



**Low carbon Lincoln Plan**

**2012 – 2020**

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## Summary of the Low Carbon Lincoln Plan

**Low Carbon Lincoln Aims** – To establish a Low Carbon Lincoln partnership (LCLP) working together to prepare a Low Carbon Lincoln plan to reduce Lincoln’s carbon footprint. The LCLP aims to involve all sectors of the community in reducing carbon dioxide (CO<sub>2</sub>) emissions in Lincoln; prepare the city for the impacts of climate change and support opportunities for the local economy and community that result from climate change.

### Background

On the 14<sup>th</sup> March 2012 the City of Lincoln Council hosted Lincoln’s first low carbon conference, 115 people attended the conference from 45 different organisations and businesses across the city. Communication between organisations prior, during and post the conference has confirmed that there is a need for a low carbon partnership to share ideas, information and work together on issues of mutual interest to reduce Lincoln’s carbon footprint. Delegates confirmed their agreement to forming a partnership and joint working by signing up to a low carbon Lincoln charter. As part of the conference we held a number of workshops and asked delegates to discuss potential actions for joint working, ideas and suggestions which we have included in this report.

### Objectives of the Low Carbon Lincoln Plan

The plan captures the ideas, projects and initiatives discussed at the conference and starts to identify opportunities for joint working to deliver some of the ambitions raised at the conference. The plan outlines potential projects, an approach to monitoring carbon dioxide emissions and proposes a target based on potential for CO<sub>2</sub> reductions by 2020. The plan will be updated on an annual basis to include new carbon reduction schemes.

### Greenhouse gas emission reduction targets

Amongst the LCL partners there has been considerable discussion between organisations on the need to establish a target for Lincoln.

The following approach to establishing targets has been suggested for Lincoln:

- A minimum target to reduce CO<sub>2</sub> emissions per head of population by 25% by 2020 based on a 2005 baseline.
- A **long term** target to reduce Lincoln’s CO<sub>2</sub> emissions by 80% by 2050 based on a 2005 baseline

In order to establish an aspirational target for 2020 it has been necessary to collate the various CO<sub>2</sub> emissions data collected by individual organisations as well as identify future local and national initiatives that will have an impact on Lincoln’s CO<sub>2</sub> emissions by 2020. See section 4 for the breakdown of projects likely to influence Lincoln’s CO<sub>2</sub>.

The target agreed by the LCL partnership does not reflect national target of 34% reduction of CO<sub>2</sub> emissions by 2020. The CoLC are preparing a Low Carbon Lincoln Strategy to identify potential for meeting the 34% as part of ongoing development and regeneration of the city.

Working towards these targets will require a reduction in emissions from all sectors of the community. To understand where and how CO<sub>2</sub> savings can be made from particular areas we need to identify potential savings from the following sectors:

### Potential savings by sector

Sector	2005 Baseline CO <sub>2</sub> emissions (t)	Est CO <sub>2</sub> emissions (t) 2020	Percentage reduction	Actions to achieve emissions savings
Domestic	207 000	165 600 (2011 fig.167 300)	Propose 20%	Home insulation programmes, behaviour change, reduction in carbon intensity of grid electricity, micro renewables on homes
Industrial and commercial	278 000	194 600 (2011 fig.205 500)	Propose 30%	CRC energy efficiency scheme, reduction in carbon intensity of grid electricity, behaviour change (SAGE scheme)
Transport	66 000	56 100 (2011 fig. 62 000)	Propose 15%	Improvements in vehicle efficiency, increase in electric vehicles and biofuels, increase in public transport, increase in the numbers of people walking and cycling
LULUCF	2000	2000	0	
<b>TOTAL CO<sub>2</sub> emissions</b>	<b>553 000</b> <b>6.3 t per capita</b>	<b>416 300</b> <b>4.7 per capita</b>	<b>25%</b>	

Lincoln's CO<sub>2</sub> emissions data are taken from the National Indicator 186 (per capita emissions in the Local Authority area) data set <https://www.gov.uk/government/publications/local-authority-emissions-estimates>

LULUCF Land Use, Land-Use Change and Forestry

## **Adaptation**

The impacts of climate change will be felt in Lincoln even if we being to reduce greenhouse gas emissions significantly. Lincolnshire's first local climate impact profile was first produced in May 2009 and a risk assessment in 2010 to identify local impacts, financial cost and potential steps that need to be in place to reduce risk. The Environment Agency has taken on a new role as the Climate Ready Support Service to help organisations adapt to climate change. This role will build on the work of the UK Climate Impacts Programme (UKCIP). The Environment Agency provide a support service to help businesses, public sector and other organisations in adapting to a changing climate. Visit the [Environment Agency's web pages](#) for the current information sources and tools which are available to help you now.

The next step is for key organisations to work together to produce an action plan for Lincoln to identify how climate related disruption is kept to a minimum.

## **Section 1 Aims and Objectives of the Low Carbon Lincoln partnership**

This report identifies a proposed approach for the LCL partnership to work together to tackle climate change and monitor greenhouse gas reduction progress on an annual basis. In 2008, the UK Government passed the first Climate Change Act into law and become the first national Government to commit to legally binding CO2 reduction targets.

Action has continued to progress in the East Midlands as a region. All Local Authorities in the East Midlands signed the Nottingham Declaration in 2007, completed a climate change risk assessment and local carbon impacts profile report. The City Of Lincoln Council and Lincolnshire County Council signed up to Climate Local in 2012. Climate Local succeeds the Nottingham Declaration on Climate Change and offers a framework that can reflect local priorities and opportunities for action.

The LCLP includes a wide range of public, private and third sector organisations as well as and community groups. The aims and objectives of the LCLP are outlined below:

### **Aims**

- Reducing our carbon footprint across all of our sites and operations in Lincoln.
- Creating a low carbon, sustainable economy in Lincoln which will be an example to cities across the country.
- Creating more green jobs, increasing prosperity and opportunity for all.
- Supporting a programme of best practice and sustainable innovations
- Reporting each year on the progress we are making

### **Objectives**

- Work together to create a low-carbon, sustainable Lincoln
- Work together to build a prosperous city for high technology, smart services and the other elements of a sustainable, local economy in which all can share.
- Make Lincoln a leading city for reducing carbon emissions and tackling climate change
- Champion local people who are trying to reduce their carbon footprint

## Section 2 Achievements to date

### Local Context

Between 2005 – 2013 CO<sub>2</sub> per capita emissions have reduced in Lincoln by 17%, this percentage figure is divided by the following sectors:-

- Domestic 16%
- Industrial and commercial 17%
- Transport 10.5%

### How we can continue to monitor progress?

To monitor progress on an annual basis, CO<sub>2</sub> savings and increases can be estimated for projects undertaken by the LCLP. Any project that produces measurable energy savings such as home insulation or reduction of vehicle emissions can provide an estimated carbon saving. In addition organisations own carbon reduction targets can be taken into account to enable us to establish an aspirations CO<sub>2</sub> target for Lincoln. The following table identifies targets of individual organisations based in Lincoln.

Organisation/Business	Target
City Of Lincoln Council	40% by 2020 (actual reduction 28% since 2008)
University of Lincoln	43% by 2020/2021
Siemens	1.7 % pa
United Lincolnshire Hospitals NHS Trust	30% by 2015
Lincolnshire Partnership NHS Foundation Trust	10% saving in CO <sub>2</sub> by 2015
Lincolnshire County Council	Carbon Management Plan 2013-18, establishes a 2011-12 baseline for emissions and sets a target to reduce them by 22% by 2018.
Environment Agency	33 percent by 2015 based on 2006/07 levels,
Stagecoach	8% in buildings CO <sub>2</sub> e emissions and a cut of 3% in annual fleet transport CO <sub>2</sub> e emissions by 2013-14
Simons Group	20% target by 2020. (22% reduced since 2008)

## Section 3 National and International focus

### National focus

Since 2004, action to tackle climate change in the UK has continued to gather pace.

Increasing support at a national level for communities to take the lead in tackling climate change is hugely important. Below is a summary of key events:

- The Stern Report, published in 2006, outlined how without immediate attention, the actions that will be essential later to tackle climate change will be much more costly.
- In December 2008, The Climate Change Act became law in the UK. This commits the Government to a legally binding CO<sub>2</sub> reduction of at least a 34% by 2020 and an 80% by 2050 based on a 1990 baseline.
- Local Authorities voluntarily report CO<sub>2</sub> emissions from council operations, as well as demonstrating climate change adaptation plans for their area of jurisdiction.
- Currently any organisation that consumed over 6,000 megawatt-hours (MWh) of qualifying electricity through settled half-hourly meters have to comply legally with the the CRC (Carbon Reduction Commitment) scheme. This is designed to gradually lower CO<sub>2</sub> emissions from organisations across the UK.
- The UK Climate Impacts Programme provides increasingly detailed advice on the likely impacts of climate changes in towns and regions across the UK. The headlines for the East Midlands include: an increase in summer mean temperatures in 2050 by up to 2.9°C, and an increase in average winter rainfall of around 11%.

### Potential future impacts on LCL within 5 years:

**International agreements to tackle climate change** – Although no legally binding global commitment to tackle climate change emerged from the 2009 climate change conference in Copenhagen, it is still likely that some form of international action will be agreed within the next 5 years. This may impact on the UK's CO<sub>2</sub> emission targets.

**Review of the Climate Change Act** – Agreement at International level on greenhouse gas emission targets could result in a change to the UK's Climate Change Act through the setting of more ambitious targets.

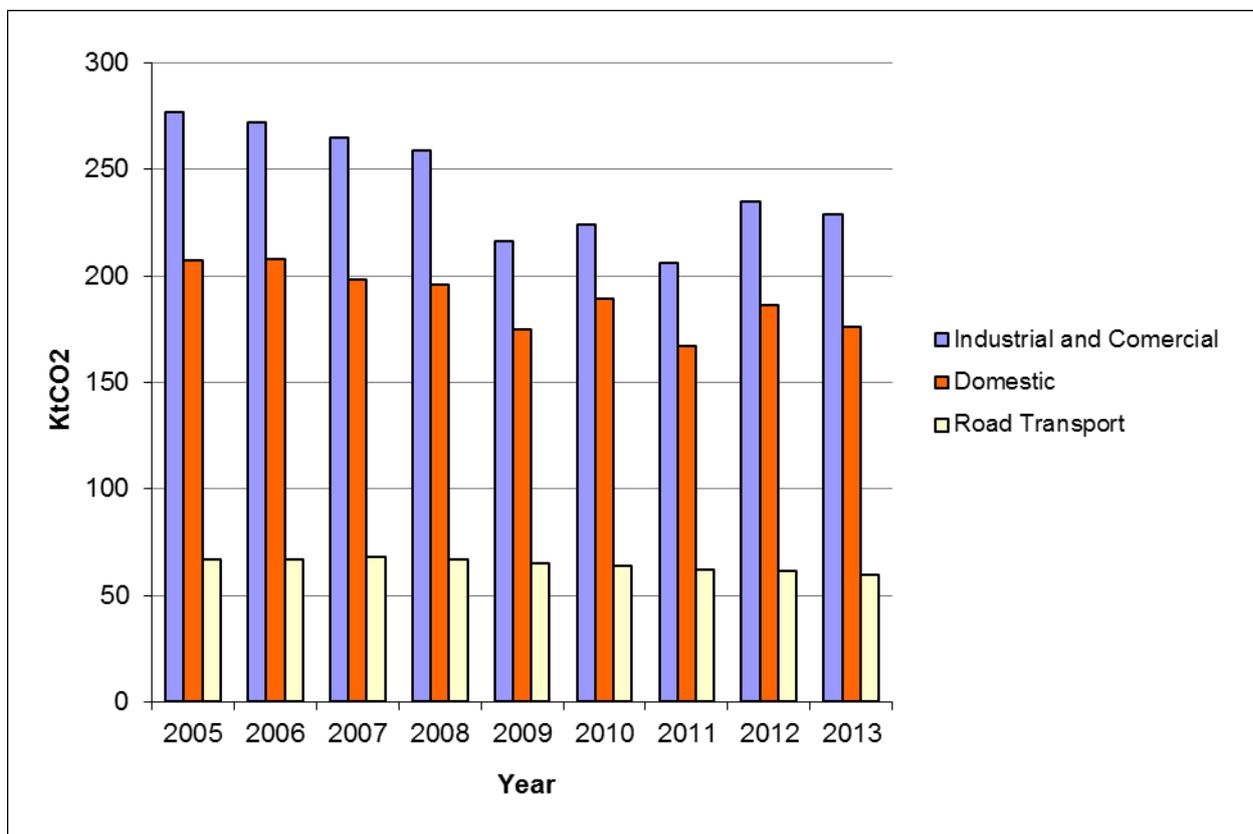
**Local Carbon Frameworks** – Developed following a pilot in 2010 run by Department for Energy and Climate Change with nine local authorities to identify various approaches to introduce carbon

reduction measures across local authority areas. The outcome of the pilot was to develop templates for action on carbon by all local authorities. The new council frameworks on climate change were introduced in November 2011 and provide a self regulation action on carbon reduction and will be overseen by 'climate local.'

## Section 4 CO<sub>2</sub> target 2012 – 2020

Setting a target to reduce emissions is the easy part. Identifying where and how carbon dioxide will be saved is hard, particularly when attempting to forecast savings to 2020 and 2050. LCLP could use [carbon modelling software](#), such as Vantage Point, to create a scenario and help work out what measures will need to be put in place to reduce emissions. Currently we rely on data provided by the Department of Energy and Climate Change which has a 2 year time lag, shown in the table below.

### Lincoln's CO<sub>2</sub> emissions from 2005 – 2013



Based on individual organisations' carbon reduction targets and proposed emissions savings from carbon management plans it is possible to establish potential emission reduction savings from different sectors. This needs to include actions on a local scale as well as anticipating changes on a national level, such as the switch to 30% of our electricity coming from renewable energy sources (Government Renewable Energy Strategy). This represents just one scenario for meeting an agreed 2020 carbon emissions reduction target. Further explanation of how a 25% CO<sub>2</sub> reduction target, identified in summary to this report, could be met is outlined as follows:-

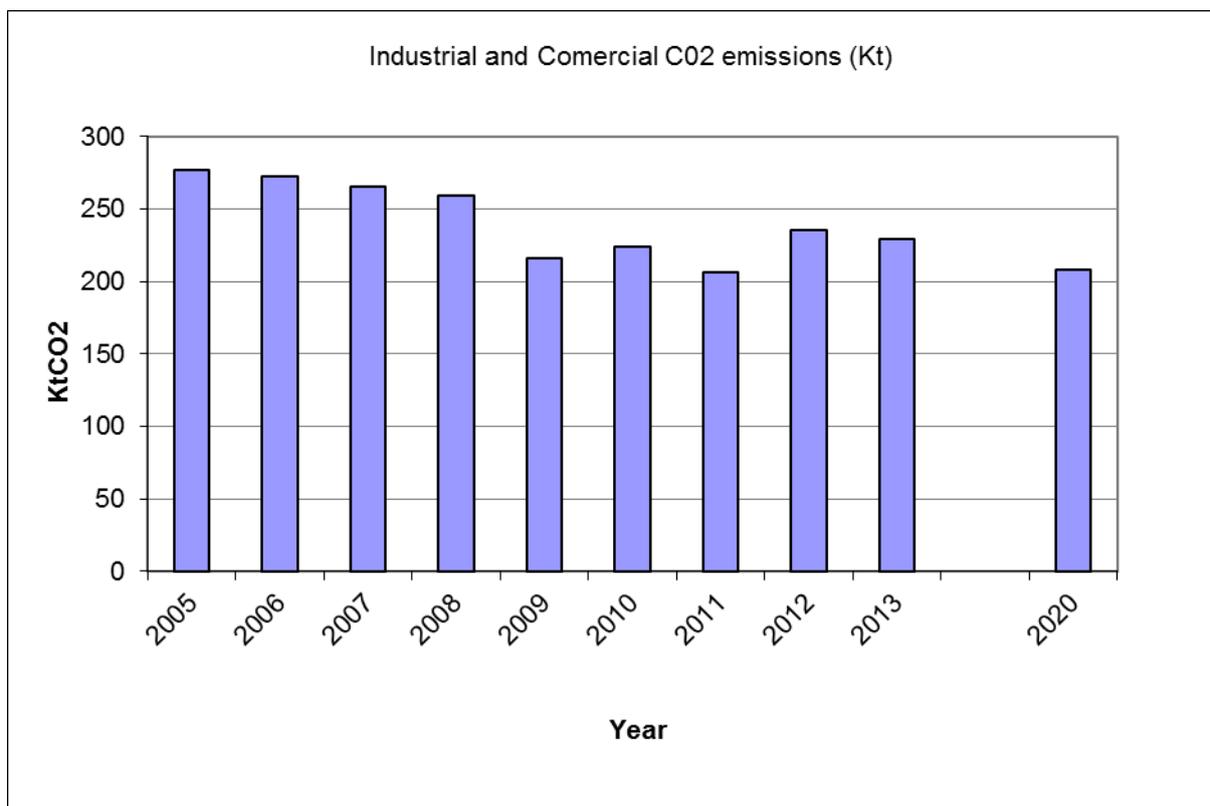
## Industrial and commercial energy use

This section covers the CO<sub>2</sub> emissions arising from Lincoln's industry and commercial sector as defined by [National Indicator 186](#). This indicator is no longer collected by national Government but the definition is still used to provide comparable data with other local authorities.

The total emissions from the industry and commercial sector decreased by 17% from 2005 to 2013. It is likely that this decrease came about due to the rising energy prices incentivising investment in energy efficiency measures, the increasing number of large organisations with a carbon management plan and their CO<sub>2</sub> targets. Energy use from the industry and commercial sector represents 49% of Lincoln's emissions in 2013. Due to issues around confidentiality it will not be possible to identify which organisations are the most intensive energy users. However due to the collaborative work agreed by the LCLP we will be able to breakdown emissions further within this sector to large scale industrial, small scale industrial, Education, NHS, City and County Council. We will also be able to establish the anticipated CO<sub>2</sub> reduction to be achieved by 2020 within each sector based on individual organisations targets.

Projects under this theme will focus on energy efficiency as well as any projects related to the installation of renewable or clean energy.

**Graph 3 Industry and commercial carbon dioxide emissions in Lincoln forecasted to 2020 (based on a 30% target).**



The graph shows a fluctuation in CO<sub>2</sub> emissions in this sector since 2010, however overall there has been an overall 17% decrease. This sector has achieved the largest carbon reduction results in Lincoln.

The following table identifies potential projects, identified during and post the LCL conference and provide an estimation of CO<sub>2</sub> emission reduction by 2020 to support the 30% target for the industrial and commercial sector and an overall target of 25% for Lincoln.

Carbon reductions schemes	Explanation of measure/assumptions	Delivery	Estimated annual CO <sub>2</sub> increase/saving (tonnes)
All organisations affected by the CRC to adopt aspirational CO <sub>2</sub> targets.	The CRC (Carbon Reduction Commitment energy efficiency scheme) affects all organisations with an energy use of at least 6,000MWh per year.	All organisations that are affected by the CRC i.e. NHS, Lincolnshire County Council, University of Lincoln  Also large companies, i.e. Siemens, 1.3% reduction target pa	41 700 (based on a combination of individual organisations targets)
Increase membership and activities in Lincoln of Sustain Lincolnshire	Sustain Lincs promotes energy saving in Small and Medium sized Enterprises (SMEs) in Lincoln.	Sustain Lincolnshire, CoLC Economic Development Team, chamber of commerce,	2780  (based on 1% of ind/com baseline)
Energy efficiency loans for schools, hospitals, university and other public sector buildings.	Salix scheme offers interest free loans, significant reductions in CO <sub>2</sub> have already been achieved as part of the scheme in Lincoln.	All public sector organisations	Tbc  (CoLC achieved 5% reduction between 2009/10 – 2010/11)
Introduction of new renewables to grid electricity	The Government aims to see 30% of renewable contribution in the electricity generation market by 2020 and 12% renewable contribution from heat generation.  nb There is a significant risk around the implementation of large scale renewables and nuclear power by 2020.  Central Lincolnshire energy	Government, Energy suppliers.  All 3 central Lincolnshire planning authorities,	78 722 t CO <sub>2</sub>  (Assumes 30% UK's electricity and 12% heat generated by renewable technologies by 2020 – based on 2011

	<p>study identifies suitable locations for potential Renewable energy and district heating schemes and potential carbon reduction. Includes energy from waste plant at Teal park (located just outside Lincoln)</p> <p>Based on the energy study Central Lincolnshire Core strategy adopted in 2013 has set a 60% target for electricity and 12% for heat generated within central Lincs from renewable sources.</p>	<p>developers, renewable energy companies.</p>	<p>total emissions)</p>
<p>Combined Heat &amp; Power</p>	<p>This measure anticipates the introduction of new combined heat and gas systems for commercial &amp; industrial buildings.</p>		<p>22 605 t CO<sub>2</sub> (based on 11% predicted by 2020 for industrial and commercial)</p>
<p><b>TOTAL estimated savings</b></p>			<p>145 807 t CO<sub>2</sub></p>

Based on the projects identified in the table above there is potential for 70% CO<sub>2</sub> reduction in the industrial and commercial sector could be achieved by 2020, so far these projects have contributed towards the 17% CO<sub>2</sub> reduction already achieved between 2005 -2013. Therefore it is reasonable to assume that a 30% target for this sector by 2020 (based on 2005 baseline) is achievable.

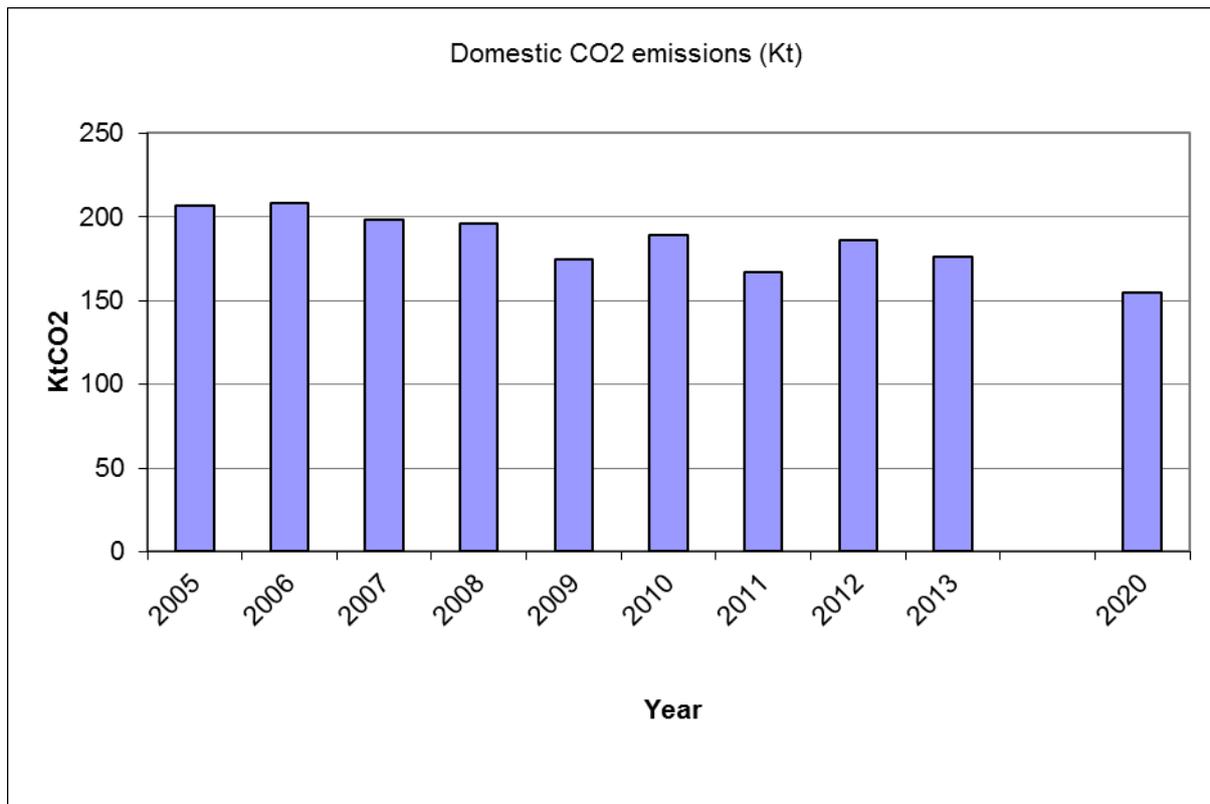
- **Domestic energy.**

This section covers the energy use from households across Lincoln. Electricity and gas use in the home accounted for 38% of all Lincoln's emissions in 2013. However the work of the Home Energy Lincolnshire Partnership (HELP) contributed to a reduction in Lincoln of 15% in domestic emissions between 2005-2013.

The most significant carbon saving measures are associated with improving the energy efficiency of Lincoln's council housing stock. The move to greener forms of energy production such as wind and solar power will continue to lower the carbon footprint of housing stock. In 2012 five new low energy council homes were built and a further five council homes will be built in 2014. It is predicted that the demand for energy in homes will fall due to the increasing costs of gas and electricity increasing the incentive to improve the energy efficiency of homes. Further

improvements to the domestic emissions could be achieved as a result of the Government’s £1000 grant scheme for all home buyers towards home insulation and boiler improvements, this will extend the current Green Deal Cashback scheme available to all homes. The green deal was introduced in 2013, however there has currently been a low take up of this finance scheme. increased availability of energy savings products and schemes such as solid wall insulation. It is expected that there will be a separate scheme to incentivise energy efficiency improvements to rented homes, which will have a significant impact due to the number of poor quality older housing stock in Lincoln. From 2018 it will be illegal to rent out properties with the lowest energy efficiency rating.

**Graph 2 Domestic carbon dioxide emissions in Lincoln forecasted to 2020 (based on a 20% target)**



The graph shows a fluctuation in CO<sub>2</sub> in the domestic sector since 2010, however overall there has been a reduction of 15% since 2005.

The following table identifies potential projects, identified during and post the LCL conference and provide an estimation of CO<sub>2</sub> emission reduction by 2020 to support the 20% target for the domestic sector and an overall target of 25% for Lincoln.

Carbon reductions schemes	Explanation of measure/assumptions	Delivery	Estimated annual CO <sub>2</sub> increase/saving (tonnes)
Cavity Wall insulation for homes that are	No of houses already insulated data from Home Energy	CoLC and HELP have data	2070 t CO <sub>2</sub>

suitable	<p>Lincolnshire Partnership (HELP)/warmfront etc.</p> <p>Data for properties from recent stock condition survey to establish no. of suitable homes</p> <p>Data monitoring software for Lincolnshire SAP 2009 enable houses without insulation to be targeted.</p>	HELP looking into how Green Deal will be delivered within Lincolnshire	(1% of baseline)
Loft insulation for homes	As above	As above	<p>2070 t CO<sub>2</sub></p> <p>(1% of domestic baseline)</p>
All new housing is to be built to Sustainable Homes level 4 to 2016, and level 6 (zero carbon) from 2016 onwards. This is a Government requirement.	<p>Based on the Government's 'Code for Sustainable Homes' that was launched in 2006.</p> <p>5 new council houses to be completed in Dec 2012 will be code level 4</p> <p>Incorporate planning policies which will ensure that new development in Lincoln contributes to a reduction in CO<sub>2</sub> emissions through the Local Development framework.</p> <p>The Core Strategy of the LDF is due for adoption in 2013.</p> <p>Consider decentralised energy ie CHP for new mixed use developments</p> <p>Consider decentralised gas CHP to be capable of providing to existing housing stock</p>	<p>Central Lincs JPU, CoLC planning, housing developers</p> <p>CoLC</p> <p>JPU, CoLC</p> <p>JPU, Central Lincolnshire Local planning authorities</p>	<p>Neutral (due to the increased number of houses)</p> <p>TBC</p>
Promote the adoption of energy saving	Introduce a series of training, skills share and workshops on	Transition Lincoln, Lincoln college,	<p>1036</p> <p>(0.5% of domestic)</p>

measures in the home.	<p>energy efficiency in the home through the greeniversity scheme.</p> <p>National roll out of smart meters by energy suppliers in 2014</p> <p>Allowable Solutions (to reach an agreement with developers to offset emissions of new housing by improving the SAP rating of existing houses.)</p>	<p>CoLC</p> <p>Government, Energy Suppliers</p> <p>JPU, Central Lincolnshire Local planning authorities</p>	<p>baseline)</p> <p>TBC</p>
Introduction of new renewable energy technologies to generate electricity distributed through the national grid.	<p>The Government aims to see 30% of the UK's domestic electricity generated by renewable or green electricity by 2020 (nb There is significant uncertainty around the implementation of large scale renewables and nuclear power by 2020.)</p> <p>Central Lincolnshire energy study identifies suitable locations for potential Renewable energy and district heating schemes and potential carbon reduction.</p>	Government, Energy suppliers.	26 250 (Assumes 15% UK's domestic electricity generated by renewable or green electricity by 2020)
Increase the uptake of micro renewables by households	<p>The Government's Household Energy Management Strategy; <i>Warm Homes, Greener Homes</i> aims to have 7 million homes equipped with eco upgrades that include the installation of renewable energy technology. The Feed in Tariffs (FITs) is included in this strategy.</p> <p>(NB reduced FIT likely to have impact on this target)</p>	Government, Energy suppliers.	1035  (Based on 1000 in Lincoln with eco upgrades by 2020)
Achieve a year on year improvement in energy efficiency of	8000 council houses, currently average SAP rating of 74	CoLC	Tbc on completion of

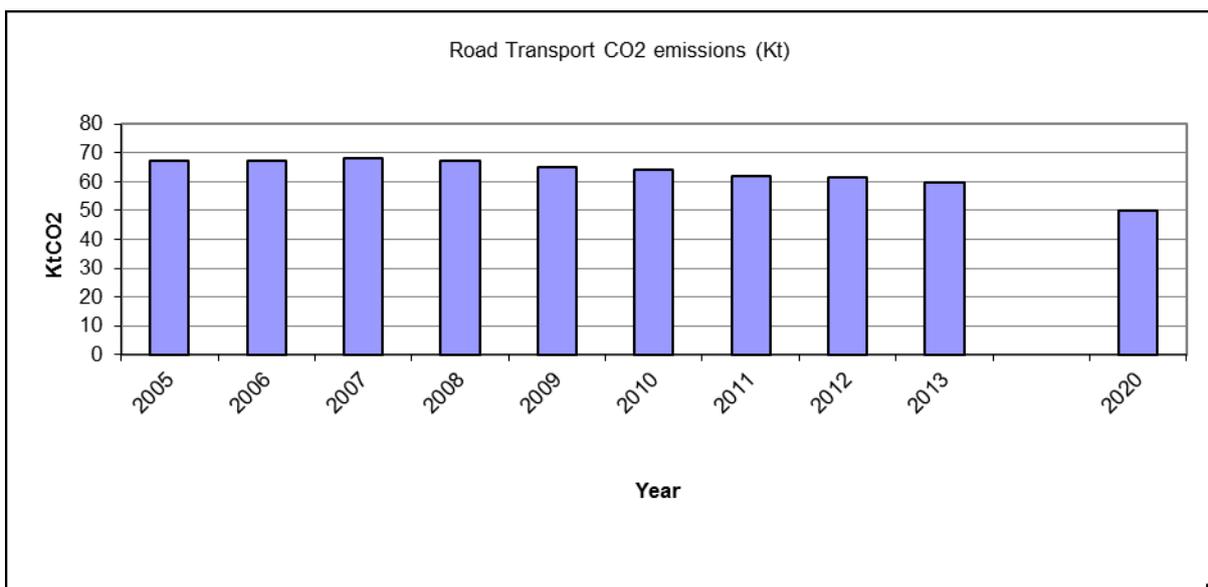
Council owned residential property	Housing energy strategy identify work completed and remaining improvements  Identify further potential for renewable technology ( first PVs installed in 2012)		strategy
<b>TOTAL increase/savings</b>			30 211
	Highlights national schemes with a local impact on emissions.		

Based on the projects identified in the table above a further 15% CO2 reduction in the domestic sector could be achieved by 2020, projects have so far contributed to the 15% reduction already achieved between 2005 -2013. Therefore it is reasonable to assume that a 20% target for this sector by 2020 (based on 2005 baseline) is achievable.

- **Transport**

Emissions from transport across Lincoln decreased by 10.5% between 2005 to 2013. These savings can be attributed to the increased efficiency of vehicles, and not a reduction in vehicle use as the number of Kilometres driven has increased year on year. By 2020, the increased efficiency in vehicles is expected to contribute to a 15% reduction in transport CO<sub>2</sub> emissions based on 2005 figures. Access LN6 programme started in 2013 and resulted in a reduction of vehicle mileage in Lincoln, as a result this will have reduced emission between 2013 and 2015.

**Graph 4 Transport carbon dioxide emissions in Lincoln forecasted to 2020 (based on a 15% target).**



The following table identifies potential projects and provide an estimation of CO<sub>2</sub> emission reduction by 2020 to support the 15% target for the transport sector and an overall target of 25% for Lincoln.

Carbon reductions schemes	Explanation of measure/assumptions	Delivery	Estimated annual CO <sub>2</sub> increase/saving (tonnes)
Improvements in vehicle efficiency	Although private journeys continue to increase, efficiency improvements is anticipated to reduce emissions from vehicles by 13% by 2020 compared to 2005.	Department of Transport, car manufacturers	8500 (based on 13% of transport baseline)
Access LN6	Project to reduce traffic congestion and increase cycle, pedestrian and public transport usage in the LN6 are the Lincoln. 2013-2015	LCC, CoLC, Highways, Stagecoach, Sustrans,	16 425
Access Lincoln	Extension of Access LN6 project to reduce traffic congestion and increase cycle, pedestrian and public transport usage in the whole of Lincoln. 2016 - 2019	LCC, CoLC, Highways, Stagecoach, Sustrans,	17, 850 (3 % reduction based on 2013 figs)
Promoting the use of low carbon vehicles	Discount on car parking and residential parking permits for low emission vehicles using city council car parks	CoLC	Already accounted for above
Promotion of travel plans for businesses and organisations in Lincoln.	Travel plans encourage more people to use public transport and alternatives to the car.  Awareness raising events for bike to work week etc  Sustrans/LCC cycle officer support for businesses	LCC, CoLC, individual organisations/companies  LCC, Sustrans, CoLC	650 (based on 1% of transport baseline)
Proportion of road transport fuels replaced by increase in electric vehicle	Includes the establishment of electric car charging points in Lincoln  Cenex 60% grant for LAs and	CoLC, LCC, Department of Transport, car manufacturers	1950 (Based on a national study into electric vehicle potential, the percentage of fuel displaced by electric vehicles is assumed to be 3%.)

use.	40% grant for business		
Smarter and greener driving	Promoted through employers and the Energy Saving Trust. Potential for a 5% improvement in driver efficiency.	LCC, CoLC, Lincoln Employers	3250 (based on 5% of transport baseline)
Traditional road transport fuels replaced with biofuels	Based on EU biofuels policy, it is estimated that 10% of fuel used in 2020 will come from biofuels. Biobuses emit up to 40% less CO2	Government/ Department of Transport	Already accounted for
Increase in public transport use	Promotion of Big Bus deal (employee reduced cost travel scheme) for businesses in the Lincoln BIG area.  Improvements to Bus station as part of the city centre master plan	Stagecoach, Lincoln BIG, individual organisations	Already accounted for
Improvement to cycle lanes and safe storage	Improvements to cycle access planned as part of the LN6 sustainable transport bid  Improved cycle facilities and storage in city centre as part of the city centre master plan  Review facilities for cyclists in CoLC car parking strategy 2012/13	LCC, CoLC, Sustrans  CoLC, Lincoln BIG  CoLC	Already accounted for
Transport synergy	A link commercial and city transport scheme	Siemens, LCC, CoLC	TBC
<b>TOTAL estimated savings</b>			48 625 tCO <sub>2</sub>

Nation and EU data supplied from

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/3085/41.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3085/41.pdf)

Based on the projects identified in the table above a further 28% CO<sub>2</sub> reduction in the transport sector could be achieved by 2020, 10.5% of this has already achieved between 2005 -2013.

Therefore it is reasonable to assume that a 15% target for this sector by 2020 (based on 2005 baseline) is achievable.

- **Education and communication**

Delivering real progress in tackling climate change requires the support of the people who live and work in Lincoln. Individuals' perceptions of, and beliefs about, climate change are affected by direct experience as well as the social, cultural and political context.<sup>1</sup> Polls seeking public opinion vary widely depending on the way the questions are asked. Therefore it is necessary to ensure the public are provided clear messages about climate change to ensure individuals are able to make well informed decisions to reduce their carbon footprints.

Lincolnshire County Council and the City Of Lincoln Council have supported a range of educational projects such as the Eco Schools award scheme, to encourage a better understanding of climate change. Since 2007 the transition Lincoln group have been involved in a range of awareness raising initiatives, training and research regarding awareness raising and practical support to help people reduce their own carbon footprint. Membership of the group is growing with over 300 local residents on the mailing list and interest in the group is continuing to grow.

Communicating the need to tackle climate change will remain a priority, and importantly, its significance in delivery reductions in CO<sub>2</sub> will not be overlooked. For example, the scenario for reaching a 25% reduction in CO<sub>2</sub> emissions by 2020 relies on a 10% reduction in electricity and gas use. Changing attitudes to the way electricity and gas are used will be important in contributing to this target.

Aspirational Goal	Explanation of measure	Who can deliver the actions?	Estimated CO <sub>2</sub> savings or measure of success
Achieve 10% reduction in energy use by 2020 through behaviour change	Rising gas and electricity cost along with a change in attitudes to energy should encourage behaviour change with regard to energy use.  Ongoing support to lift more people out of fuel poverty (currently 1 in 4 in Lincolnshire)	LCC, HELP, COLC	Already accounted for in domestic CO <sub>2</sub> total.
Promote the concept of low carbon Lincoln in Lincoln	Through delivering a programme of courses, workshops etc as part of the Greeniversity scheme and carbon conversations	Transition Lincoln, University of Lincoln CoLC	NA
All schools in Lincoln to follow the	The national Sustainable Schools programme, Eco Schools programme	LCC Sustainable Schools Group, CoLC	Already accounted for in Ind/Com CO <sub>2</sub> total as

<sup>1</sup> <http://www.nature.com/nclimate/focus/views-about-change/index.html>

Government's Sustainable School scheme.	and Climate Change Lead Schools Programme, will play a key role in encouraging schools to integrate climate change into their everyday activities. A significant proportion of LCC's total CO <sub>2</sub> emissions are from school buildings.		LCC comes under CRC.
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## Section 5 Climate Change Adaptation

Following the conference we are proposing that a Climate Change Adaptation Action Plan for Lincoln is produced, led by the City and County councils and involving the LCLP. The Action Plan would look at the projected climate conditions for 2050 and consider the likely impacts of the changing climate on the city. The UK climate projections (UKCP09) provide information on how the UK's climate is likely to change in the 21<sup>st</sup> century, as it responds to rising levels of greenhouse gas in the atmosphere. In general terms the projections for Lincoln are:

- Warmer and wetter winters
- Hotter and drier summers but with more extreme weather events such as experienced in spring/summer 2012

By assessing the city's vulnerabilities, the aim is to use this information to guide the work of Lincolnshire County Council, the City of Lincoln Council and partner organisations over the next 40 years. Building climate change adaptation considerations into this work will help the city incorporate appropriate adaptations into routine maintenance work and capital projects. Not only will this help the community to cope with the negative impacts of climate change, but it will also put the city in an excellent position to grasp the numerous business opportunities that will arise.

The adaptation action plan will contain existing initiatives. In some areas, such as flood risk management, a great deal of work has already been undertaken. In other areas such as engaging in adaptation based business opportunities, there is much to be done to raise the profile across the business community.

### Selected key issues to be included in the Climate Change Adaptation Action Plan

- The EA are looking at current and future flood risk to people, property, infrastructure and agricultural land and the options for managing it in the Upper Witham Flood Risk Management Strategy. Its findings will form the basis of how to manage flood risk in the future within the Upper Witham catchment and will build on work already carried out in the area.
- Water management in terms of an increased demand on consumption and treatment.

- Cancer Research UK promotes a SunSmart campaign to raise awareness of the risks associated with exposure to ultraviolet radiation.
- In 2010 Lincolnshire County Council established the Flood Risk and Drainage Management Framework to facilitate effective coordination between local partners to deliver the local Flood Management Plan
- Central Lincolnshire JPU produced a green infrastructure study in 2011 to underpin and support development of spatial planning policies through the Local Development Framework (LDF)

## Section 6 Delivery Plan

Reducing Lincoln's carbon footprint whilst communicating action on climate change and adapting the city, requires a partnership approach to ensure effective implementation.

### Actions:-

- To produce an action plan which will be monitored on an annual basis by the Low Carbon Lincoln Partnership. The action plan will establish an agreed target for Lincoln and outline projects that are contributing to the aims of each sector identified in this report and also record CO2 savings where possible.
- The LCLP will set up an informal mailing network to enable members to communicate, keep each other informed of actions and initiatives, consultations and share information.
- A year end report will be produced in April of each year. This will use the Government's National Indicator 186: per capita emissions in the Local Authority area, to monitor progress towards the agreed target.
- Projects and actions that have been identified as contributing to the agreed target will be reviewed every year to ensure the agreed target can still be met so any shortfalls in emission savings are recognised early on.

### Partnership

A webpage on the city council's website will be created for the LCLP that will include a list of partner organisations as well as an up to date LCL Action Plan. In addition a LCL mailing list has been set up, [lowcarbonlincoln@lists.aktivix.org](mailto:lowcarbonlincoln@lists.aktivix.org) members can sign up to this mailing list at <https://lists.aktivix.org/mailman/listinfo/lowcarbonlincoln>. The mailing list will help encourage communication and the sharing of information and knowledge between members.

### Meeting long term targets

Meeting an agreed target by 2020 based on a 2005 baseline is dependent on both local and national projects delivering significant carbon savings. However, meeting this target will require changes in our approach and attitude to using and sourcing energy. Based on the Government's Low Carbon Transition Plan, 30% of the nation's electricity needs will be met by renewables by 2020. The scenarios that will be developed to estimate how the agreed target reduction in CO2 will be met are reliant on the national energy infrastructure making this change to renewables. The annual update of the LCL plan will outline the progress of the switch to renewable forms of electricity and if required, new CO2 reduction scenarios will be produced to take into account any shortfalls.

### Next Steps

The LCL plan will be reviewed on an annual basis to establish progress towards the target and take into account changes that are likely to impact in Lincoln's carbon footprint.

## Further information

For further information on climate change in Lincoln and the Low Carbon Partnership please contact:

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## Glossary

**Greenhouse gases (GHGs)** - gases in the atmosphere, which absorb thermal infra-red radiation emitted by the Earth's surface, the atmosphere and clouds. GHGs include water vapour, carbon dioxide, methane and nitrous oxide.

**Mitigation** – taking action to reduce the causes of climate change by reducing the amount of greenhouse gases in the atmosphere.

**Adaptation** – taking action to cope with the consequences of climate change, such as an increased risk of flooding.

**Carbon Dioxide** - or CO<sub>2</sub> is a gas in Earth's atmosphere. It occurs naturally and is also a byproduct of human activity such as burning fossil fuels and land-use change. It is the principal greenhouse gas linked to man made climate change.

**Biofuel** - A fuel derived from recently dead biological material and used to power vehicles (can be liquid or gas). Biofuels are commonly derived from cereal crops but can also be derived from dead animals, trees and even algae. Blended with petrol and diesel biofuels can be used in conventional vehicles.

**Renewables** - Energy is derived from natural processes that are replenished constantly. They include geothermal, solar, wind, tide, wave, hydropower, biomass and biofuels.

**CRC energy efficiency scheme** - The UK's first mandatory carbon trading scheme that covers all organisations that consume over 6000 MWh of electricity in a year.