

DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

**Towards a Minerals Local Plan:
Spring 2018 Consultation**

**Background Paper
Climate Change**

December 2017



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1. Introduction

- 1.1 Climate is the average weather, observed over a long period. The climate has never been static, with natural fluctuations taking place constantly.
- 1.2 Although the world's climate has always varied, in recent history the rate and extent of the changes have been attributed more to human activity rather than to natural processes. The impacts of human activities on the climate, including more extreme weather conditions, are caused through the emission of greenhouse gases and particularly Carbon Dioxide (CO₂). The effects of climate change are experienced through more extreme and unpredictable weather conditions, which may include hotter summers and warmer but wetter winters. The impacts of these include an increased risk of flooding.
- 1.3 The need to address the changing climate is a national priority, and there has recently been a step change through the national mechanisms, which have been put into place to seek to stabilise climate change and ensure that we can cope with the effects of more extreme weather conditions. The Climate Change Act has been supported by Government through policy and fiscal measures, which are designed to reduce climate change impacts and better prepare the UK for its effects.
- 1.4 Minerals are essential in maintaining our economy and lifestyle, but their extraction, processing and transport comes at a cost to the environment, being responsible for about 7% of total global energy consumption. Transport of primary minerals is responsible for around 40% of the energy consumed by the minerals industry. It has been estimated that the UK Mining and Quarrying industry accounted for just over 3% of UK carbon dioxide emissions in 2011.¹
- 1.5 This paper will explore how mineral development in Derbyshire and Derby impacts on climate change and how it can also provide opportunities to help reduce the impacts of, and strengthen resilience to, climate change and to make adjustments and adaptations to natural and human systems in response to the

¹ UK Environmental Accounts, 2013

actual or expected impacts of climate change. This will help us to be better equipped in the future to reduce, and deal with, the impacts of climate change.

2. What is Climate Change?

2.1 The term climate change refers to the changes in the long term weather conditions, such as the frequency of extreme weather conditions, shifts in the timing of seasons and a rise in sea level.

2.2 There are both natural and human factors which lead to global warming. Natural causes include volcanic eruptions, ocean current, earth orbital changes and solar variations. Humans influence global climate through activities which release greenhouse gases like Carbon Dioxide (CO₂), Methane (CH₄), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Nitrous Oxide (NO_x) into the atmosphere. It is an increasing concern that the climatic changes which occur today have been aggravated and hastened by human activity, which leads to the emission of these greenhouse gases. Although the earth's atmosphere comprises naturally a layer of gases, which trap some of the heat from the sun, keeping the earth at a liveable temperature, human activities appear to be increasing the amount of these greenhouse gases in the atmosphere to less stable levels, trapping more heat and causing the global temperature to increase. Most of the greenhouse gas produced in the UK is carbon dioxide (about 85% for the UK economy as a whole).

2.3 The Earth's climate has warmed by three-quarters of a degree celsius over the last 100 years, and more than half of this warming has occurred since the 1970s. Further warming is likely as a result of current levels of greenhouse gases in the atmosphere. Individuals are responsible for about 40% of greenhouse gas emissions in the UK. The biggest domestic sources are energy use in the home, road transport and air travel. Other major sources include industrial activity and related traffic. The challenge is to reduce the rate of increase in these gases and then to stabilise their levels. Ultimately, the challenge will be to reduce the levels of all greenhouse gases so that the rate of warming and the climate change they cause is within our ability to cope.

- 2.4 Because greenhouse gases stay in the atmosphere for such a long time, (CO₂ can stay for up to 200 years), whatever we do we cannot escape some climate change, but the worst effects can be avoided if the greenhouse gases in the atmosphere are stabilised instead of being allowed to increase. In order to avoid the worst impacts of climate change, many scientists agree that we must reduce our climate change gas emissions by at least 80% before 2050. The UK Government has now adopted this as the national target with an interim target of 34% reduction by 2022.
- 2.5 Climate change can be addressed through both mitigation (to cut emissions to reduce climate change in the future) and adaptation (to help us prepare for the potential future impacts of changing climate).

3. Policy Context

3.1 European Level

The United Nations Framework Convention on Climate Change (UNFCCC COP21) took place in Paris in 2015. UNFCCC is an international environmental agreement on climate change, of which there are 195 States Parties, including the UK. The following matters were agreed:

- A long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels;
- To aim to limit the increase to 1.5°C, since this would significantly reduce risks and the impacts of climate change;
- On the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries;
- To undertake rapid reductions thereafter in accordance with the best available science.

- 3.2 The meeting in Paris was hailed as a make-or-break opportunity to secure an international agreement on approaches to tackling climate change, a commitment to a longer-term goal of near zero net emissions in the second

half of the century, and supporting a transition to a clean economy and low carbon society.

- 3.3 There are three **European Directives** which are particularly relevant to climate change:
- **The European Water Framework Directive 2000** – introduces an innovative and comprehensive approach to the management of water quality.
 - **European Directive on Energy Performance of Buildings 2002**
This promotes the improvement in energy performance of buildings.
 - **European Emission Standards** define the acceptable limits for exhaust emissions of new vehicles sold in EU Member states. The emission standards are defined in a series of European Union Directives staging the progressive introduction of increasingly stringent standards.
- 3.4 Other initiatives being undertaken by the EU include:
- continually improving the energy efficiency of a wide array of equipment and household appliances
 - mandating increased use of renewable energy sources, such as wind, solar, hydro and biomass, and of renewable transport fuels, such as biofuels
 - supporting the development of carbon capture and storage (CCS) technologies to trap and store CO₂ emitted by power stations and other large installations
 - launching the European Climate Change Programme (ECCP) in 2000, which has led to the adoption of a wide range of new policies and measures, including the Emissions Trading System, the EU's key tool for reducing greenhouse gas emissions from industry cost effectively
 - developing a comprehensive EU adaptation strategy that strengthens Europe's resilience to climate change.
- 3.5 A major EU study into climate change impacts as a result of hydraulic fracturing (fracking) took place during 2012-13 and is expected to report shortly.

3.6 Brexit will not change the need to address the risks from climate change which are set in UK law. It will create both opportunities and risks and EU policies will need to be replicated or improved. Programmes to improve the resilience of the natural environment to climate change will need to be replaced with UK legislation.

National Level

3.7 The Kyoto Protocol stipulates a 5.2% reduction in greenhouse gas emissions by 2012 from 1990 levels for industrialised countries and an 8% reduction for EU countries.

3.8 The Climate Change Act 2008 established the then government's carbon reduction targets for a reduction of 37% (on 1990 levels) in greenhouse gas emissions by 2020 and of at least 80% by 2050. This implies a commensurate greenhouse gas reduction target of around 57% by 2030. The current government's Carbon Plan ² published in 2011 reflects:

- Supporting the development of carbon capture and storage (CCS) technologies to trap and store CO₂ emitted by power stations and other large installations.
- Launching the European Climate Change Programme (ECCP) in 2000, which has led to the adoption of a wide range of new policies and measures, including the Emissions Trading System, the EU's key tool for reducing greenhouse gas emissions from industry cost effectively.
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National Planning Policy Framework (NPPF)

3.9 The NPPF states that:

'planning plays a key role in helping to shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change and supporting the delivery of renewable and low carbon energy and associated infrastructure.'

² A new Carbon Plan is expected to be published shortly.

In doing this 'Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change'.

3.10 It also sets out that Local Plans should take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. It states that new development should be planned to avoid increased vulnerability to the range of impacts from climate change. It also sets out that where new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.

3.11 National Planning Practice Guidance sets out that effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases. In doing so, local planning authorities should ensure that protecting the local environment is properly considered alongside the broader issues of protecting the global environment. Planning can also help increase resilience to climate change impact through the location, mix and design of development.

4. What About Climate Change in Derbyshire and Derby

4.1 The Councils within Derbyshire and Derby recognise their responsibilities to reduce carbon emissions and play an active part in the global effort to reduce greenhouse gas emissions and avoid and adapt to the most severe consequences of climate change.

Derbyshire County Council

4.2 Derbyshire County Council works with a wide range of organisations across the County and beyond to reduce greenhouse gases produced and to adapt to a changing climate. This process was formalised in the Derbyshire Climate

Change Charter 2014-2019 adopted in 2014³. The Council also works to reduce the emissions from its own estate and operations through its Environment Policy where it has adopted targets to reduce greenhouse gas emissions which are in line with national targets. The policy is wider than this and commits the Council to putting the principles of sustainable development into action in everything it does.

Derby City Council

4.3 Derby's Climate Change Strategy was published in 2014. It includes the following aims:

- To raise the profile and understanding of how Derby can respond proactively to climate change.
- To develop a shared vision for Derby about this critically important issue.
- To recognise and build on the strengths of the city while identifying the gaps that exist in tackling this complex and challenging issue.
- To promote long term, integrated planning across different disciplines and organisations to help manage the city's response to climate change.

High Peak Borough Council

4.4 The Council commissioned the Peak Sub-Region Climate Change Study jointly with Derbyshire Dales District Council in 2009 to inform its Local Plan Review. The study has been produced by National Energy Foundation to assess the capacity of the Peak Sub-Region to accommodate renewable energy generation.

4.5 The study considers the capacity and potential for an energy supply derived from renewables and low carbon technologies across the Peak Sub-Region. It has been prepared in conjunction with a landscape sensitivity study and so evaluates the impact of renewable energy technologies, such as wind turbines in the Peak Sub-Region landscape.

³ https://www.derbyshire.gov.uk/images/Climate%20Change%20Charter%20final_tcm44-256206.pdf

Bolsover District Council

Climate Change Strategy

- 4.6 'We will identify where adoption of climate change objectives could help to deliver our existing Sustainable Community Strategy and Corporate Plan objectives and targets and any supporting plans and programme targets.
- 4.7 We will undertake an investigation of the potential sites for stand-alone renewable energy installations within the District and take steps to realise this potential where appropriate.
- 4.8 We will raise awareness and understanding of climate change throughout the community and seek to create the capacity to take action to mitigate and adapt to climate change.'

South Derbyshire District Council

- 4.9 The Council is a signatory to The Climate Local Commitment.

Erewash Borough Council

- 4.10 Erewash Borough Council is committed in tackling the causes of climate change through reduced energy use and sustainable transport. The Council has a key role of leading by example, reducing its own emissions and raising awareness and encouraging behaviour change. The Natural Resources Strategy secures the Councils commitment to Climate Local which was signed by the Council on 28 March 2013 and sets out how Erewash Borough Council will minimise its longer term impact on natural resources.
- 4.11 The Council's Core Strategy Draft Policy on climate change states that 'All development proposals will be expected to deliver high levels of building sustainability, in advance of national standards where viable and achievable, in order to mitigate against and adapt to climate change.'

Amber Valley Borough Council

4.12 The Core Strategy topic paper states that 'there is no robust policy that specifically addresses these concerns [climate change and renewable energy]' and then refers to saved policies in the Local Plan which in turn refer to efforts to reduce local contributions.

Derbyshire Dales District Council

4.13 Derbyshire Dales District Council has reference to the Peak Sub-Region Climate Change Study undertaken in 2009 as a background study to inform its Local Plan Review. This 'considers the capacity and potential for decentralised energy supply from renewables and low carbon technologies across the Peak Sub-Region'.

North East Derbyshire District Council

4.14 North East Derbyshire District Council has prepared a background paper to its emerging Local Plan, 'Sustainable Development and Communities' which includes a chapter on Climate Change. It provides information on ways in which new buildings can be more sustainable, save energy and be adaptable to changes in weather patterns.

Chesterfield Borough Council

4.15 Chesterfield Borough Council has policies on reducing the impacts of, and adapting to, climate change in its Core Strategy Local Plan (2013).

5. Addressing The Impacts of Climate Change Through Minerals Planning

5.1 Minerals planning can seek to address the issue of climate change in the following ways:

- Reducing carbon emissions (mitigation).
- Preparing for and adapting to the effects of climate change (adaptation).

Reducing Carbon Emissions

5.2 Some aspects of mineral development, particularly the processing of minerals, can produce significant greenhouse gas emissions. These will vary depending

on the minerals involved and the ways in which they are processed. It is likely also that vehicular emissions, both on site from the extraction process and off site, as a result of transportation of the mineral to markets, will be a significant factor.

- 5.3 The 'Mining and Quarrying industry accounted for just over 3% of UK carbon dioxide emissions in 2011 (UK Environmental Accounts, 2013). Coal, oil and gas extraction are by far the major contributors to carbon dioxide emissions of this sector. The majority of these emissions take place offshore. Whilst the emission of carbon dioxides for the UK economy as a whole has fallen by 13% since 1990, emissions from Mining and Quarrying are still around the 1990 levels, although this masks an increase up to 2002 followed by a decline thereafter. This is believed to reflect the corresponding rise and fall in offshore oil and gas production. In contrast, emissions from the onshore section of the industry experienced a reduction in emissions of 60%. For overall greenhouse gas emissions (including methane) onshore Mining and Quarrying emissions declined by 85% during this period, largely due to the contraction in the coal industry.
- 5.4 There are many reasons for the decline in UK carbon dioxide emissions; the replacement of coal by gas in electricity generation being an important one. However, the increasing dependency on mineral imports, particularly coal and mineral based manufacturing products, means that the UK has exported a proportion of those emissions overseas, with this figure rising each year. Overall the UK's consumption-based greenhouse gas emissions (i.e. including imports and embodied carbon added through their transport to the UK) have far exceeded the UK's territorial emissions. Energy intensive, yet energy efficient sectors are increasingly citing energy costs as a reason for moving activities overseas.
- 5.5 In 2009, the UK aggregate sector alone consumed 705,000 MWh of electricity and 4,300,000 MWh of fuel emitting 1.2 million tonnes of CO₂ and in 2011 the minerals industry accounted for 10% of all industrial energy consumption in the

UK⁴. However energy demands differ significantly depending on the material in question.

- 5.6 Research undertaken by the Carbon Trust⁵ looks at energy consumption across a variety of quarries and mineral workings at different scales. This research indicated that economies of scale can have benefits for energy performance; however it also found that some small sites had achieved energy performance levels which matched the larger ones and there is therefore also potential for small sites to become very efficient.
- 5.7 The research considered the energy consumption and therefore CO₂ saving that could be made across the sector if all sites operated at a good practice benchmark.⁶
- 5.8 The findings suggest that energy efficiency improvements to meet good practice levels could deliver an 8.4% reduction in energy consumption across the sector, with potential for greater savings if all sites had energy performance levels which were equivalent to the sector leaders. Across the industry there are examples of such improvements being achieved, with Tarmac seeing a 17% reduction in energy consumption between 2004 and 2010 and setting a target for a 25% reduction from 2004 levels by 2014⁷ and Wienerberger seeing a 10% reduction in energy consumption⁸ between 2000 and 2010.
- 5.9 Energy reductions can be made from simple measures such as maintaining equipment or turning it off when it is not in use, each of which can reduce energy demand by up to 10%. It may also be appropriate to consider how greater energy efficiency can be achieved through adapting processes, procedure and plant.

⁴ Carbon Trust (2011) Aggregate Energy Consumption Guide: Summary Report

⁵ Carbon Trust (2011) Aggregate Energy Consumption Guide: Summary Report

⁶ The good practice benchmark is set as the upper quartile of performance.

⁷ Tarmac Annual Report 2011

⁸ Specific Energy Consumption: Energy used per unit of production.

- 5.10 In preparing the Derbyshire and Derby Minerals Local Plan, the potential to reduce harmful emissions will be considered, both in terms of where site allocations are proposed and the formulation of policies which will manage how future mineral related development takes place.
- 5.11 In accordance with sustainability principles, it will be important to seek to allocate new sites for mineral working in locations where the distances which the minerals will be transported is minimised. This will help to reduce emissions of harmful gases.
- 5.12 Developments can help to reduce greenhouse gas emissions through the careful design, construction and operation of facilities, enabling energy efficient low carbon schemes for the winning and working minerals. Measures could include use of sustainable transport or low emission vehicles and use of renewable sources to power the facility. There will be a clear benefit of using local supplies of minerals which reduce the impact of transporting minerals over long distances by road and thereby reducing carbon emissions.
- 5.13 Greater use of recycled aggregates will be encouraged through the Minerals Local Plan. If minerals are not reused or recycled, then primary resources have to be extracted and new products manufactured which results in the use of additional energy. Also, recycling and re-use of construction and demolition material on site reduces transportation; an important consideration, given that they are bulky and heavy to transport.

Preparing for and Adapting to the Effects of Climate Change

- 5.14 Mineral operations can provide opportunities to increase our resilience to climate change. For example, restoration schemes for sand and gravel quarries (which because of where the mineral is found have to operate in the flood plains of the river valleys) could be tailored to contribute towards reducing the risk and scale of flooding using the extraction area next to the river for river braiding or widening or to provide increased capacity for flood water storage.

- 5.15 Wildlife corridors can be enhanced to improve the resilience of the natural environment to climate change, for example, increased vegetation will absorb greater quantities of carbon and will also help to reduce soil erosion during heavy rain and flooding by the roots binding the soil. Vegetation also reduces water run off by holding and absorbing water, helping to reduce the severity of flooding.
- 5.16 There is also a need to take advantage of the benefits which the natural environment can have in removing CO₂ from the atmosphere. Particularly important in this respect is the creation and protection of green infrastructure including wildlife habitats and areas of biodiversity. These can also act as 'carbon sinks' to reduce the amount of CO₂ that is absorbed into the atmosphere.
- 5.17 Other measures include providing opportunities for the provision of winter water storage in reclaiming quarries and ensuring that reclamation schemes take into account the effect of climate change and where appropriate, provide opportunities for the creation of habitat for species affected by climate change. The growing of biomass energy crops to replace use of fossil fuels could also be encouraged as a possible after-use on mineral sites.
- 5.18 The use of sustainable drainage systems and water efficiency should also be encouraged at mineral operations.
- 5.19 The potential role of the Minerals Local Plan in climate change adaptation will depend on the nature of the changes to climate that are likely to be experienced in Derby and Derbyshire and the areas where mineral working is likely to take place. This will also need to be balanced against other objectives. However, the option of directing development to areas where there is the greatest potential to contribute to climate change adaptation will need to be considered in detail and consulted on during the development of the emerging Minerals Local Plan.