Leeds Climate Change Strategy

Making the Change 2012 to 2015

Climate Leeds

the Leeds Initiative

The Leeds Initiative has published five City Priority Plans to 2015, which set out the key outcomes and priorities to be delivered by the council and its partners. "Improving the environment through reduced carbon emissions" is one of the key priorities that has been agreed.

Core Cycle Route

Contents

Leeds Climate Change Strategy: Making the Change

Foreword

Leeds Climate Change Strategy: Making the Change

When we published our first strategy in 2009, we acknowledged that climate change was already affecting how we live. That view has not changed between then and now.

Our way of life here in Leeds relies on a finely balanced temperate climate, and small changes to it can have dramatic impacts on our daily lives. Evidence shows that climate change is starting to alter this balance, threatening the health of our citizens, damaging our natural environment and disrupting the supply chain that our local economy relies on.

There now exists a firmly established scientific consensus that the world is getting warmer and that mankind's activities are the cause. Even if the worst effects happen in other countries, the continuing economic crisis has emphasised how globally connected life in Leeds now is. Local quality of life is dependent on global quality of life. More than ever it is clear that a resource efficient and climate resilient city will be a better place to live in. It will also be more competitive and better able to ride out economic shocks in future.

And we must not forget that climate change affects the most vulnerable disproportionately – those who add least to the problem are the worst affected by it. So taking action on climate change contributes to achieving our overall Vision for Leeds to be the best city in the UK by 2030, by being fair, sustainable and inclusive. We have included specific actions in our City Priority Plan 2011 to 2015 to achieve this.

This strategy is not about listing all the actions already underway in Leeds. Instead, it identifies the strategic priorities for Leeds for the next three years, focusing on actions that we, the people of Leeds, can take. We will reduce greenhouse gas emissions from Leeds to help regional, national and global efforts to avoid dangerous climate change and prepare for the unavoidable impacts of climate change. These priorities build on progress already achieved through our first Climate Change Strategy – the Vision for Action – and have been jointly developed with our partners throughout Leeds. Our next task is to develop a joint action plan and regularly report on our progress.

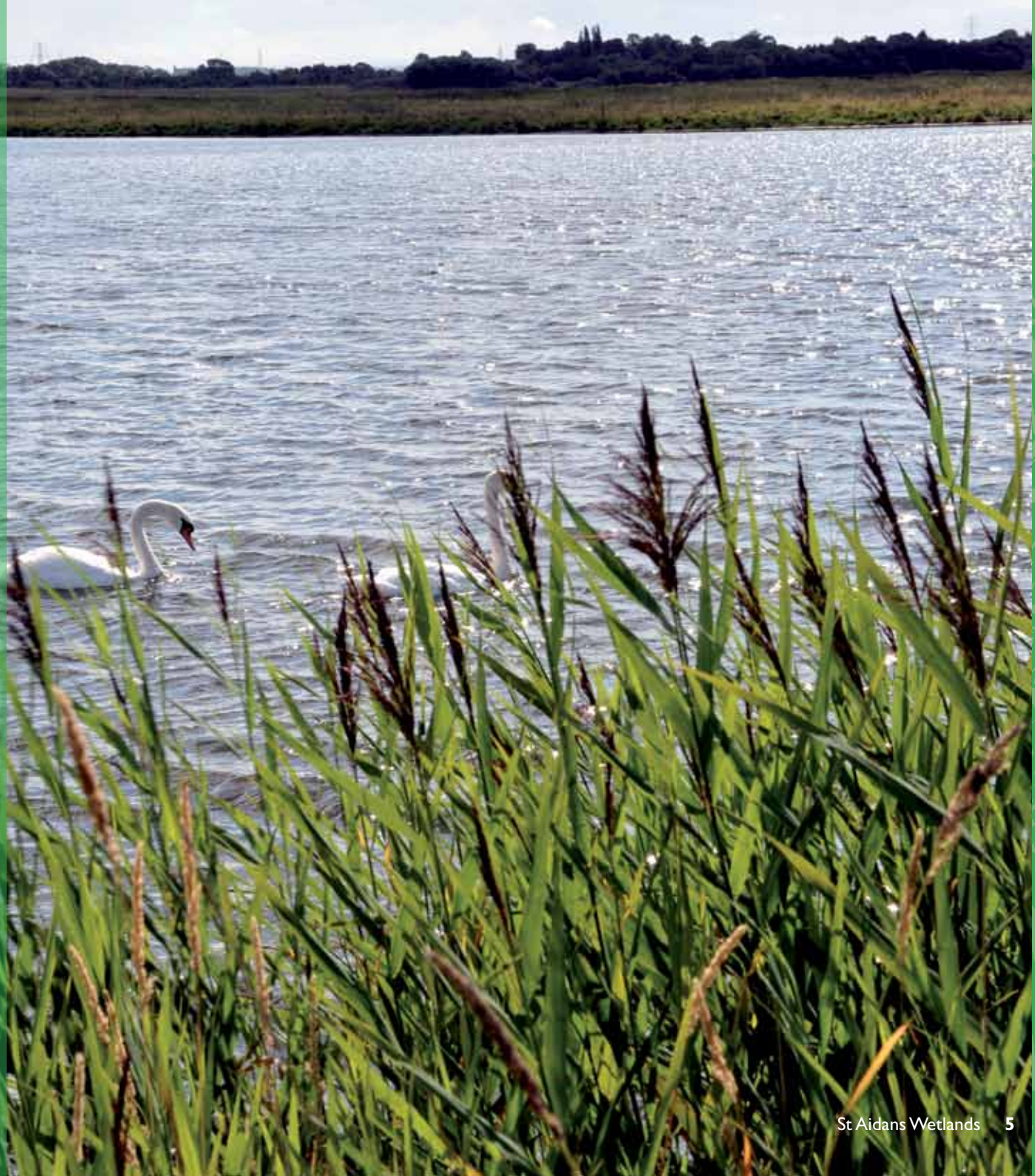
By working together in this way, we will start to tackle climate change effectively. I believe that together we can make a significant and lasting impact, both on the extent of climate change and the degree of its effects on the lives of Leeds' people.

I am confident that when we revise this strategy in 2015, it will be clear that our partnership work has delivered clear, tangible benefits to both Leeds and the global climate.

Councillor Mark Dobson
Chair of the Leeds Climate Change Partnership

Vision

If we collectively make the most far-sighted decisions possible, within budgetary and technical constraints, the following scenarios could become the reality that we live in in 2015, 2021 and 2050.



By 2015…

Leeds is making good progress on its low carbon journey. The solid foundations laid before 2011 are now delivering results. Residents and businesses that were quick to embrace low carbon living are reaping the rewards through lower bills.

Energy efficiency of existing housing has improved significantly with a free home insulation scheme filling thousands of lofts and cavity walls in private homes. Every year, tens of thousands more homes in neighbourhoods across the city get a comprehensive energy make-over, creating sustainable jobs and saving residents millions.

Solar panels are appearing on buildings at an ever-increasing rate. They act as an immediately visible illustration of the less obvious changes happening inside buildings. This tangible display of underlying change is helping the people of Leeds to question habits and make lifestyle changes.

Recycling rates have exceeded 50% and even more encouragingly, total volumes of waste are decreasing as residents reuse more and businesses reduce packaging. Some homes and businesses are now powered by electricity generated by local waste treatment facilities. Spare heat from industry is captured and used to heat local homes and businesses.

Food waste is becoming a valuable resource. An innovative partnership with the private sector is turning household and industrial food waste into biomethane and fertiliser at anaerobic digestion plants. Some of the biomethane will directly supply the fleets of vehicles running on the green fuel, while some will be used to generate electricity for the growing number of electric vehicles on Leeds' streets. Other public-private joint ventures are creating the right frameworks to attract investment for large-scale renewable energy projects, district heating and to improve commercial properties. This new green entrepreneurialism is symbolised by the Aire Valley eco-settlement. Low carbon industries in the Enterprise Zone are supplying products and services for new low carbon housing, connected to a low carbon energy infrastructure.

Investment for significant new public transport infrastructure has finally been secured and, although it won't be completed for several years, the existing public transport network has been improved and is now better used. The expanding cycle network and investment in green spaces are encouraging more people to safely walk and cycle, creating confidence in others to leave their cars at home. And the young fruit trees planted across Leeds' parks and verges are now supplying their first crops.

Leeds has started to exploit the potential of low carbon living and is keen to build on early successes.

By 2021…

Leeds looks and feels like a different city. It's a stronger city, a more mature city. It's a city that is happy with its past achievements and looking forward to the future. Leeds is prospering, with a diverse economy strengthened by the booming environmental goods and services sector. Leeds is physically bigger too: well planned and executed developments that are low or zero carbon complement the existing built environment. Green spaces have been created, enhanced and linked and green roofs on new buildings are becoming commonplace. The massive energy efficiency drive has insulated all but a few cavity walls and lofts and solid wall insulation is now affordable and being well used. An informed and concerned public demands more sustainable goods and services and many businesses have profited from responding to this demand, supplying customers within the region and franchising their innovations for production and local distribution elsewhere. All organisations trade a maximum proportion of their waste stream as inputs to other processes and products. Overall carbon footprints are reducing year on year as resource consumption declines.

Clean, low carbon mobility underpins progress. Leeds' citizens are proud of the safe, reliable and affordable public transport service. Careful re-engineering of roads means cycling and walking rates have surged. The cost of carbon is reflected in the cost of motoring and inefficient private transport is reducing, but is still affordable for essential journeys. Appropriate scale renewable energy projects are much more visible across Leeds and essential district heating systems are growing and linking up in densely populated areas. Recycling rates for domestic

waste have exceeded 60%, significant value is now being recovered from residual waste, and waste to landfill has been reduced to less than 10%. Recent extreme weather events have tested our adaptation strategies, which are responding well. New drainage systems, better designed urban areas and new river defences are reducing the risk of flooding. New buildings are all now built to cope with climatic conditions at least 50 years ahead, as well as reducing their overall environmental impact in terms of design, construction and use.

Leeds is thriving; there is a collective confidence that together we can tackle climate change.

By 2050...

Leeds is almost unrecognisable. Within two generations, the city is in a different climatic zone: the hot summer of 2003 is considered cool now. Warmer, wetter winters mean less heating but more vermin and additional risks from other organisms not previously found at 53 degrees north. Droughts, floods and high winds are far more commonplace. Society is very different yet quality of life is not greatly affected, thanks to the far-sighted decisions taken at the start of the century. The built environment is well able to cope and careful planning has allowed the natural environment to adapt to the new climate. Personal working and leisure patterns have changed to reflect the prevailing weather conditions and a resource-constrained society. The economy and social life are much more locally focused with inputs and outputs covering much smaller distances than was the case in the early 21st century.

Technological innovations are all around us, affecting the way that we produce and use energy, the way that we communicate, travel and do business. Behaviours have changed too: carbon is priced into all activities and the population has responded by choosing lifestyles that allow them to live within smaller carbon budgets. Leeds has been better able to cope than have many other places and the city has welcomed and integrated people who have been forced to flee land-use and water conflicts elsewhere in the world.

Leeds is an exemplary global city, coping with life in a new climate thanks to far-sighted decisions and an ongoing focus on practical action.

Background

Leeds Climate Change Strategy: Making the Change

In February 2008 the Leeds Initiative published a detailed climate change strategy for consultation. Written with the help of almost 100 organisations, it contained a large amount of local evidence. The responses were largely supportive of the approach proposed for Leeds and the result was publication of the Vision for Action 2009 to 2011. The consultation document remains a valuable source of evidence.

The Vision for Action achieved notable progress over just two years, including establishing a challenging target to reduce emissions by 40% between 2005 and 2020, with a pathway to achieving it, the launch of a multi-million pound home insulation scheme called Wrap Up Leeds and development of a major report into the Economics of a Low Carbon City Region. Yet the financial crisis and austerity measures have severely impacted two critical proposed projects: the Leeds Flood Alleviation Scheme and the trolleybus. A third project, to install solar panels on council homes in order to generate a fund for long-term carbon reductions, has also been hit by rapidly changing government policy.

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Scope and Purpose of this document

Leeds Climate Change Strategy: Making the Change

Making the Change is the Leeds Initiative's new Climate Change Strategy, building on the foundations of the Vision for Action. It summarises the key issues (see pages 14 - 25) which need to be addressed so Leeds can mitigate and adapt effectively. Each sub-section prioritises a short list of essential actions to undertake. The strategy is supplemented by an annual action plan, which sets out the detail of who will do what, by when, in order to meet our stated priorities.

Mitigation
means reducing greenhouse gas (GHG) emissions to a safe and stable level.

Adaptation
means building climate resilience to ensure that our society and natural environments can cope with a radically different climate.

Making the Change is for Leeds as a whole and so concentrates on city-wide issues. By that we mean actions which are the responsibility of a number of partners across the city to take forwards, not just the city council. The city council, Leeds Initiative partners and other individuals and organisations across Leeds can all make a difference to climate change by concentrating on emissions from their estates, fleets and day-to-day activities. Making the Change encourages the formation of mutually beneficial partnerships to make our work more effective and to progress issues that are not limited to just one organisation.

We are also aware that Leeds is connected to the city region, nationally and internationally. This means that we must take advantage of support and investment available outside the city. We will not invent solutions for Leeds where that solution already exists elsewhere. Our relationship with the rest of the world also means that we are not entirely in control of what happens in the city. International market forces and policies can both boost and damage efforts to tackle climate change.

Ultimately, Making the Change will help galvanise action from organisations across Leeds. Together, we can make Leeds the best city in the UK: resilient to climate change with a prosperous and sustainable low carbon economy and a high quality of life.

Context

Leeds Climate Change Strategy: Making the Change

Strategic Context

There are many important strategies, policies and plans already in place in Leeds and climate change is now recognised within all of them. The Vision for Leeds 2011 to 2030 acknowledges that climate change is one of the three major challenges that have emerged since the last Vision was published in 2004. To achieve our aim to become 'the best city in the UK' by 2030, we will have to transform the economy in Leeds to a low carbon one and address the impacts of a changing climate. The Vision identifies actions in every sector, from green manufacturing to high-quality public transport, alternative energy to local food, sustainable housing to reduced waste. Making the Change will provide the critical short-to-medium term actions to achieve this longer term Vision.

The Vision is supported by the City Priority Plan 2011 to 2015, which brings together a number of key four-year priorities that will help us deliver the 2030 Vision. It is supported by five separate action plans that address the five key themes. Of these, two contain priorities which are directly relevant to Making the Change:

Best city... for business:

1. Support the sustainable growth of the Leeds' economy.
2. Improve journey times and the reliability of public transport.
3. Improve the environment through reduced carbon emissions.

Best city... to live:

1. Maximise regeneration investment to increase housing choice and affordability within sustainable neighbourhoods.
2. Enable growth of the city whilst protecting the distinctive green character of the city.
3. Improve housing conditions and energy efficiency.

This strategy will need to report progress on a regular basis to the Sustainable Economy and Culture Strategic Partnership Board. Other key issues and challenges will be passed to relevant strategic partnership boards as appropriate.

City-Wide Emissions

Since publication of the Vision for Action local emission data has improved significantly. The table below shows the emissions data provided by DECC from 2005 (the first year high quality data is available for) to 2009 (the most recent published data). This data is for direct emissions sources that the city can influence or control and therefore excludes waste, large industrial sites, aviation and motorway traffic.

Year	Industry and Commercial ('000s, t CO_2)	Domestic ('000s, t CO_2)	Road Transport ('000s, t CO_2)	Grand Total ('000s, t CO_2)	Population ('000s, mid-year estimate)	Per Capita Emissions (t CO_2)	% gross reduction since 2005
2005	2127.3	1849.8	1108.9	5085.9	750.6	6.8	n/a
2006	2140.3	1826.6	1086.2	5053.1	762.5	6.6	0.6
2007	2056.7	1757.5	1089.6	4903.8	772.2	6.4	3.6
2008	2035.9	1739.4	1049.7	4825.0	779.3	6.2	5.1
2009	1785.6	1569.7	998.1	4353.4	787.7	5.5	14.4

In 2008/09 Leeds City Council produced 136,989 tonnes of carbon dioxide from buildings, street lighting, fleet vehicles and staff travel. Building emissions (over 70% of council emissions) have been falling steadily since the 1990s and total emissions reduced by 10.7% between 2008/09 and 2011/12, well ahead of the target of 6.4%.

To help to understand emissions trends and opportunities across the city, we plan to work with several of the larger organisations in the city to report emissions and monitor change on an annual basis.

City-Wide Emissions Reduction Targets and Trajectory

Leeds has committed to reduce total emissions by 80% between 2005 and 2050, broadly in line with the UK Climate Change Act. This means cutting total emissions to no more than 1,017,000 tonnes of carbon dioxide, a reduction of over 90,000 tonnes every year.

To keep us on track, we have adopted an interim target of a 40% reduction between 2005 and 2020. Total emissions have reduced by 14.4% from 2005 to 2009, an annual rate of 3.6%. To reach the target, a rate of 3% every year will need to be sustained from 2009 to 2020.

These are very tough targets. But we know they are possible, given a strong desire to achieve them. We commissioned a study in 2010 using the Vantage Point software that indicated that if the population of Leeds grew to one million people by 2020, total emissions could still fall by 38.5%. If the population grows to less than 900,000 then 40% could be achieved. However, this requires all sectors to adopt almost all available emission reduction behaviours and technologies, including some that are currently not considered cost effective.

To help make a financial case for these interventions, Leeds City Region commissioned a separate and much more detailed study called the Economics of Low Carbon Cities. This used downscaled evidence

from the Committee on Climate Change to identify interventions that were cost effective, cost neutral and not currently cost effective. The study identified very significant commercially viable opportunities for decarbonisation at the city-scale and found that exploiting these opportunities would generate wider social and economic benefits.

The study combined local action with the likely decarbonising effects of projected energy price increases on demand, and of lower carbon forms of energy supply, and concluded that by 2022 the Leeds City Region could cut its 1990 levels of carbon emissions by 35% by exploiting the profitable opportunities and by 40% at no net cost. Headline findings were that:

- The 2011 energy bill for the city region was approximately £5.4bn and this is projected to rise to over £7.2bn by 2022.
- Every £1 billion of investment in low carbon options would generate £220 million of energy cost savings, paying back, on commercial terms, in just over four years.
- Every £1 billion of investment would also create 1,000 new jobs and wider economic benefits of a further £50 million a year.
- Such investments would also protect competitiveness, improve energy security, reduce fuel poverty and improve public health.

The challenges are not just financial; many measures will need organisations and individuals to accept change, not necessarily detrimental change, but change nonetheless. This will require a shift in cultural and social norms and for people to adopt new, lower carbon, habits. The rapid rise in recycling rates and the shift to more fuel efficient cars show that people are willing to change, but often need a helping hand. Inspiration from the partnership will be critical to success.

Early action now to limit emissions increases and to make cost-effective carbon reductions will put Leeds in a strong position in future.

Financing and Organising the Low Carbon Transition

Knowing that a 40% reduction in carbon emissions can be achieved at no net cost, using current technologies, is a very important factor. However, we cannot assume that just because the opportunities exist, this reduction will happen. Many carbon reduction technologies are now reaching maturity (domestic insulation, low energy lighting, A-rated white goods, condensing boilers and efficient diesel cars and vans to name but a few) but the breadth of opportunities identified by the Economics of Low Carbon Cities means that although the technologies are proven and commercially viable, their supply chains are not yet mature.

The Economics of Low Carbon Cities concludes that as well as showing ambition and leadership through strategies such as this:

"We need to think about some major innovations, particularly in stimulating the supply of and demand for major investment resources. We need to think about innovative financing mechanisms, based on new forms of cost recovery and benefit sharing and new ways of managing risk. And we need to develop new delivery mechanisms that can stimulate and sustain demand for investment in low carbon options by overcoming the many potential barriers to change."

Experience from other countries and other technologies show that maturity can be reached relatively quickly given support, both financial and organisational. The research described above has helped us to understand that our focus should be on efficient and low carbon delivery and control of heat for all sectors (particularly commercial and industrial) supplemented by insulation and a package of other measures in the domestic sector and the deployment of alternatively fuelled vehicles.

We know that there is significant public and private sector investment available for projects that reduce carbon (for example from the Green Investment Bank, European Investment Bank, pension funds and banking) but all of these require full business plans in order to attract finance. Support to develop full business plans in order to commercialise projects is in short supply, however some is available from Europe through mechanisms such as the European Local Energy Assistance (ELENA). We will make it a priority to seek funding from sources such as ELENA in order to develop a pipeline of commercially attractive low carbon investment opportunities that match our strategic priorities.

UK Climate Scenarios

The Hadley Centre (part of the UK Met Office) and the Tyndall Centre have modelled scenarios of future climate change based on different levels of emissions. The latest projection was published in 2009 by the UK Climate Impacts Programme (UKCIP). These display probability ranges for the likely changes to key climate variables for 2020, 2050 and 2080.

Understanding Climate Trends and Risks in Leeds

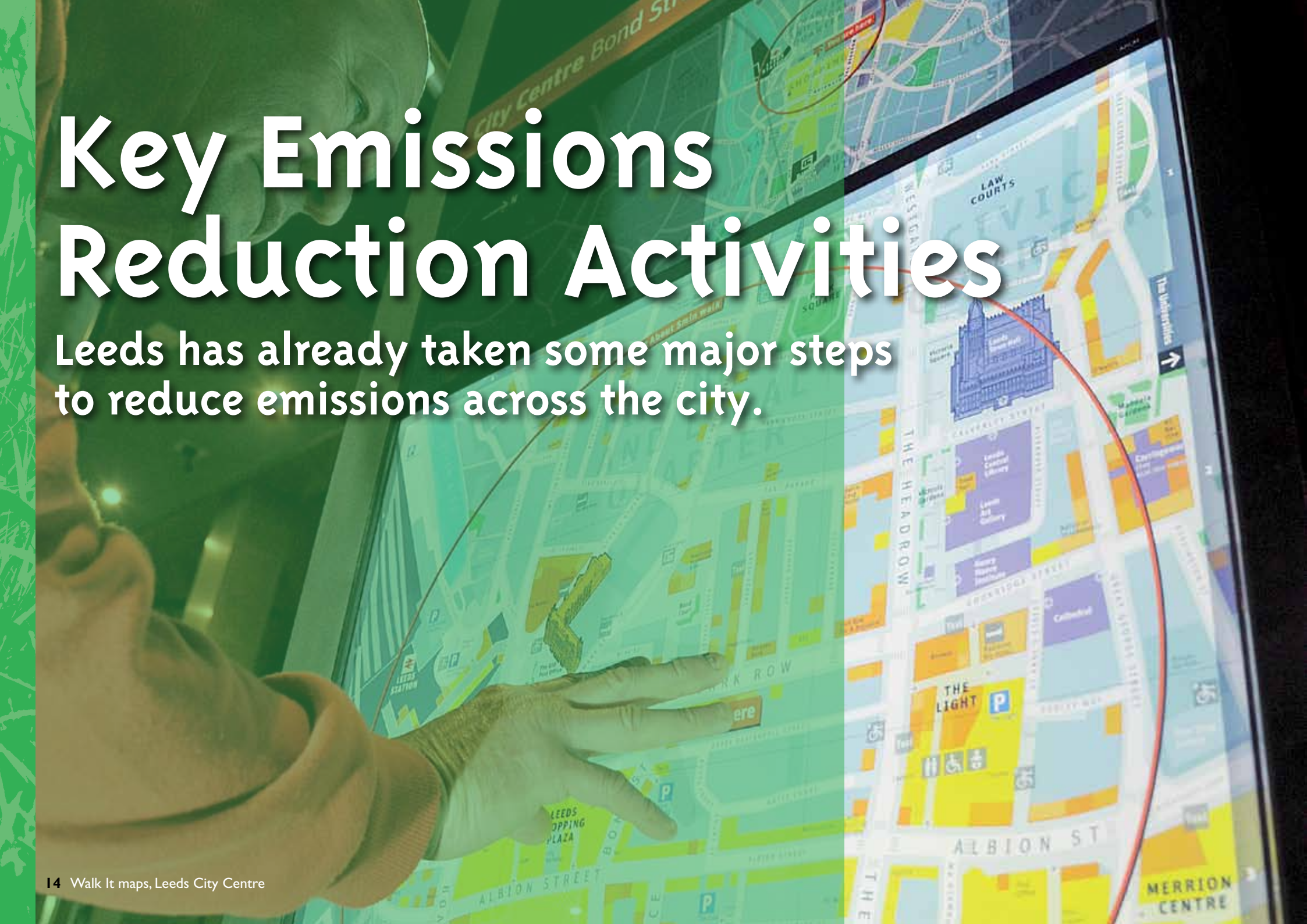
The former Leeds Weather Centre and the Leeds City Council weather station have been used to obtain comprehensive weather data for central Leeds for the period 1985 to 2011. This data provides supporting evidence for the rising number of severe weather events that we experience in Leeds. Over recent years, river flooding, flash flooding and gales have all become more frequent. These trends support the predictions made by UKCIP so we can be confident that longer-term forecasts are also broadly correct.

The council has also developed a Local Climate Impact Profile (LCLIP) which catalogues extreme weather events that have occurred in the city and their consequences. The LCLIP has identified that Leeds is most vulnerable to floods and transport and emergency services are most frequently disrupted.

Flooding in Leeds

Key Emissions Reduction Activities

Leeds has already taken some major steps to reduce emissions across the city.



We know that we must do much more in future if we are going to reduce emissions to a level that will not lead to dangerous climate change.

The target of an 80% emissions reduction is so challenging that we will need all sectors (households, businesses and transport) to contribute to emissions reductions efforts. Whilst the measures identified have capital costs associated with them, most will save many times more than their cost through reduced energy costs and reduced carbon taxes, even at today's prices. All the indications are that energy prices will rise sharply in future, so investment now, even in a measure with a marginal payback, can be seen as a hedge against future energy price rises. The next few pages describe the key priorities that we will push for up to 2015.

Home Energy Efficiency

Homes in Leeds are already much more energy efficient than they were in 1996. Investments by home owners and landlords have been supplemented by utility company grants, government grants and the Decent Homes programme and have been coordinated by the Affordable Warmth Partnership. Historically, efforts have focussed on simple insulation measures, mostly in less affluent neighbourhoods and fuel-poor households and heating improvements to public sector housing. More recently, the focus has widened to demonstrating technologies such as solid wall insulation for hard to treat homes, micro-renewables and to encouraging more affluent households to also invest in improvements. From late 2012, the Government's Green Deal will provide a way to finance, promote and deliver energy efficiency improvements to all properties to create a step change in emissions reductions.

Leeds Priorities for Action

- Use Wrap Up Leeds to insulate at least 15,000 private sector lofts and cavity walls during 2012.
- Develop and promote an overarching domestic energy efficiency and renewable energy programme, linked to the Green Deal, Energy Company Obligation, Feed in Tariffs and the Renewable Heat Incentive, to offer packages of improvements to households in Leeds.
- Facilitate good house-keeping advice to occupants regarding insulation, heating, hot water, appliances and lighting, including appliance purchase and disposal.
- Work with energy companies to help develop a 21st century energy infrastructure by creating district heating networks, and installing smart meters and smart products.

Leeds Future Vision

By 2015, the Green Deal will be making whole house improvements to over 10,000 homes every year, generating major energy efficiency improvements.

Sustainable Transport

As the population of Leeds grows and the city becomes more prosperous, we must find solutions to congestion. Leeds has many good schemes in place to encourage people to walk and cycle more and to use private cars less, but the infrastructure in Leeds needs to be improved if we are to take this to the next level.

Leeds has repeatedly undertaken detailed design work for major public transport improvements over the last 20 years but has to date not attracted the major investment required to build the schemes. A major proposal has been submitted to government for investment in the New Generation Transport (NGT) trolleybus scheme. NGT would mean modern, accessible, low emission vehicles providing reliable, comfortable and frequent journeys into the city centre from Park & Ride sites located at Stourton and Bodington. If approved, it is anticipated that the scheme could be operational by late 2018.

By 2015 it is envisaged that new rail stations will have recently opened, or be about to open, at Kirkstall Forge and Apperley Bridge with park and ride facilities. These will increase the availability of rail travel to more people and provide the opportunity to replace car journeys with rail trips. A new bus-based park and ride site will have opened and further sites will subsequently be opened to provide a ring of park and ride sites around the outer ring road.

There have been some minor successes recently, notably the approval of the southern exit to Leeds city station and the investment in hybrid diesel-electric buses on some of the main routes. The A65 Quality Bus scheme is currently being built on Kirkstall Road and is on track for completion in 2012. This will improve bus journey times and reliability on this key corridor. However, without a larger investment, emissions from transport are unlikely to fall at the rate required.

The Government is looking to devolve greater powers to city regions in the form of 'City Deals', starting with the eight English core cities. The aim of this is to unlock economic growth and to empower the delivery of infrastructure. This will provide greater freedom and flexibility for planning and delivering transport schemes, and may include devolved rail powers. In West Yorkshire there is a proposal to develop a £1bn West Yorkshire Transport Fund. This would be used to fund major transport projects from 2015 onwards with the key objective of supporting economic growth. Work is currently being progressed to assess a range of interventions with the intention of developing a package of schemes that would provide benefits to all the West Yorkshire authorities, and to ensure in particular that more disadvantaged communities gain a better than average improvement in employment accessibility.

While the city seeks this investment, we will continue to work with employers to incentivise sustainable transport, promote walking and cycling and work with partners in Leeds to jointly procure low carbon vehicles.

We should also work towards a vision where future transport looks very different to today. This doesn't just refer to transport technologies, such as high-speed rail, but an expectation that the economy will become more localised. Our planning policies support local patterns of employment, there's an upsurge in local food projects and more people are avoiding travelling by working flexibly. If encouraged, these trends could ultimately have a greater impact on transport CO_2 emissions than new infrastructure.

Leeds Priorities for Action

- Major public transport infrastructure investment secured that will ensure all of Leeds is served by high-quality, accessible, affordable and reliable public transport.
- Support climate change partners and major employers to incentivise staff to use sustainable transport and to cost effectively procure low emission fleet vehicles.
- Continue to develop the infrastructure to make smarter choices and sustainable modes, including walking and cycling, safe and attractive alternatives to driving.
- Work with partners to develop more detailed plans for integrated public transport and smart ticketing.

South entrance proposal to Leeds train station

Leeds Future Vision

By 2015, the proportion of car-based trips into central Leeds will have decreased and we will have secured finance to reduce congestion and emissions through investment in the transport network, particularly public transport, coupled with appropriate demand management.

Waste and Resource Efficiency

Direct greenhouse gas emissions from waste are relatively small. However, inefficient use of resources means that we need to produce more goods, using more resources, than if we used long-life, durable products that we recycled at the end of their lives. We also know that people in Leeds are recycling more every year and strongly associate recycling with positive environmental behaviour. Recycling can act as a gateway behaviour, leading people onto other actions such as home energy efficiency or cutting car use. The Integrated Waste Strategy 2005 to 2035 already contains strong targets and actions to constrain municipal waste generation, improve recycling rates and minimise landfill. We will therefore focus on maximising the emissions reductions from landfill diversion through recycling and residual waste treatment, and on engaging key industries and smaller businesses. To engage with businesses, we will work closely with business support organisations such as WRAP.

Leeds Priorities for Action

- Inspire residents to recycle more of their household waste and provide better recycling services in order to meet more ambitious recycling targets.
- Support businesses to deliver resource efficiency improvements and encourage innovation to turn waste products into useful resources.
- Within existing plans for recycling and residual waste treatment, push for maximum carbon reductions through appropriate segregation of waste and utilisation of best technology solutions, particularly combined heat and power, district heating and anaerobic digestion.

Leeds Future Vision

By 2015, we will have almost completed construction of the infrastructure required to turn all municipal waste in Leeds into valuable resources.

Business Emission Reduction

Over a third of the emissions in Leeds are from the commercial and industrial sectors. This is a very disparate group of organisations, ranging from sole traders to large multinationals and encompassing public and third sector organisations. No single approach will be relevant for all organisations but our 2008 climate change consultation showed clearly that people in Leeds expect the council and Leeds Initiative partners to lead by example by reducing their emissions.

The council, the health sector, colleges and universities, social enterprises, voluntary organisations and businesses are already finding ways to speed up carbon reductions. This is primarily through the use of energy efficiency and low carbon technologies, energy management, staff engagement and procurement of low carbon goods. In future, we will need to think differently, recognising that there can be a competitive advantage to working together to purchase energy and to share ideas, services and premises.

Although government support for business carbon reduction has been drastically reduced recently, with the Carbon Trust being the only provider now, the private sector has responded. The Chamber of Commerce provides a business-to-business service database and utility analysis service, CO2Sense has developed a green product and services database and can provide advice and grants to business, and both organisations actively campaigned to bring the Green Investment Bank to the Leeds City Region. Although this bid was not successful, the working relationships have endured and Leeds City Region's Green Economy Panel now has an ambitious programme of work to reduce emissions and stimulate the low carbon economy.

Many consultancies and equipment suppliers are now able to provide innovative packages to businesses, whereby energy savings repay financial investment over a period of time. The council has recently used the Re:fit framework to contract with e.on to invest in a package of measures to nine major buildings, which collectively will save 1,663 tonnes of CO_2 and energy savings are guaranteed to be made over 7 years.

It is essential that this sector expands so that local businesses can benefit from the greater profitability that resource efficiency brings.

Leeds Priorities for Action

- Work with Leeds Chamber of Commerce, CO2Sense, Institute of Directors and other business support organisations to ensure that local businesses have access to low carbon advice and services to assist them to cut emissions and to develop a low carbon supply chain.
- Develop an Energy Services Company (ESCo) or public private partnership to provide investment for low carbon retrofit of existing commercial space, to assist with implementation of measures and to liaise between tenants and owners.
- Work with organisations responsible for high CO_2 emissions in Leeds to collate emissions reduction targets and monitor progress and use this information to develop case studies to support smaller organisations to take action.

Leeds Future Vision

By 2015, major businesses will have made significant carbon reductions and smaller businesses will have appropriate support in place.

Low Carbon New Developments

Leeds has experienced significant growth recently, but now that growth has slowed and energy costs have risen, our businesses and residents are feeling the pinch. By investing now in energy efficiency and clean, local energy generation, known as decentralised energy, we can both meet long-term emissions reduction targets and increase the resilience of the economy to future price shocks.

There are opportunities for local businesses to develop products and services to support low carbon energy and the public sector can lead the way through the use of sustainable procurement. Supporting our businesses to develop these goods and services and the skills to deliver them will help to build a resilient future economy, with local demand met by local supply. However, it is likely that we will need to support the workforce to retrain to take advantage of these opportunities, particularly in labour-intensive work such as solid wall insulation.

We have a growing portfolio of renewable energy generation in the city, particularly solar photovoltaic, small wind, and energy from various waste streams. However, the most important technology is district heating. This uses a network of well-insulated underground pipes to transport hot water or steam to a number of buildings and often uses a centralised generation station. The strength of the technology is that the pipes have lifetimes of over 100 years, allowing lower carbon energy sources to be plugged in, as equipment needs replacing.

In Leeds, we already have a well established network which has been providing heating, cooling and electricity to both the Leeds General Infirmary and parts of the University of Leeds since the 1970's and a number of smaller systems, such as the plant supplying over 200 new homes in Yarn Street, Hunslet. Now, some developers are making low carbon energy part of mainstream developments in Leeds. These include a wind turbine at Knostrop and community heating for the Eastgate development. The proposed Recycling and Energy Recovery Facility provides an opportunity to develop a district heating network for much of the Aire Valley, which could provide low carbon and low cost energy to encourage companies to locate in the area.

Leeds must plan strategically to continue in its role as a major regional centre. The challenge is to ensure that new buildings, and the associated infrastructure, contribute to the long-term vitality of the Leeds economy with minimal impacts on the local and wider environment. This means designing the city to reduce fossil fuel energy requirements, reduce transport demand and to cope with changing weather patterns.

To do this, we have to transform the way buildings are designed, connected, constructed, managed and used. The emerging Local Development Framework (LDF) addresses this by considering the carbon impacts of location, built form and transport. The overall development pattern will seek to reduce journeys by private car. Government still has a programme of using Building Regulations to progressively reduce the carbon intensity of both domestic and non-domestic buildings. To help prepare the supply chain for this policy, major developments in Leeds will be encouraged to use on-site renewable energy, connect to district heating networks or have lower CO_2 emissions than required by Building Regulations. We will provide evidence to identify the parts of the city that are most appropriate for different low carbon technologies, including district heating, and where possible, we will use council or Leeds Initiative partner land to help develop low carbon energy infrastructure.

Leeds Priorities for Action

- Use the results of the Green Jobs and Economics of Low Carbon Cities research to develop economy and skills plans that support a low carbon, resilient, economy.
- Support the development of Aire Valley Leeds as an exemplary Urban Eco-Settlement characterised by efficient homes, a sustainable energy infrastructure and low carbon industries.
- Develop an arms-length energy company for Leeds to lead the strategic development of renewables and district heating networks and to work with the private sector to attract investment to build them.
- Develop and enforce appropriate planning policies and guidance within the Local Development Framework and Sustainable Construction Supplementary Planning Document.

Wrap Up Leeds - home insulation

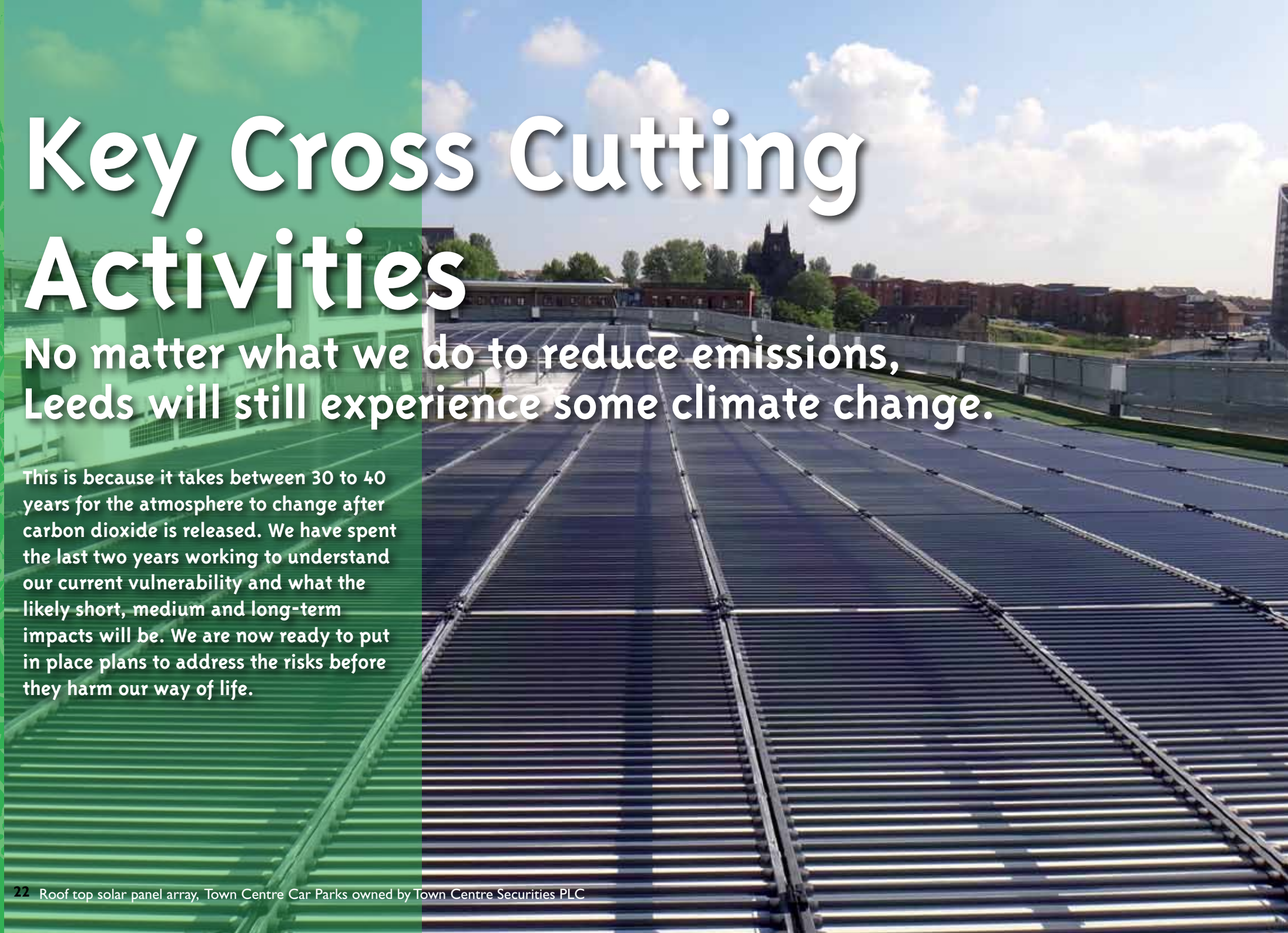
Leeds Future Vision

By 2015, major low and zero carbon developments have been built, underpinned by low carbon energy supply, to support the transition to a prosperous low carbon economy.

Key Cross Cutting Activities

No matter what we do to reduce emissions, Leeds will still experience some climate change.

This is because it takes between 30 to 40 years for the atmosphere to change after carbon dioxide is released. We have spent the last two years working to understand our current vulnerability and what the likely short, medium and long-term impacts will be. We are now ready to put in place plans to address the risks before they harm our way of life.



 Roof top solar panel array, Town Centre Car Parks owned by Town Centre Securities PLC

Risk Assessment and Adaptation

We are privileged in Leeds that we have access to essential data from our weather station and that we have already started adaptation action. The most important group is the West Yorkshire Resilience Forum, which is responsible for assessing the risks faced by the community, planning for emergencies and keeping the public informed during and after an emergency. It is made up of executive officers from organisations responsible for protecting the public in emergency situations - including the emergency services, health agencies, the Environment Agency and local councils. The Forum's Community Risk Register identifies six key climate risks (major river flooding, urban flash flooding, drought, heat waves, storms and gales, and low temperatures and heavy snow) all of which, except drought, are rated as high risk. Flooding (from rivers and flash flooding) is the most important current climate risk. The Council's Flood Risk Management Group has already taken action to reduce gully flooding and to help households in particularly vulnerable places to cope. City partners are now working with the Environment Agency to develop proposals for a city centre flood risk management scheme, under the umbrella of the Upper Aire Flood Risk Management Strategy.

West Yorkshire local authorities and organisations worked together to understand the less obvious climate risks and to assess how well prepared we are for them. This concentrated on health and social care, transport, utilities, the built environment, the natural environment and waste. The West Yorkshire Adaptation Action Plan (available on the yourclimate website) concluded that the West Yorkshire emergency services and emergency response plans were well developed and should be able to cope with short-term extreme weather events. However, there are opportunities to build climate resilience into the long-term development of the city, particularly in the natural environment, buildings and infrastructure.

Leeds Priorities for Action

- Work with the Environment Agency and others to develop and deliver an appropriate flood risk management scheme to protect Leeds city centre.
- Regularly appraise emergency response plans to ensure that key emergency services can support the city in the event of extreme weather events.
- Long-term planning for climate-resilient buildings, infrastructure and enhanced green infrastructure.

Leeds Future Vision

By 2015, we will have taken specific actions to address the key climate risks to make Leeds more resilient.

Natural Environment

The natural environment provides us with many climate relevant services, most of which we take for granted. We are shaded by street trees on hot days, can walk and cycle by the canal and in parks, use biomass from woodlands for fuel, eat food from farms, gardens and allotments, and the soil and plants capture carbon and slow flooding. As yet we do not currently fully understanding the value of these services or how, with careful management, the carbon reduction and adaptation opportunities can be maximised.

The natural environment is also vulnerable to the effects of climate change. As the climate warms, species will have to shift northwards or to higher ground. Some species will not be able to respond quickly enough or will reach a natural barrier, such as the top of hills. Good species selection in our parks and gardens will ensure that plants which live longer, such as trees, can cope with a warmer climate. By linking green spaces together it may be possible to help natural and semi-natural ecosystems migrate as climatic zones move.

The Leeds City Region's Green Infrastructure Strategy 2010 provides a very strong evidence base, recognising that a strong economy and robust society both depend on a high quality natural environment. As we move towards a future where considering the environmental limits and opportunities of the natural environment is ever more critical, we must plan ahead to ensure that our environment is working to its full potential.

For example, re-establishing tree cover, increasing the permeability of surfaces, and reinstating natural flood plains can dramatically alter storm water flows. Add to this the biodiversity dividends that can flow, more localised sources of renewable energy, greater scope for local food production and more attractive greenways for zero-carbon transport and there is a compelling argument for green infrastructure investment.

In 2011 we commissioned an initial study to help understand how food security and sustainability could be enhanced in Leeds. This indicated that almost 5,000 hectares of parks and school grounds were suitable for local food production - enough to provide over 20% of the vegetables needed by the population.

Our biggest issue remains one of ownership. So many organisations and people have an interest in the natural environment and receive a benefit from it that no single organisation is leading a low carbon response. Until this is resolved, the council will accept this responsibility.

Leeds Priorities for Action

- Research and develop specific proposals to enhance the natural environment to provide ecosystem services that build climate resilience (e.g. reducing urban heat island effect and slowing runoff) and to encourage more leisure use, walking and cycling friendly environments.
- Develop local food and non-food crop initiatives, particularly food growing within the existing urban fabric on parks or underused land.
- Identify the most vulnerable habitats within Leeds and develop solutions to protect biodiversity from the effects of climate change.

Leeds Future Vision

By 2015, decision makers will understand the critical importance of a robust functional landscape that provides the basic needs of the population of Leeds in a low carbon manner.

Communication and Inspiration

We will develop a communications plan to make sure people can follow progress on the priorities and actions we have identified in this strategy and find out about climate change activities in Leeds.

Our main platform for communication will be the climate change website – www.climateleeds.org - hosted by the Leeds Initiative, which we will further develop to become a resource centre for residents, communities and businesses.

Recent research by the Department for Transport[1] shows that the number of people concerned about climate change has continued to fall over the last five years as the recession has taken hold. Understandably, fears around job security and rising food and fuel bills, are at the forefront of people's minds.

Our communications strategy will consequently focus on how climate change is beginning to affect the UK and Leeds and why we need to take action now to make sure we can enjoy a good quality of life in the future. We will provide real-life examples of action on climate change that people can relate to and show that climate positive actions can be fun, not a sacrifice, with financial benefits, health benefits and social benefits. The young people of Leeds are particularly important for the future of the city and we will develop innovative communications tools to encourage young people to get involved.

Leeds Priorities for Action

- Develop and deliver a climate change communications strategy in partnership with communication outlets throughout Leeds, focusing on positive local examples of climate action.
- Develop a work programme to encourage and support young people to get involved with climate change activities.

Leeds Future Vision

By 2015, we will have inspired mass action to reduce emissions, championed by young people.

[1] *www.dft.gov.uk/statistics/releases/climate-change-and-impact-of-transport*

Monitoring and Reviewing Progress

Each year, we will provide a brief update on progress against the priorities for action contained in Making the Change.

This will be conducted through the Leeds Climate Change Partnership, the Leeds Initiative group with responsibility for driving this forward. A summary will be published as part of the council's Annual Environmental Statement. In 2015, we will assess progress towards the vision for 2015 to ensure progress towards the vision for 2021.

Acknowledgements

Leeds Climate Change Strategy: Making the Change

We would like to thank the hundreds of organisations that have helped to develop and deliver the Leeds Climate Change Strategy to date. We would particularly like to acknowledge the contribution of the Climate Change Partnership members for freely giving their time and expertise.

The Partnership is made up of representatives from the private, public and third sector as well as organisations representing a sector. It currently includes:

ARUP

CO2Sense

Connect Housing

Dickinson Dees

Environment Agency

Environment Forum

Federation of Small Businesses

Friends of the Earth

Groundwork Leeds

Leeds City College

Leeds City Council

Leeds Housing Forum

Leeds Metropolitan University

Leeds Teaching Hospitals Trust

Leeds, York and North Yorkshire Chamber of Commerce

Metro

NHS Leeds

Sustainable Resource Solutions

The Conservation Volunteers

University of Leeds

Glossary

Leeds Climate Change Strategy: Making the Change

Adaptation - adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Affordable Warmth Partnership - a working group of representatives from the public, private, and voluntary sectors, which works towards improving energy efficiency, reducing fuel poverty and delivering affordable warmth.

Anaerobic digestion - a process where biodegradable material is broken down in the absence of oxygen in an enclosed vessel, producing a gas (methane) and solid (digestate). The by-products can be useful, for example biogas can be used in a boiler, gas engine, turbine or gas-powered vehicles, and digestates can be re-used on farms as a fertiliser.

Biomass - organic matter available on a renewable basis for use as a fuel. Biomass includes forest and mill residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operation residues, aquatic plants, fast-growing trees and plants, and municipal and industrial wastes.

Biomethane - a naturally occurring gas produced by the anaerobic digestion of organic matter such as dead animal and plant material, manure, sewage, organic waste, etc.

Carbon Trust - a private company set up by Government in response to the threat of climate change, to accelerate the UK's move to a low carbon economy.

Combined heat and power (or cogeneration) is the term used when electrical energy is made onsite and the waste heat from the engine is utilised for a heating application such as making hot water or space heating.

Community heating hubs - see 'district heating'.

Decent Homes programme - the Government's national programme to make social sector housing and private sector housing for vulnerable people decent.

District Heating Networks (or community heating) is the distribution of steam or hot water through a network of pipes to heat a large area of commercial, industrial or domestic buildings or for industrial processes. The steam or hot water is supplied from a central source.

Ecosystem - a community of organisms and its physical environment.

Energy Company Obligation (ECO) - a finance mechanism central to the Green Deal. ECO will provide utility funded subsidies to make the more expensive energy efficiency improvements affordable. It will also provide grants to vulnerable people living in fuel poverty.

Enterprise Zone - specific areas where a combination of financial incentives, reduced planning restrictions and other support is used to encourage the creation of new businesses and jobs - and contribute to the growth of the local and national economies. Part of the Aire Valley is an enterprise zone.

Feed in Tariffs - an incentive introduced by the 2008 Energy Act, which provides additional payments for each unit of electricity generated by renewable technologies, regardless of whether or not the electricity is consumed on site.

Green Deal - the Coalition Government's initiative to support installation of energy efficiency measures to households and businesses without the need to pay upfront. It instead provides a mechanism to recover the cost of the measures through a charge on the electricity bill with reassurances that the cost of the repayments should be lower than the energy savings made.

Local Development Framework - the spatial planning strategy introduced in England and Wales by the Planning and Compulsory Purchase Act 2004. This is the framework within which local authorities develop a suite of planning documents (including the core strategy) to guide local development.

Low carbon retrofit - the refurbishment of domestic and non-domestic buildings to significantly reduce energy use and/or generate renewable energy resulting in much lower building related carbon emissions.

Mitigation - attempts to slow climate change by reducing greenhouse gas emissions or permanently removing carbon from the atmosphere.

Mini-Stern (or the Economics of Low Carbon Cities) - a report by the Centre for Low Carbon Futures that identifies the most effective and efficient way to decarbonise a city, using detailed modelling based on the Committee on Climate Change.

New Generation Transport (NGT) - a proposal for modern, accessible vehicles (trolleybuses) providing reliable, comfortable and frequent journeys into the city centre from Park & Ride sites located on the outskirts of Leeds.

Process heat - heat used in industrial processes to manufacture goods.

Re:fit - a programme originally developed by the LDA that offers a cost neutral way to reduce energy use and cut CO^2 emission in public sector buildings, through investment in energy efficiency measures with guarantees of performance from private sector contractors.

Renewables **(micro and large-scale examples)** - energy derived from a source that is continually replenished, such as wind, wave, solar, hydroelectric and biomass. Although not strictly renewable, geothermal energy is generally included.

Renewable Heat Incentive (RHI) - a government incentive which pays individuals and organisations for generating useful heat from renewable sources. It is very similar to the Feed-in Tariff and was introduced through the same legislation - the Energy Act 2008.

Smart meters - a type of advanced meter (usually an electrical meter) that identifies energy consumption in more detail than a conventional meter. They often use telemetry to communicate that information back to the local utility for monitoring and billing purposes, but users can also access the data to help make informed choices over energy use.

Urban Eco-Settlement - sustainable development on brownfield land for housing and regeneration.

Urban Heat Island Effect - refers to the tendency for urban areas to have warmer air temperatures than the surrounding rural landscape, due to the low albedo of streets, pavements, car parks and buildings. These surfaces absorb solar radiation during the day and release it at night, resulting in higher night temperatures.

WRAP - an organisation helping businesses and individuals reduce waste, develop sustainable products and use resources in an efficient way.

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Proposed recycling and energy recovery facility

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the Leeds Initiative
Local partnerships making things happen