



Low Carbon Action Plan

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

Prepared for
Warwick District Council
Riverside House
Leamington Spa

Author
Helen Brown, Matthew Rhodes and Paul White

Date
10 February 2012

Reference
P2340



Document History

Role	Name	Date
Author	Helen Brown, Matthew Rhodes and Paul White	10 February 2012
Checked	Matthew Rhodes	11 February 2012
Authorised as draft	Matthew Rhodes	12 February 2012

Legal Note

The information which we provide is by way of general guidance only to your situation (so for example we do not provide any assurance that particular savings will be realisable, as they typically depend on user behaviour).

Design recommendations and specifications provided in this report are based on the best professional endeavours of the authors. All calculations are based on the best information available to us at the time of report production. Where third party equipment is referred to we rely on manufacturer performance statements, guarantees and warranties. We are not liable for any errors in calculations or omissions resulting from data provided by the customer or third parties.

Encraft works to all relevant professional standards and is accredited to ISO9001 and ISO14001 by Lloyds Register. We hold professional indemnity insurance as consulting engineers for design to the sum of £5 million.

Contents

Executive Summary	5
1. Introduction	6
1.1 Project Scope	6
1.2 Stakeholder Engagement	6
1.3 Report Structure	6
2. Evidence Base	8
2.1 Current and Future Energy Demands	8
2.2 Policy Context	9
2.3 Energy Efficiency in Buildings	14
2.4 Low and Zero Carbon Technologies	17
2.5 Transport	20
3. Low Carbon Action Plan	22
3.1 Purpose of the Plan	22
3.2 The Low Carbon Opportunity in Warwick	22
3.3 Prioritised Projects	23
3.3.1 Energy Efficiency in Buildings	24
3.3.2 Low and Zero Carbon Technologies	24
3.3.3 Transport	25
3.4 Delivery model options	25
3.5 Recommended Delivery Model	27
3.5.1 Is a specific organisational focus justified?	27
3.5.2 Should any delivery body be within or outside the Council?	27
3.5.3 Are there merits in combining with other local authorities?	28
3.5.4 How should the Council control any delivery vehicle?	28
3.5.5 Summary	29
3.6 Next Steps	29
Appendix I Draft terms of reference for WDC Low Carbon Delivery Task Force	32

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

Executive Summary

There are economically advantageous opportunities to reduce Warwick District carbon emissions by around 12% (128,000 t CO₂ 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.

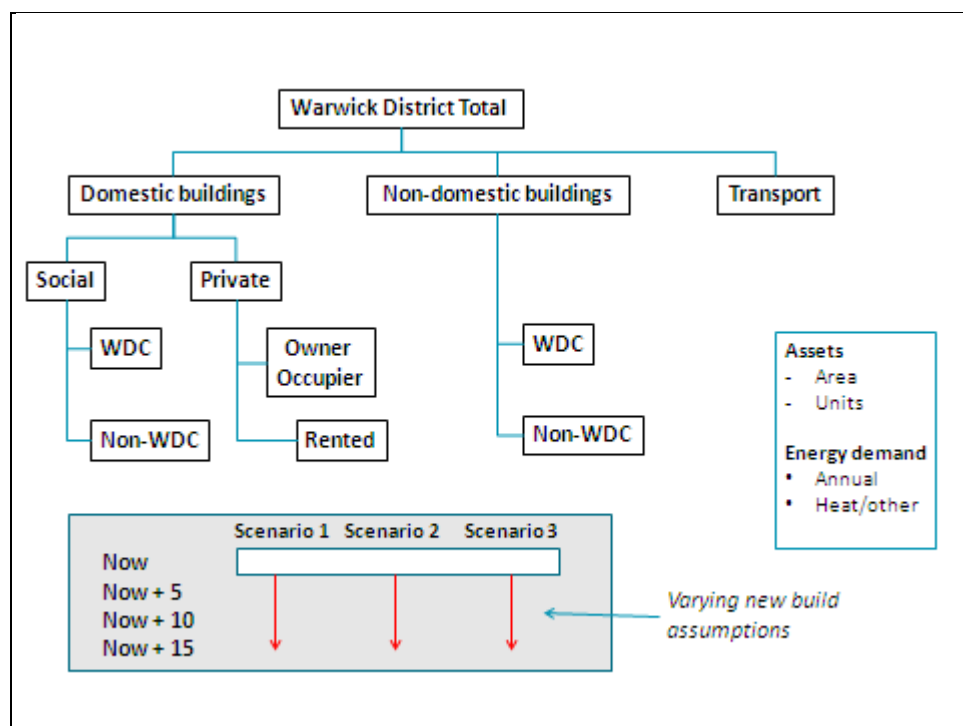


Figure 1 – First cut scope of energy model as baseline for Low Carbon Action Plan

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

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 appendix 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 and appendix 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 appendix 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

Policy	Capital	Revenue	ktCO ₂ /a	Comment/constraint
Community Infrastructure Levy (CIL)	£3 m	£0.04 m	0.75	Requires list of projects
Powers to create Energy Services Companies (ESCOs)	£20 m	£2 m	5	Creates route to access private finance. Income will depend on model
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 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 in order of merit

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 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.

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

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).

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

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)

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 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

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.

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

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.

3.5 Recommended Delivery Model

3.5.1 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.

3.5.2 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.

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.

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 joint public/private **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 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.

3.5.3 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).

3.5.4 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.

3.5.5 Summary

Our recommended way forward is therefore the establishment of a Low Carbon Delivery Task Force with a defined mandate and joint public/private membership, and supported by a small number of strategic partners 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.

3.6 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 10 – 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.

Project	Short Term	Medium Term	Long Term
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	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.
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.

Project	Short Term	Medium Term	Long Term
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, while we have not recommended any changes to the Councils 10% onsite renewables planning requirement, we do 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. 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, and 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)