

# Darlington Sustainable Energy Action Plan

## Foreword

Darlington Borough Council signed the European Covenant of Mayors in January 2009. This committed the Council to produce a Sustainable Energy Action Plan within one year of signing, setting out how it intends to deliver reductions in greenhouse gas (GHG) emissions of at least 20%, based on a 2005 baseline year, by 2020.

All Local Authorities in the North East of England have signed the Covenant of Mayors, the first region in Europe to have achieved this degree of political leadership. It has been agreed with the EU that the Local Authorities in the North East submit the completed SEAPs by the end of October 2010.

This Sustainable Energy Action Plan (SEAP) has been developed using a carbon modelling software tool called Vantage Point that was designed specifically for local authorities in the UK.

This allows the development of scenarios to analyse a range of technologies and carbon reduction measures in housing, transport, and public sector and commercial buildings. The tool also provides indicative net present value and capital costs associated with different carbon reduction measures.

The costs included in this Sustainable Energy Action Plan are the initial indicative costs generated by the Vantage Point software. The Council is working closely with the other 11 North East Local Authorities to explore options to drive down costs and develop robust financial models to fund the priority measures that will contribute to reducing our emissions by 2020. A significant proportion of the measures in our Sustainable Energy Action Plan have multiple benefits (such as reducing fuel poverty), and improving our energy efficiency will save money in the medium term.

The Coalition Government has stated:

*The Government believes that climate change is one of the gravest threats we face, and that urgent action at home and abroad is required. We need to use a wide range of levers to cut carbon emissions, decarbonise the economy and support the creation of new green jobs and technologies. We will implement a full programme of measures to fulfil our joint ambitions for a low carbon and eco-friendly economy.* <sup>1 – ref?</sup>

The UK coalition government is planning to introduce legislation and potential funding mechanisms, such as the Green Investment Bank and freeing local authorities to sell the electricity they generate to support this aim. It is expected that they will publish their proposals in October this year. Until clarity on these mechanisms is established, the scenario that we have developed to inform our Sustainable Energy Action plan is currently the most realistic way of meeting our carbon reduction commitments. It is based on the range of measures currently available to local authorities, the effectiveness of different options to reduce carbon emissions, and a robust analysis of what measures are needed in our local areas.

**Mayor sign off and pic here ?**

## ***Introduction***

In February 2009, Darlington Borough Council signed up to the EU Covenant of Mayors (CofM) obligation and agreed to reduce greenhouse gas emissions within the Borough by at least 20%, from a 2005 baseline, by 2020 and develop a Sustainable Energy Action Plan (SEAP) outlining how the reduction will be achieved.

The Covenant of Mayors is the first EU initiative to directly target local authorities and their communities to tackle climate change.

In signing the Covenant of Mayors, the Council has made a commitment to:

- prepare a baseline emissions inventory
- submit a SEAP detailing measures that will enable a greater than 20% CO<sub>2</sub> reduction by 2020
- Update and re-publish an approved SEAP every 2 years stating the implementation progress of the key actions and the interim results

### ***What is a Sustainable Energy Action Plan (SEAP)?***

The SEAP is a key document that outlines how Covenant signatories will achieve a reduction in greenhouse gas emissions of 20% by 2020. It uses the Baseline Emissions Inventory to identify actions to deliver a 20% reduction. The SEAP is a fluid document and should be revised as circumstances change and/or new opportunities are identified.

### ***Scope of the SEAP***

The SEAP covers action at the local level within the influence of the Council and concentrates on measures aimed to reduce energy consumption by end users, where all associated emissions are apportioned out to the end user. For example all users of the electricity produced by a power station are allocated some of the associated emissions, be it a domestic home or a large industrial user, in proportion to the amount of electricity they use.

The SEAP covers emissions monitored within National Indicator 186 – CO<sub>2</sub> emissions per capita. The sectors covered are domestic, commercial and industrial (excluding industry covered under the EU Emissions Trading Scheme (EU ETS)) and transport.

The SEAP also covers areas where the Council can influence longer term energy consumption through land use planning, encouraging markets for energy efficient products and services through public procurement and changing consumption patterns by working with stakeholders and residents.

## **Overall Strategy**

This Sustainable Energy Action Plan (SEAP) details the strategic, long term carbon reduction target to 2020. The Darlington Climate Change Action Plan is scheduled to be revised and will set out the detailed measures for the short term, which translate the long term strategy and goals contained within the SEAP into action.

### Targets

The overall, long term target is to achieve at least a 20% reduction in carbon emissions against a 2005 baseline by 2020. This target is expressed as an absolute value rather than a per capita reduction. A 20% reduction against a 2005 baseline equates to 157,350 tonnes over the 10 years to 2020.

### Current framework and vision

#### National context

The UN Intergovernmental Panel on Climate Change has determined that the developed countries of the world need to reduce their CO2 emissions by 80% by the year 2050 in order to stabilise the Earth's temperature.

The UK Climate Change Act 2008 sets the national context for Climate Change action in the UK. The Act sets a target for the UK to reduce GHG emissions by at least 80% by 2050.

#### Local context

The long term vision of the Darlington Climate Change Strategy is:-

*To reduce Darlington's contribution to climate change and to minimise the adverse impacts of climate change on Darlington's community.*

The Darlington Community Strategy, 'One Darlington: Perfectly Placed' has as one of its key priorities 'a low carbon Borough tackling climate change'.

Darlington Council approved the Tees Valley Climate Change Strategy in June 2010, which has the vision 'Creating prosperous and resilient communities in a low carbon economy'.

#### Organisational and financial aspects

The SEAP has been developed and will be delivered within the current arrangements for climate change activity within Darlington Borough Council and the Darlington Partnership.

#### Financing the SEAP

The EU is adapting or creating specific financial mechanisms to help local authorities to fulfil their CofM commitments. Increasingly European funding requires that applicants are signatories of the CofM.

Delivery through the Tees Valley Climate Change Strategy (TVCCS) - The implementation of the SEAP can be achieved by developing new finance mechanisms

through the Tees Valley Climate Change Partnership and the Tees Valley Unlimited Business Plan.

European Local Energy Assistance (ELENA) – this grant aims to boost investment projects in the areas of energy efficiency, renewable energy and sustainable transport, replicating successful examples of good practice from other parts of Europe.

European Investment Bank Loan Funding (EIB) – loans are available to public sector bodies for projects that are financially, economically and environmentally sound.

Intelligent Energy Europe Programme (IEE) – this Programme aims to make Europe more competitive and innovative while helping to deliver against ambitious climate change objectives.

European Regional Development Fund – this fund will support energy investments that contribute to improving security of supply, integration of environmental considerations, improvement of energy efficiency and development of renewable energy.

Green Investment Bank (GIB) – details of which are to be confirmed after the Comprehensive Spending Review in the Autumn.

Carbon Emissions Reduction Target (CERT) - CERT came into effect in April 2008, and it obliges energy companies to take steps to ensure that the amount of CO2 emissions from homes is reduced.

Community Energy Savings Programme (CESP) - 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.

## ***Baseline Emission Inventory***

The Baseline Emissions Inventory (BEI) quantifies the amount of CO<sub>2</sub> emissions due to energy consumption within the Borough of Darlington. It identifies the principal sources of CO<sub>2</sub> and their respective reduction potential. Establishing a baseline allows for a meaningful assessment of actions undertaken and a comparison over time.

The baseline year for the SEAP is 2005, in line with the dataset for National Indicator 186. This is the most comprehensive and reliable dataset available for collection. NI186 is reported annually to the Government (DECC), thereby allowing relatively easy annual updates for the CofM.

The BEI is based on final energy consumption data, i.e. the amount of electricity, heating/cooling, fossil fuels and renewable energy consumed by the final end-users.

The scope of the baseline includes final energy consumption data from the following sectors and categories:-

### **Industrial and commercial**

- Electricity use
- Gas use
- Oil and solid fuel use
- Waste combustion for energy generation
- Agricultural processes and fuel use
- Off road machinery

### **Domestic**

- Electricity use
- Gas use
- Oil and solid fuel use
- Home and garden machinery

### **Transport**

- Road transport
- Railways

The baseline does not include:-

- Motorways
- EU Emissions Trading Scheme (ETS)
- Diesel railways
- Land use, Land use change and Forestry

CO<sub>2</sub> emissions are calculated by multiplying the energy consumption for each energy source with the corresponding emission factors. NI186 uses nationally derived emissions factors from the UK inventory. These factors are set by the indicator and will be used in reporting against the CofM commitment

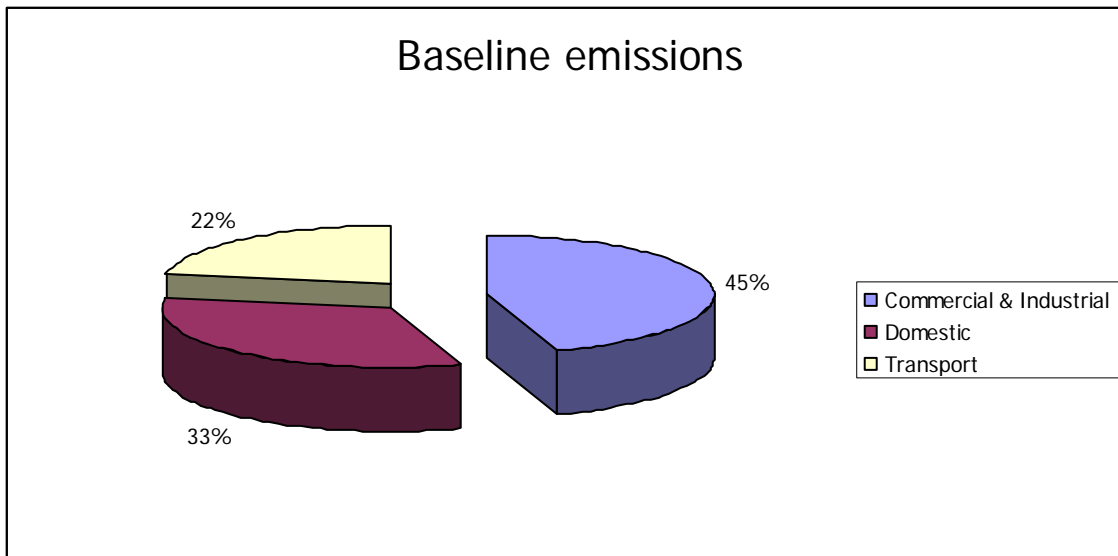


Figure 1

The total carbon emissions for the baseline year, 2005 was 786,750 tonnes. A 20% reduction equates to 157,350 tonnes against this 2005 baseline.

Figure 1 shows the baseline emissions per sector for the baseline year. Commercial and Industrial emissions account for the largest sector emissions with 45% (353,030 tonnes) of the total baseline. This includes public sector emissions. Domestic emissions account for 258,660 tonnes (33%) of the total baseline. Emissions from transport account for 175,060 (22%) of the total baseline.

## ***Key Interventions and actions***

This SEAP is an operational document that sets out a strategic framework for the achievement of the 2020 objectives. It defines reduction measures together with time frames and assigned responsibilities, which translate the long term objectives into action to be taken locally.

The CofM Commitment requires action at the local level, with local authority action expected in each of the roles of:-

### Consumer

Becoming more energy efficient and 'leading by example'. Darlington Borough Council's Carbon Management Plan demonstrates this commitment to lead by example.

### Planner, developer and regulator

The Council is responsible for developing land use policies through the Local Development Framework and transport policy through the 3rd Local Transport Plan. Through these statutory planning process the Council can promote low carbon and sustainable forms of development and ensure sustainable forms of transport are incorporated.

### Advisor and motivator

The Council and its partners have a key role to play in raising awareness within the community of the need for low energy solutions within every sector.

## ***Carbon Scenario Planning***

Planning for an effective climate change response is becoming essential for local authorities. Carbon scenario modelling can provide a fluid model for addressing the uncertainties associated with carbon accounting and allow local authorities to prepare for the most plausible future situations.

The CofM regional support group has purchased Carbon Descent's carbon scenario modelling software 'Vantage Point' to develop scenarios for carbon reduction. It has been designed specifically for local authorities to develop scenarios to inform climate change strategies. The software identifies the carbon savings, capital cost and other economic implications of any given scenario for reducing carbon, providing a thorough cost benefit analysis.

Verified figures on energy production and CO2 savings from all renewable and low carbon technologies and energy efficiency improvements are built into the model, from which the model develops a low carbon scenario. After the specified percentage carbon reduction target is entered (20% in this case), the model calculates the emissions reduction target in absolute (as opposed to percentage) terms, and is then used to produce a reduction scenario based on the basket of measures included.

The following interventions and actions are based on scenario modelling using Vantage Point. Vantage Point includes a number of measures that can be employed to deliver carbon savings. The actions represent the **minimum** measures to be undertaken to achieve a 20% reduction in the Borough's emissions by 2020. While the scenario

outlined represents one way of reaching the target by 2020, this should only be thought of as a guideline and is subject to significant change.



## **Key Elements of the SEAP**

This section is to be read in conjunction with the SEAP template. The paragraphs below provide the narrative for the template.

### **Buildings, Equipment/Facilities and Industry**

#### *Municipal Buildings*

Darlington Borough Council has developed a Carbon Management Plan (CMP), which sets a target of reducing carbon emissions by 25% by 2014 from its own emissions against a 2009 baseline.

#### *Residential Buildings*

##### 1. Cavity wall insulation

From information included in the Home Energy Efficiency Database (HEED) report it was shown that 2578 homes require, and are suitable for, cavity wall insulation. This was from a sample of 17,500 homes in the Darlington LA area. It is expected that the authority will rollout a cavity wall programme up to 2020 and at least 1000 houses will be insulated.

##### 2. Loft insulation

From information included in the HEED report it was shown that 1103 homes require, and are suitable for, loft insulation. This was from a sample of 17,500 homes in the Darlington LA area. It is expected that the authority will rollout a loft insulation programme up to 2020 and at least 1000 homes will be insulated.

##### 3. Solid wall insulation

From information included in the Darlington Private Sector Housing Condition Survey 2009 it was shown that 17,030 private sector dwellings have solid walls, representing 42.4% of all private sector dwellings. It is expected that a solid wall insulation programme will be rolled out up to 2020 and at least 500 dwellings will be insulated.

##### 4. Double glazing

From information included in the HEED report it was shown that 1707 homes require, and are suitable for, double glazing. This was from a sample of 17,500 homes in the Darlington LA area. It is expected that the authority will encourage residents to install new double glazing up to 2020 and that at least 1000 homes will install double glazing.

##### 5. Ground source heat pumps (GSHP)

From information included in the Council's Private Sector Housing Condition Survey it was shown that 2,340 homes are not on the mains gas network. This represents approximately half of the total housing stock. Indicatively GSHP are more likely to be installed in properties that are currently not on the gas network and using another form of solid fuel.

##### 6. Installation of Solar Thermal

Solar Thermal has not been developed or promoted by the Council to date - the local authority will endeavour to install solar thermal units in existing and new build social

housing. Through the emerging Local Development Framework the Council will encourage the installation of solar thermal in retrofit and new developments within the private sector.

7. Installation of Solar Photovoltaics (PV)

Solar PV has not been developed or promoted by the local authority to date - the local authority will endeavour to install solar photovoltaics units in existing and new build social housing. Through the emerging Local Development Framework, particularly the Design of New Development SPD, the Council will encourage the installation of solar PV in retrofit and new development within the private sector.

8. 10% domestic gas reduction from new boiler introduction and behaviour change

The current model does not currently take into account either boiler upgrades (from 60%-70% efficiency to 85% plus) or rising fuel costs. It is expected that the boiler upgrade intervention will provide a significant reduction in CO<sub>2</sub> from domestic gas consumption. Consequently, the 10% reduction suggested from behavioural change will include (for now) a proportion of savings from upgrading boilers and a small percentage of rising fuel costs. This will be revised accordingly when boiler improvements can be quantified.

9. 10% domestic electricity reduction through the introduction of EU products policy

The 10% reduction from behavioural change in electricity use is based upon the EU DIRECTIVE 2005/32/EC of 6 July 2005 that established a framework for the setting of ecodesign requirements for energy-using products. In total, the 12 products identified will save approximately 341TWh of electricity pa by 2020 (equivalent to 12% of electricity based on 2007 levels). The implementation of this directive commenced in December 2008 with the adoption of energy efficient stand-by mode (saving 35TWh pa) through to televisions in July 2009 (saving 43TWh pa). In addition, EU Directive 2009/125/EC of 21 October 2009 extended the scope of the 2005 directive to include all energy-related products (the use of which has an impact on energy consumption) and products which do not necessarily use energy, but have an impact on energy consumption.

It is therefore considered reasonable to allow for a 10% reduction in domestic electricity use based on the above policy.

### *Municipal Streetlighting*

Measures to improve the energy efficiency of the streetlighting stock are under consideration as part of the CMP process.

### *Industry*

1. 20% reduction of commercial gas use by the introduction of the Carbon Reduction Commitment (CRC), behavioural change and efficiency improvements

The CRC Energy Efficiency Scheme is one mechanism that the Government will use to meet the reduction targets set out in the Carbon Budgets Order 2009. This sets a reduction target of at least 34 percent in greenhouse gas emissions by 2020 based on 1990 levels - this would equate to an approximate 20% reduction by 2020 on 2005

levels. It is anticipated that the CRC cap will be set in line with the carbon budgets outlined above and this, combined with the amendments to the EU products policy, produces a realistic total gas reduction within the sector of 20%. Any interventions specified that would be included within this total reduction will be removed from the 20% total –this will include any municipal buildings projects.

2. 10% reduction of commercial electricity use by the introduction of CRC, EU products policy and behavioural change

The 10% reduction from behavioural change in electricity use is based upon the EU DIRECTIVE 2005/32/EC of 6 July 2005 that established a framework for the setting of ecodesign requirements for energy-using products. In total, the 12 products identified will save approximately 341TWh of electricity pa by 2020 (equivalent to 12% of electricity based on 2007 levels). The implementation of this directive commenced in December 2008 with the adoption of energy efficient stand-by mode (saving 35TWh pa) through to televisions in July 2009 (saving 43TWh pa). In addition, EU Directive 2009/125/EC of 21 October 2009 extended the scope of the 2005 directive to include all energy-related products (the use of which has an impact on energy consumption) and products which do not necessarily use energy, but have an impact on energy consumption.

In considering the above policy and the implementation of the CRC for large business, it is considered conservative to allow for a 10% reduction in electricity use within the commercial, industrial and public sectors. Any interventions specified that would be included within this total reduction will be removed from the 20% total –this will include any municipal buildings projects

## **Transport**

### *Municipal Fleet*

Measures have been included within the CMP to improve the fuel use of the Council's fleet vehicles. Measures include driver training and a rolling programme of vehicle replacement in line with EU policy.

### *Public Transport*

### *Private and Commercial Transport*

1. 4% reduction in fuel use from behavioural change

Local Motion achieved an 9% reduction in car driver trips. It is unclear as to whether this level of reduction could be sustained over the longer term, therefore a more conservative reduction of 4% is proposed.

2. Vehicle transport efficiency improvement

Tyne & Wear LTP Methodology - A study was carried out by Newcastle City Council to estimate the emissions from transport within Tyne and Wear in 2020. This indicative study utilised the traffic flows for all motor vehicles by each Local Authority area from 1993 – 2008 and the vehicle licence statistics for 2008. It further assumed that in a typical year 2.1 million new vehicles would be added to the national fleet and 1.9 million would be scrapped. This was done to modify the vehicle balance by assuming that over the next 13 years more low emission vehicles are bought and more of the higher emission vehicles are scrapped.

The results showed the average reduction in CO2 emission from vehicles in Tyne and Wear was around 12% (excluding any electric vehicle use).

3. Replace 10% of fuel with biofuel

The 10% bio-fuels reduction is based upon the EU DIRECTIVE 2009/28/EC of 23 April 2009, the promotion of the use of energy from renewable sources. This sets mandatory national targets for a 20 % share of overall energy supply to be from renewable sources and a 10 % share of energy used for transport to be from renewable sources by 2020.

4. Electric vehicle fuel displacement

One North East has carried out a study (based upon a Cenex/Arup 2008 study) to forecast the EV (Electric Vehicles) and HEV (Hybrid Electric Vehicles) ownership within the North East region by 2020. This study includes a Business as Usual (BAU) (1%), Mid-Range (3%), High-Range (6%) and Extreme Range (12%) scenarios as a percentage of total vehicle numbers.

The region has an aspiration to have 10% of vehicles as either EV's or HEV's by 2020, which is between the High-Range and Extreme-Range scenarios. The Council is installing up to 8 electric charging points in 2010/11 as part of the North East region's Plugged in Places project to support the introduction of electric vehicles.

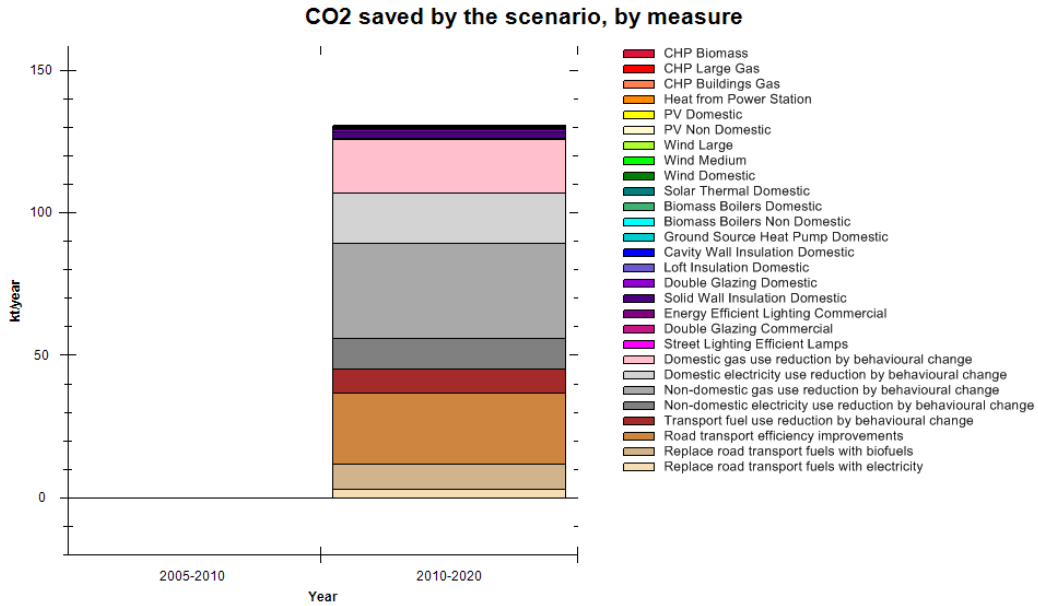


Figure 2 – carbon savings per measure

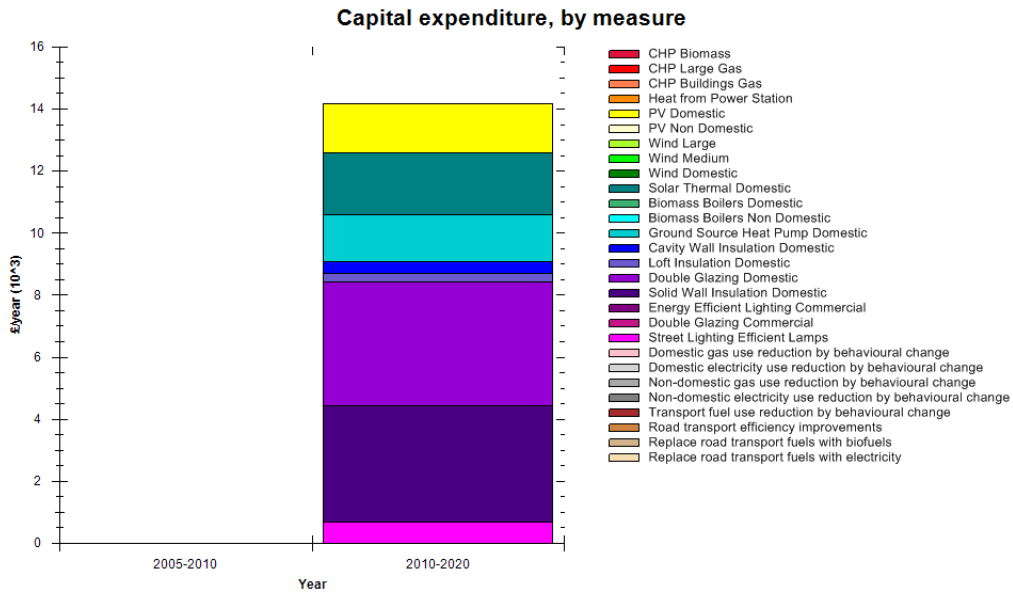


Figure 3 – Capital expenditure per measure

Figure 2 shows the carbon savings per measure (as included in Vantage Point and appended in Appendix 1). Figure 3 shows the capital expenditure per measure (figures generated by Vantage Point).

It is difficult to attribute actual carbon savings to the measures outlined in the paragraphs below, but each of the actions will contribute to and support the reductions accounted for within Vantage Point in the last section.

## **Land Use Planning**

### *Strategic Planning*

The Core Strategy and other LDF documents, once adopted will outline the most sustainable locations for development over the next 15 years, and will help to ensure that the design and location of new development will minimise carbon emissions arising out of the development itself and from the ongoing use/occupation of the development. It will do this by, for example, requiring at least 20% of energy supply in new strategic development locations to be provided through on-site provision of decentralised and renewable or low carbon sources of energy, and at least 10% of the energy supply in other major developments. It will also provide a framework for encouraging, in appropriate locations, commercial scale renewable energy developments, such as combined heat and power, district heating/cooling schemes and wind energy.

### *Transport*

Local Transport Plan 3 (LTP3) is currently under development and will encourage the delivery of measures that contribute to a reduction of carbon emissions from transport.

### *Standards for refurbishment and new development*

The emerging Core Strategy and other LDF documents will promote high standards of sustainability on existing and new developments and encourage renewable and sustainable energy solutions.

## **Public Procurement of Products and Services**

### *Energy Efficiency requirements/standards*

Measures to embed carbon management within the Council, including its procurement processes, are included within the CMP

### *Renewable Energy requirements/standards*

Measures to embed carbon management within the Council, including its procurement processes, are included within the Council's CMP.

## **Working with citizens and stakeholders**

The Council and its partners will continue to provide Advisory Services, Financial support and grants and undertake a programme of awareness raising, training and education and local networking to support the delivery of the SEAP.

## Progress against the target

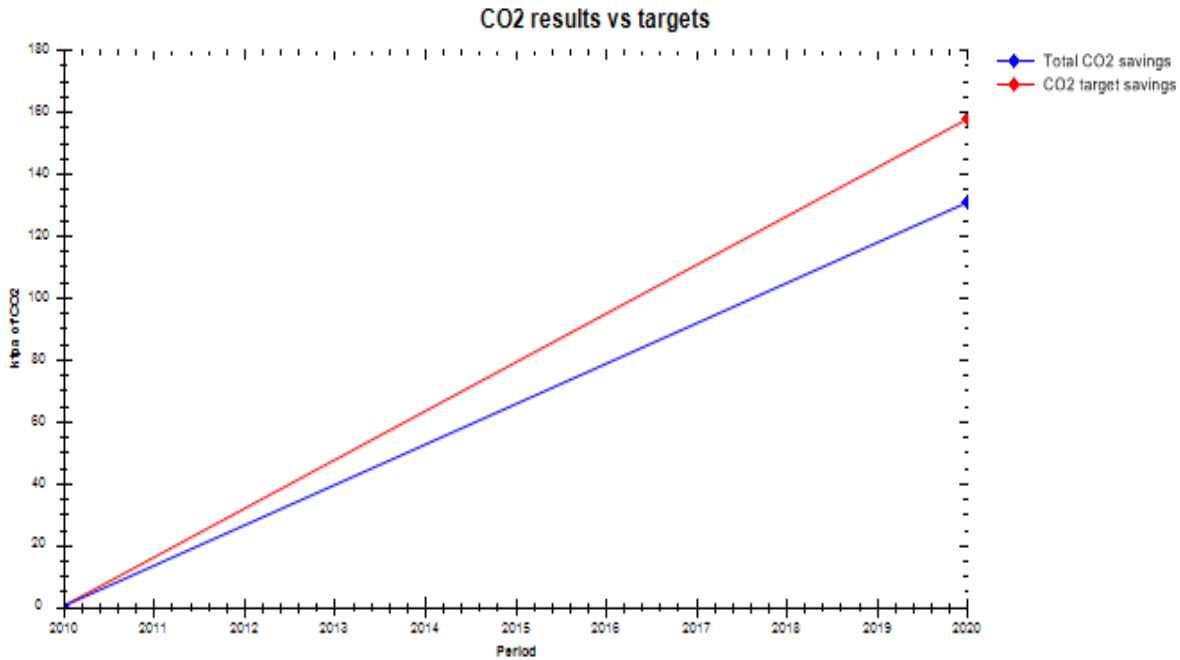


Figure 4 – Carbon reduction over time

Figure 4 shows that by implementing the minimum measures outlined above, CO<sub>2</sub> savings of 133,500 tonnes would be achieved. This falls short of the required 157,350 tonnes by 23,850 tonnes. However, the SEAP also includes savings from decarbonisation of the grid (see below), which equate to 30,000 tonnes of CO<sub>2</sub>. Therefore by implementing the minimum measures outlined above the target of 20% reduction in carbon emissions by 2020 can be achieved.

### Other sectors

#### 1. Decarbonisation of the grid

The national government has a target of produce around 30% of grid electricity from renewables by 2020 by substantially increasing the requirement for electricity suppliers to sell renewable electricity. If a conservative approach is taken and the carbon intensity reduction of the grid reached half the anticipated amount by 2020 then the estimated savings would be in the region of 30 ktpa and this would mean Darlington BC would exceed the 20% target.

## ***Monitoring progress***

Every 2 years, following the submission of the SEAP, the Council is required to submit an implementation report to show results achieved to date in terms of measures implemented and CO2 emission reductions. As the Council signed up to the Covenant of Mayors in February 2009, the first implementation report will be required to be submitted in February 2012.

Data produced centrally for NI186 will be used to report progress against the SEAP. Monitoring of the SEAP will be integrated within the monitoring of the Darlington Climate Change Action Plan.