for installation
Gas CHP	50kWe 80kWth	£105	22	10.50%	Assumes annual demand of a leisure centre
Biomass CHP	50kWe 95kWth	£40	50	26.92%	Assumes annual demand of a leisure centre
Micro Wind	11kW	£147	36	26.37%	Based on good wind resource and low turbulence
Domestic PV	53 x 2kWp	£227	20	10.64%	Assumes no shading
Commercial PV	50kWp	£152	30	15.28%	Assumes no shading
Domestic ASHP	10kW	£750	34	51.46%	Based on ideal individual sites for installation

Technology	Example Project System Size	Cost per tonne of CO ₂ saved	Risk Score	Rate of Return	Notes
Commercial wind (FITs)	1MW	£88	47	15.45%	Based on good wind resource and low turbulence
Anaerobic digestion	435kW	£55	42	9.32%	Assumes electrical generation only
Medium Hydro	48kW	£191	36	10.30%	Based on the Mill Bridge and Princes Road schemes
District heating (town centre)	124kWe 198kWth	£300	41	11.03%	Assumes connection of Council and private buildings
Commercial wind (ROCs)	1MW	£88	47	7.68%	Based on good wind resource and low turbulence
Commercial Solar Thermal	70kW	£557	26	-0.92%	Assumes annual demand of a leisure centre
Domestic Solar Thermal	3kW	£889	28	2.86%	Assumes no shading
District heating (new development)	150kWe 300kWth	£2,083	41	-0.09%	Assumes development of energy efficient homes
Micro Hydro	9.3kW	£285	51	-1.50%	Assumes constant annual river flow

2.5 Transport

The scope to manage carbon emissions due to transport in the District is limited because a significant proportion of emissions are due to journeys through the District by people and vehicles over which the Council has no control (traffic on the M42, long-distance rail journeys, etc).

Despite this, transport represents a significant contribution to District emissions, so in Annex V the national outlook for CO₂ emissions from transport is reviewed along with the County Transport Strategy. A wide range of initiatives to reduce emissions are possible locally, but the impacts of these are extremely difficult to quantify with confidence because (unlike building-related projects) cause and effect are rarely directly related and desired outcomes typically require an integrated package of measures and developments (infrastructure, incentives, policies, technical developments, etc) to be pursued coherently over many years to ensure desired outcomes.

The figures in Annex V and the table below should, therefore, be treated with considerable caution: they can be broad estimates only but are included to provide some perspective on the relative scale of the problem and opportunity and figures involved.

The table below summarises four potential projects which might impact CO₂ emissions from transport across the District over the next 15 years.

Table 9 – Summary of projects to reduce CO₂ emissions from transport

Project	Scope	Carbon Savings (ktCO ₂ /a)	Capital Cost	Attributable Savings (£/a)
Promotion of zero emission vehicles	More charging points, promotional campaigns, technical developments, grid decarbonisation, grants, parking incentives	13	£79 m	£11 m
Reducing average vehicle speeds	Speed awareness campaigns, 20mph limits, calming measures, enforcement	24	£0.5 m	£7.6 m
Encourage a switch to cycling	Cycle routes, education, incentives (parking, shelters etc)	0.57	£4 m	£0.3 m
A new railway station in Kenilworth	New station reduces journeys by car	0.032	£6.1m	-

These projects have been selected to illustrate the breadth of project type possible (technical, regulatory, behavioural and infrastructure) and illustrate the range of measures required for all but simple infrastructure investments.

In all cases savings are fuel savings and the benefits flow to individual transport users, while the costs are typically borne by the Council (except for electric vehicles, where the users pay for the capital costs).

3. Low Carbon Action Plan

3.1 Purpose of the Plan

The objective of the Low Carbon Action Plan is to provide a fifteen year framework for carbon reduction and energy efficiency projects and initiatives in Warwick District.

Carbon reduction and energy efficiency are desirable objectives for the Council because they support multiple goals:

- Reducing fuel poverty
- Making energy cheaper for residents and business
- Reducing environmental damage caused by CO₂ emissions
- Creating economic opportunities locally
- Increasing the resilience of energy supplies in the area
- Making Warwick District a more attractive place to live and work

From a technical perspective, these goals are likely to be realised economically by activities and projects which:

- Reduce energy use
- Use energy more efficiently
- Generate energy (also providing resilience and security of supply)

These technical activities are in turn facilitated by initiatives which:

- Encourage more energy efficient behaviours
- Systematically reduce scope for energy consumption through more efficient buildings and infrastructure
- Promote renewable means of generating energy locally

However, these activities and projects typically involve large numbers of stakeholders and are touched by multiple policies and regulations. This Low Carbon Plan is intended to provide a basis for engaging with these stakeholders and for taking informed decisions on key projects and investments in a dynamic regulatory environment.

3.2 The Low Carbon Opportunity in Warwick

Over the next 15 years effective management of the Low Carbon agenda could bring more than £250 million of investment into the District, save District residents more than £25 million a year in fuel bills, and reduce District carbon emissions by more than 128,000 tonnes (see evidence base, section 2.2).

This opportunity is created by a combination of national policies aiming to reduce CO₂ emissions over the next 40 years; rising fuel prices; the localism agenda, and straightforward economic investment and cost saving potential in patterns of energy use locally.

Such a reduction (representing just over 12% of current CO₂ emissions) would represent a significant improvement on “business as usual” projections of increased CO₂ emissions of 4% in the Council’s high-growth scenario (section 2.1) and a small reduction of 1% in the low growth scenario. However, a 12% reduction in District emissions by 2027 from current levels still falls some way short of national and EU targets. The most significant of these for a UK local authority are those set out in the 2008 Climate Change Act and subsequent carbon budgets, which are statutory. They require:

- An 80% reduction in UK CO₂ emissions by 2050 (against 1990 baseline)
- A 50% reduction in UK CO₂ emissions by 2027³.

According to DECC², nationally as at 2010 we have already delivered just over 25% CO₂ reductions against 1990 levels (largely due changes in the fuel mix used in centralised power generation, from coal to gas and economic decline). This means that to stay on track to 80% by 2050 and meet the carbon reduction pathways set out in the first four national carbon budgets a further 25% reduction by 2027 is required. Hence a District contribution of 12% is only half way to what is required, and a business as usual, low growth 1% reduction is about a 25th of the progress expected.

The balance will need to be made up by voluntary private investment or national level action to decarbonise the electricity grid and transport system. However, improving the energy performance of existing buildings is widely regarded as the lowest cost route to carbon reduction, and responsibility for delivering this is likely to fall squarely on local authorities in one way or another.

There are therefore a number of related challenges for the District.

- How best to take advantage of the opportunities in CO₂ reduction that are also financially and economically attractive, in the current policy environment?
- How to mitigate the risk that this policy environment might become more challenging, and require even deeper cuts, which are less economically-viable?
- How to mitigate the related risk that national delivery mechanisms for carbon reduction in the built environment might take power away from those local authorities who aren’t equipped to respond?
- How to mitigate the risk that short-term development and policy decisions might make it harder to deliver long-term targets?

Responding to these challenges requires a co-ordinated approach at some level. This might range from clear responsibility for Climate Change and CO₂ reduction within the Council, through to establishment of a distinct local delivery model for climate change projects, which might in itself take a variety of forms.

However, the starting point is clarity on what activities and projects will actually be involved in responding to this opportunity, and understanding of the best ways to match available funding to these projects. The following sections consider each of these points in turn.

³ UK GREENHOUSE GAS EMISSIONS: PERFORMANCE AGAINST EMISSIONS REDUCTION TARGETS – 2010 PROVISIONAL FIGURES, DECC, July 2011. The 50% by 2027 figure comes from page 2 of this report and is the target emissions at the end of the fourth carbon budget period (2027).

3.3 Prioritised Projects

A clear and comprehensive list of prioritised projects is crucial to the successful delivery of a district wide Low Carbon Action Plan. It is also critical to the successful leverage of potential funds from both the Community Infrastructure Levy and Allowable Solutions.

In order to ensure the Plan is comprehensive, prioritised projects should be selected from each of the three key opportunity areas, presented in the Evidence Base:

- i Energy Efficiency in Buildings
- ii Low and Zero Carbon Technologies
- iii Transport

Projects in each of these opportunity areas have been evaluated in slightly different ways due to their differing nature and differences in the data available and therefore the results are not always directly comparable. In practice, subjective factors such as short-term access to specific funding streams and public engagement with different issues are also likely to affect immediate choices. Nevertheless, a number of recommendations are listed below which are intended to provide a starting point for implementation of this Plan.

Recommendations here are drawn from a detailed analysis of the evidence base, summarised in Section 2 of this report, and we have selected projects which are ranked highly in the prioritisation scoring, with due consideration of feedback from the stakeholder workshop which was carried out as part of this study.

3.3.1 Energy Efficiency in Buildings

We recommend a comprehensive energy efficiency programme to encourage the take up of retrofit measures in both domestic and non-domestic buildings together with district level policies that require more stringent targets for new builds. Suggested projects to focus on include:

- A programme of advanced retrofit for WDC assets as an exemplar for the district in both domestic and non-domestic buildings, with a focus on non-domestic buildings with high energy use as identified in the analysis contained in Annex I
- Installation of communal heating in purpose built flats that are currently heated by electric night storage heaters (e.g. The Crest). This could be combined with insulation measures to make an exemplar project
- A programme of basic retrofit for non-WDC housing, with a focus on simple low cost measures that come top of the list of prioritised projects summarised in Table 6 (loft and cavity wall insulation and condensing boilers)
- An awareness programme and potential policies to encourage non-domestic retrofit across the district to CIBSE good practice standards
- Consider introduction of a policy to require Passivhaus certification for selected (e.g. large scale) new build developments

The rationale for suggesting Passivhaus rather than the Code for Sustainable Homes (CSH) as a standard is that it is simpler and focused exclusively on energy and carbon reduction, which is the focus of this plan. CSH is already an accepted standard for social housing, but has been widely resisted in the private sector because it is not seen as the most cost-effective way to deliver carbon reductions and incorporates a range

of social objectives under the broad label of sustainability. In contrast, Passivhaus places strong emphasis on building fabric improvement (energy efficiency) and quality of build (air tightness) which are the lowest cost (and most direct) approaches to CO₂ emission reduction in most cases and which will deliver very long-term benefits to the district.

Although the cost estimates in this report allow for extra costs to achieve Passivhaus, reflecting current industry estimates, in principle Passivhaus is achievable by developers at limited (if any) additional cost once they are used to the approach because the main requirement is attention to detail and skilled construction teams – achievable by good quality delivery and good practice rather than requiring investment in additional equipment. In contrast, the CSH incorporates a range of broader sustainability requirements (for example including awarding points for location and investments to maintain biodiversity) which may be more appropriately addressed separately within the planning system.

This report has modelled the impact of requiring Passivhaus standards to be met on 5% of new developments in the District. This could, for example be achieved by requiring a minimum of 5% of units on any development larger than 20 houses to meet Passivhaus standards, and increasing this percentage progressively over time as compliance costs fall and developers and local builders acquire the necessary skills.

Such an approach will also potentially give local developers and construction companies a relative advantage (head start) in the wider national market by acquiring the relevant skills as these standards become more prevalent over the next 5-10 years.

3.3.2 Low and Zero Carbon Technologies

We recommend implementation of a targeted installation programme for appropriate technologies on Council owned buildings in order to showcase examples of best practice and provide an exemplar for the district to encourage take up in the private sector. Changes at policy and planning level could help further by removing barriers to take up. Suggested projects to focus on include:

- A programme of heat pump and biomass installation in rural, off gas areas, using projects already completed or in the pipeline for WDC housing as an exemplar
- A programme of solar PV installations on WDC owned assets, continuing with projects already in the pipeline
- Press ahead with plans to install hydro turbines at Mill Bridge and Princes Drive, since detailed feasibility and a business case have previously been completed, this is already a well developed scheme and you are in a good position to take it forward to implementation
- An awareness programme and potential policies to encourage development of medium wind (major risk barrier is planning/project development)
- An installation programme of CHP plants for high energy use (leisure centres and hospitals)

We do not recommend increasing the 10% onsite renewables⁴ requirement in the current local planning policy. Our modelling shows this will have limited impact as Building Regulations tighten. Carbon reductions will generally be more efficiently delivered through encouraging greater energy efficiency in new build via Passivhaus,

⁴ i.e., the developer must demonstrate that 10% of the developments energy demand (calculated using a standard assessment method) will be met from an on-site renewable energy system.

as discussed in Section 3.3.1 above. In addition, for smaller projects (individual houses) the costs of compliance and managing the policy often outweigh the benefits and renewables are in any case better incentivised through other policies such as FITs and RHI.

However, 10% on site renewables does have value and may be the most efficient and cost-effective means to encourage carbon reduction for non-domestic developments and for larger housing developments. The Council should therefore consider simplifying the wording in the policy to limit the 10% requirement to non-domestic developments and housing developments of more than 20 units. It may also be helpful to offer developers flexibility by allowing carbon reduction objectives on new build housing to be met *either* by demonstrating 10% onsite renewables *or* by delivering a percentage of units to Passivhaus standards, as recommended in Section 3.3.1.

3.3.3 Transport

The scope to manage carbon emissions due to transport in the district is limited because the bulk of emissions are due to journeys through the district by people and vehicles over which the Council has no control. However transport remains the largest contributor to carbon emissions in the district and therefore we would recommend the following:

- Encourage a switch to cycling through the development of new, safer cycling routes
- Consider more speed control measures to reduce the average speed of traffic
- Review the current use of electric car charging and develop a long term deployment plan for further charging points (with associated incentives for low emission vehicles such as lower parking fees)

3.4 Accessing funding streams

Tables 3 and 4 in Section 2 identify a range of potential financing options for projects, but as Table 4 indicates, many of these are quite complex to access and some are still contingent on national policies being finalised (albeit in line with strong commitments from central government).

In practice, some financing streams are matched to specific kinds of projects, and the table below summarises the main opportunities and constraints by project type.

Table 10 – Linking funding options to project types

	Approx. scale of funds	Energy Efficiency in Buildings	LZC Technology	Transport
NPPF*	£16m	Yes	Yes	Yes
National Housing Policy*	£0.8m	Yes	Yes	Yes
CIL*	£3m	No	Yes	Yes
ESCO*	£20m	Yes	Yes	No

	Approx. scale of funds	Energy Efficiency in Buildings	LZC Technology	Transport
Building Regulations*	£12m	Yes	Yes	No
Green Deal	£60m	Yes	No	No
ECO	£42m	Yes	No	No
FITs	£39m	No	Yes	No
RHI	£66m	No	Yes	No

* Only the local authority can access these financing options.

It's important to note that the first five of these financing streams are only accessible by the Council, whereas the last four, which are also the largest, can also be accessed by third parties. However, there is considerable scepticism as to whether schemes such as the Green Deal will make much progress (in raising private finance) without the support of local authorities, and early experience with feed in tariffs (FITs) and the pre-cursors of ECO (CESP and CERT) was that the most effective and largest scale schemes were those promoted through or in partnership with local authorities (and social landlords).

Two funding streams, CIL and Building Regulations (via 'Allowable Solutions') require the Council to develop a specific list of infrastructure or LZC projects which meet the criteria of the scheme, and in the case of CIL and Housing Policy funding the money could be spent on non-carbon related projects.

All of these financing streams have the potential to support self-funded delivery models in principle, provided individual projects are selected with care and a sufficiently long-term perspective is taken. So, for example, FITs and RHI are designed to provide internal rates of return of 5% plus on projects on the right sites; ECO is a grant scheme; Green Deal finance is only accessible if projects pay for themselves within the financing term; an ESCO would be a commercially-funded vehicle, and the remaining schemes are all levies or grants providing the Council with variously constrained investment funds.

The challenge is establishing a delivery model with the capability to select the right projects and to secure not only the investment funds but also the revenue streams to repay the investments. It may need initial funding to identify the projects and set up any legal agreements and contracts required to secure revenues, but the first step is to decide on the best form of delivery model.

3.5 Delivery model options

It is clear from review of the evidence base prepared for this report that an effective delivery model in this area is desirable and requires:

- Detailed understanding of a changing policy environment
- Technical understanding (which may vary by project)
- Stakeholder engagement
- Co-ordinated use of local policy levers (e.g., planning policies)

- Political support
- Long-term financial support or the ability to raise finance in a variety of ways

Experience elsewhere suggests this may be difficult, but not impossible, to achieve without a core project of a minimum scale around which to build a dedicated organisation.

For example, Mid-Suffolk District Council announced the formation of an ESCO in October 2011. This is in partnership with a large private sector partner (SITA) and focused around a £185 million waste-to energy scheme. The District Council are able to take a stake in the project and its revenue streams because they have the planning powers to facilitate the infrastructure investment in district heating pipework that will make the project economically viable.

A similar approach was taken by Norfolk County Council (again around a waste-to energy scheme) in 2010, and in this case the core project was supplemented with a vision to use the organisation established also to pursue a range of renewable projects.

The boxes on this page and next summarise other examples of how other local authorities at various scales have approached this issue.

In practice, there are a number of fundamental and related choices that the District need to take to determine the best delivery model locally. These choices are:

- 1 To what extent does the importance of this agenda justify specific organisational focus in this District?
- 2 If a focused organisation is required, should it be within or outside the Council?
- 3 Are there merits in combining with other public authorities (e.g., creating a sub-regional or larger scale delivery body)?
- 4 If an external vehicle is used, how can the Council best control or influence the activities of this vehicle in the interests of the District?

The recommended way forward for Warwick is outlined in the next section, and each of these questions is answered in turn.

DELIVERY MODEL OPTIONS

EXAMPLES FROM ELSEWHERE

Nottingham City Council

Published strategy and action plan

Nottingham developed an action plan with external stakeholders containing a range of projects and policy initiatives managed through various committees and monitored via milestones and deliverables using the Council's existing organisation structures. The emphasis of the plan is largely on behavioural change and communications.

3.6 Recommended Delivery Model

3.6.1 Is a specific organisational focus justified?

From the review of specific project opportunities (see section 3.3) there is no single project of a scale, in the short-term, sufficient to justify establishing an ESCO in its own right (this would require a major regeneration scheme, CHP or District Heating for one of the existing urban centres, or major retrofit programme in a clear regulatory context).

Nevertheless, there is both a financial rationale (access to £250 million of investment funds over 15 years) and a political rationale (requirement to deliver a further 25% CO₂ emission reductions by 2027) for a specific organisational focus on delivery of this Low Carbon Plan. For this reason we recommend the Council establishes some form of group with a mandate to develop and deliver this plan.

3.6.2 Should any delivery body be within or outside the Council?

In the absence of a major (in local terms) energy infrastructure project to act as a focus for an ESCO, the major short-term delivery activities are all likely to either be on assets controlled directly by the Council, or through planning policy and CIL/Allowable Solutions investments. This is an argument for leadership to remain firmly within the Council.

On the other hand, the major impending financial and carbon reduction opportunities are most likely to be in large scale retrofit of private sector housing stock, and this is an area where the Council currently has far less direct influence, skills and experience. Other significant opportunities will arise in major new build developments, potentially using unfamiliar technologies or approaches which are only economic if introduced early in the planning process. There is also a continued likelihood of on-going regulatory and technology change. All these are arguments for engaging in some way with external partners and stakeholders, and ideally aligning their long-term interests with those of the Council and District.

On balance, the best way forward for the Council may be a Council-led **Low Carbon Delivery Task Force** supported by a small number of strategic partners with specific technical skills. This Task Force would work to an agreed terms of reference (see Appendix I for a draft suggestion) be chaired by a political leader (e.g., Portfolio Holder for the Environment) and include representatives of key local stakeholders in delivery

DELIVERY MODEL OPTIONS

EXAMPLES FROM ELSEWHERE

Bristol City Council

Publicly-owned ESCO

Bristol have secured EU funding to establish an ESCO to pursue FIT, RHI and Green Deal projects in the city, and have also announced plans to install two council-owned MW-scale wind turbines. They expect to leverage over £70 million private investment through this vehicle.

of this plan, such as: local energy services companies and organisations, local developers, local community energy groups, and major local employers.

This task force would have a mandate to establish external ESCOs at relevant points in the future, should opportunities arise that mean this would be the best way to deliver specific projects or groups of projects. Such ESCOs should be self-funding or net-contributors to the Council budget, as the evidence base suggests this is entirely feasible within the current and evolving policy and technical frameworks.

3.6.3 Are there merits in combining with other local authorities?

It was noted at the stakeholder workshop that most of the best practice examples discussed are unitary authorities, and none are partnerships across multiple authorities (although both Birmingham and Northampton offer to sell their services to others).

The main reasons for this are that the key success factors for local energy projects are local planning policies and long-term interests in local assets, and it is generally inefficient and counter-productive to pass control of these to third parties.

There is sometimes an argument for seeking scale to support either critical mass (hence the ability to secure access to necessary skills and finance) or to achieve economies of scale in procurement. However, such scale can often be achieved more efficiently by local delivery organisations forming strategic partnerships or selling their own services to other authorities, rather than by starting from the presumption that scale is good and then struggling to find local projects that are willing to engage.

Putting all these reasons together, it is recommended that the delivery model pursued is District-based, and The Council does not get diverted into larger scale collaborations at this stage (other than procurement consortia where this doesn't compromise local interests).

DELIVERY MODEL OPTIONS

EXAMPLES FROM ELSEWHERE

Birmingham City Council *Use of procurement power and scale*

Birmingham are pursuing two major initiatives, a District Energy Company and a major retrofit programme. In both cases their model is to give a private company a long-term mandate to provide energy services in exchange for the Council controlling how the (private) company operates in Birmingham. This works because of Birmingham's scale and purchasing power.

Northamptonshire County Council *Self-funded portfolio ESCO*

Northamptonshire already run their internal energy and carbon management team as a revenue centre, securing income from providing energy management services to public organisations in the area. From 2012 they propose to spin this activity out and form an independent ESCO, owned by the Council, which will be able to facilitate and raise finance for energy projects independently.

3.6.4 How should the Council control any delivery vehicle?

Experience from other authorities suggests that a whole spectrum of organisational models can be used without compromising the Council's ability to control outcomes

and manage risk, provided contracts are negotiated carefully and the right partners chosen.

Thus Birmingham prefer models where they take no ownership stake in the delivery organisation, whether this is a district energy company or Green Deal delivery body. Instead they use the contracting process to ensure that the private sector partner chosen is effectively under the political control of the Council. This is probably an effective way to limit risk to the authority, but may not deliver the best economic outcomes as it does not use the incentives of competition very well.

In contrast, Bristol are taking a wholly-owned approach, which gives them much greater flexibility and control (and financial benefit) although it may expose them more directly to the risks of running energy schemes.

Our view is that the risks of running local energy projects are in practice very low. Provided local authorities choose the right partners, the technologies are generally well-proven and the implementation and operational risks are very manageable and not unfamiliar to any organisation already responsible for a significant asset base. The risks only become significant when the scale of project and distance of the decision-makers from the practical realities are large (which is arguably true for an authority the size of Birmingham).

For this reason we would recommend that the District Council consider taking a significant or controlling stake in any energy projects developed locally. The only reason not to do this would be for financial reasons (e.g., balance sheet impact) which are beyond the scope of this Plan.

3.6.5 Summary

Our recommended way forward is therefore the establishment of a Council-led Low Carbon Delivery Task Force with a defined mandate and supported by a small number of strategic partners, including from the private sector, with the necessary technical, legal and financial skills to develop projects.

This task force should aim to establish a financially viable (self-funded) standalone delivery vehicle over the next 18 months as the policy environment stabilises, particularly around the Green Deal.

3.7 Next Steps

The immediate next step is to establish this Task Force and nominate the necessary strategic partners. We propose this is achieved by running a facilitated invitation-only event to report the findings of this study and seek volunteers to join the Task Force and contribute to the first stages of developing the priority projects.

These first steps (for each of the prioritised projects listed in section 3.3 above) are summarised here.

Table 11 – Next steps for prioritised projects

Project	Short Term	Medium Term	Long Term
A programme of advanced retrofit for WDC assets as an exemplar for the district	Consider becoming a Green Deal Provider. Stock survey to identify opportunities; focus on buildings with high energy use.	Monitor performance and report on lessons learnt. Showcase best practice.	Identify further opportunities in buildings with lower energy use.
Install communal heating at The Crest	Carry out initial feasibility study and tenant consultation prior to installation.	Monitor performance and report on lessons learnt. Showcase best practice.	Identify further opportunities in the privately owned housing stock.
A programme of basic retrofit for non-WDC domestic properties	Consider becoming a Green Deal Provider	Stock survey to identify opportunities and track progress.	Monitor performance and report on lessons learnt.
An awareness programme and potential policies to encourage non-domestic retrofit to CIBSE good practice standards	Review policies and develop an awareness programme. Consider becoming a Green Deal Provider	Stock survey to identify opportunities and track progress.	Monitor performance and report on lessons learnt.
Consider introduction of a policy to require Passivhaus certification for selected new build developments and combine this with a simplification of the current 10% onsite renewables requirements	Review policies. Showcase and support local projects which are aiming for or have already met this standard.	Support development of the local supply chain and skills base to ensure projects can meet the standard.	Monitor performance and report on lessons learnt.
A programme of GSHP and biomass installation in rural, off gas areas	Continue with projects already in the pipeline.	Monitor performance and report on lessons learnt.	Stock survey to identify further opportunities.

Project	Short Term	Medium Term	Long Term
A programme of solar PV installations on WDC owned assets	Continue with projects already in the pipeline.	Monitor performance and report on lessons learnt.	Stock survey to identify further opportunities.
Install hydro turbines at Mill Bridge and Princes Drive	Engage specialist contractors. Obtain necessary permissions from the Environment Agency	Monitor performance and report on lessons learnt.	Survey river to identify additional sites with potential for hydro (e.g. Saxon Mill or Warwick Castle)
An awareness programme and potential policies to encourage development of medium wind (major risk barrier is planning/project development)	Review planning and policies. Identify prime sites and start early consultation with landowners and nearby residents.	Install a Council owned turbine as a demonstration project.	Monitor performance and report on lessons learnt.
An installation programme of CHP plants for high energy use (leisure centres and hospitals)	Showcase existing installations.	Stock survey to identify further opportunities.	
Encourage a switch to cycling through the development of new, safer cycling routes	Research funding opportunities. Identify potential for new routes.	Develop an awareness programme.	Develop new routes.
Review the current use of electric car charging and develop a long term deployment plan for further charging points	Encourage and promote use of existing charging points.		Consider expansion of charging points

In addition, we think the scale of potential new developments in the District over the next 15 years merits a specific focus on getting the best outcomes from the planning system, particularly at development master plan stage where solutions such as district heating and optimised approaches to transport are most effectively considered. This could be achieved by formally reviewing all proposed developments over a minimum scale (e.g., 100 houses or 10,000 sqm) for low carbon project opportunities, if necessary engaging a suitably qualified technical partner to do this as cheaply and efficiently as possible.

Appendix I Draft terms of reference for potential WDC Low Carbon Delivery Task Force

Objectives

The purpose of the Task force is to oversee delivery of the District 15 year Low Carbon Plan. This should be done in a way which:

- Maximises revenue savings and income for the Council, District residents and businesses
- Keeps the Council aligned with national targets and budgets for CO₂ emission reduction
- Maximises economic opportunities locally for local residents and businesses

Scope

The Low Carbon Delivery Task Force will:

- Identify, prioritise and direct practical projects to reduce energy costs and carbon emissions within the Council's own asset base
- Support the creation and secure effective funding and governance of projects and delivery vehicles (including ESCOs) to reduce energy costs and carbon emissions in the private sector as suitable opportunities arise
- Work with relevant Council Departments to encourage optimal use of policies which can be used to leverage funding and third-party activities in to CO₂ reduction projects (e.g., planning policy)
- Engage in the early stage of masterplanning for major new developments locally, to identify and facilitate optimal outcomes in energy and carbon terms, in line with Task Force objectives
- Develop long-term strategic partnerships with relevant organisations, locally-based where possible, to provide expertise and support to the Task Force as required
- Maintain awareness of national and EU policy and regulatory changes which create opportunities for funding or project development locally

Funding

The Low Carbon Delivery Task Force will be self-funding from April 2012, from energy bill savings made in the Council's asset base and revenue from any projects taken forward.

Constitution

The Low Carbon Delivery Task force will be controlled and chaired by the Council and composed of an invited mix of

- Political leaders
- Council officers
- Community groups and projects (e.g., CEW, Action21)
- Relevant local businesses (e.g., Encraft, Act on Energy, Calor, AC Lloyd, Orbit, other developers)