

DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

**Towards a Minerals Local Plan:
Winter 2021/2022 Consultation
Proposed Draft Plan**

**Background Paper
Climate Change**

December 2021

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1. Introduction

- 1.1 Climate change refers to long lasting changes in global climate and particularly those that we have seen in the last few decades, attributed to the rapid increase in global temperatures, caused largely by increased levels of atmospheric carbon dioxide produced by the use of fossil fuels. Global warming is the biggest threat to human society and therefore, in 2015, 195 Governments signed the Paris Agreement committing to keeping a global temperature rise this century well below 2°C above pre-industrial levels and pursuing efforts to limit the increase even further to 1.5°C, a limit that is now close to being breached . In order to limit global warming to 2°C it has been calculated the world can only emit a certain quantity of carbon dioxide to the atmosphere. This is the global carbon budget which is then divided amongst individual countries according to the Paris Agreement. The UK is committed to achieving its carbon budget and has committed in law to achieve net-zero carbon emissions by 2050¹ with an interim target of 78% reduction by 2035².
- 1.2 The climate has never been static, with natural fluctuations taking place constantly. 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 more intense rainfall events, hotter summers and warmer but wetter winters. Globally, the 10 warmest years on record have all occurred since 1998. In the UK, all of the ten warmest years on record have occurred since 2002 ,rainfall has increased by 5% and sunshine by 7%³ . The impacts of these changes on Derbyshire and Derby include an increased risk of flooding, heatwaves, droughts and damage to infrastructure. A changing climate also harms wildlife and precious ecosystems. There is now overwhelming scientific consensus that human activity is driving climate change

¹ The Climate Change Act 2008 (2050 Target Amendment) Order 2019

² The Carbon Budget Order SI 2021 No.750

³ UK Met Office Statistics 2018

and that urgent action is required to limit our impact if significant climate change, economic and geo-political consequences are to be avoided.

- 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 4% of UK greenhouse gas emissions in 2019.⁴
- 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 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 changes in the average temperature, rainfall, the frequency of extreme weather conditions and shifts in the timing of seasons.

⁴ DBEIS UK Environmental Accounts, 2019

- 2.2 There are both natural and human factors which can contribute to global warming. Natural causes include volcanic eruptions, changes to the ocean currents, the orbit of the earth 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 Oxides (NO_x) into the atmosphere. Scientific evidence indicates that the climatic changes which occur today have been largely caused by human activities emitting these greenhouse gases. Although the earth's atmosphere naturally comprises of a layer of gases which trap some of the heat from the sun, keeping the earth at a liveable temperature, human activities are increasing the amount of these greenhouse gases in the atmosphere, trapping more heat and causing the global temperature to increase. Atmospheric Carbon Dioxide concentrations have nearly doubled since the start of the industrial revolution.
- 2.3 Recent statistics issued by the DBEIS⁵ suggest that carbon dioxide accounted for 80% of greenhouse gas emissions in the UK in 2019 with the remainder made up of methane 12%, nitrous oxide 5% and fluorinated gases 3%. In 2019 UK territorial greenhouse gas emissions fell 3% from 2018 to 2019 and were 44% lower than in 1990. Transport remains the largest emitting sector at 27%, Energy Supply 21%, Industry 17%, Residential 15%, and Agriculture 10% with the remainder 9%. Of the emissions allocated to industry the largest source was cement production, with other processes such as sinter, lime and iron and steel production also contributing significantly.
- 2.4 The Earth's climate has warmed by more than 1 degree Celsius over the last 100 years (World Meteorological Organisation 2019), and more than half of this warming has occurred in the past 35 years. Further warming is predicted as a result of greenhouse gases already in the atmosphere, with UK summer temperatures potentially being 3.3 degrees warmer by the end of the century. Individuals are responsible for about 40% of greenhouse gas emissions in the UK, the biggest domestic sources being energy use in the home, road transport

⁵ DBEIS 2019 UK Greenhouse gas emissions, February 2021

and air travel. Other major sources include agriculture and land use change, industrial activity and related traffic. The challenge is now to reduce the rate of increase of these gases and ultimately, to achieve net zero greenhouse gas emissions by 2050 so that the rate of warming and the climate change they cause is within our ability to cope.

2.5 Because greenhouse gases stay in the atmosphere for such a long time, (CO₂ persists for up to 200 years), whatever we do we cannot escape some climate change, but the worst effects can be avoided if the levels of greenhouse gases in the atmosphere are stabilised and reduced instead of being allowed to increase. By limiting global temperature rise to as little as possible above 2°C we can avoid the worst impacts of climate change. The UK government has therefore adopted a target of achieving net zero greenhouse gas emissions before 2050 with an interim target of 78% reduction by 2035. These targets have been set in the Climate Change Act 2008 and amendments.

2.6 While it is clear that the legally binding targets of the Climate Change Act will contribute to the mitigation of the causes of climate change, the need for significant adaptation measures cannot be avoided. The planning system, and the development plans and national policies which drive planning, can and must play a part in ensuring that the development necessary in the coming decades will contribute to both the mitigation of climate change and adaptation to the risks which it will bring.

3. Policy Context

International Legislation and Policy

3.1 The United Nations Framework Convention on Climate Change (UNFCCC) or Rio Summit adopted in June 1992 established the objective to stabilise Greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The convention set non-binding limits of GHG emissions for individual countries and established a framework for the introduction of legally binding 'protocols' to set out how the UNFCCC objectives could be achieved.

- 3.2 The UNFCCC Kyoto Protocol was adopted by 192 parties, including all but 4 United Nations member states, in December 1997. The protocol introduced a commitment to reducing the atmospheric concentration of 6 GHGs, Carbon dioxide, Methane, Nitrous oxide, Hydrofluorocarbons, Perfluorocarbons and Sulphur hexafluoride. The protocol sets binding targets for the reduction of GHGs over a number of commitment periods.
- 3.3 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.
- 3.4 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. The Paris Agreement requires individual countries to submit Nationally Determined Contributions (every 5 years) to the UNFCCC committing to reducing greenhouse gas emissions and Adaptation Communication setting out actions on adaptation and resilience. It should be noted that although the Paris agreement recognised the need for emissions to peak as soon as possible, emissions are expected to rebound by about 4.8% in 2021 following a 5.8% drop due to the Covid 19 pandemic in 2020.

- 3.5 COP26 held in November 2021 aimed to ensure that countries near term commitments for GHG emissions reductions were ambitious enough to achieve the Paris Agreement targets. 153 Countries have agreed new 2030 emission targets, to meet next year to strengthen commitments, including a move away from the unabated use of coal, halting and reversing deforestation, reducing methane emissions and speeding the switch to electric vehicles. 45 countries submitted adaptation plans with a record amount of adaptation finance being agreed globally.

National Legislation and Policy

Climate Change Act 2008 and Amendment

- 3.6 The Climate Change Act 2008 sets a framework for the UK to reduce GHG emissions and build capacity to adapt and strengthen resilience to climate change. It established the Climate Change and Adaptation Committee an independent statutory body whose role it is to advise the UK governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change.
- 3.7 The Act originally committed the UK to cut its emissions by at least 80% below the 1990 baseline level by 2050. Following the declaration of a climate change emergency, this target was amended, on 27 June 2019⁶, committing the UK to a legally binding target of net zero emissions by 2050, set on a whole-economy basis with an interim target of a 57% reduction by 2030. (For carbon dioxide, methane and nitrous oxide the baseline is 1990. For hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride the base year is 1995.) This interim target has been amended further to require a 78% reduction by 2035.
- 3.8 The Climate Change Act 2008 also introduced legally binding 'carbon budgets' which cap emissions over successive 5-year periods which must be set 12 years in advance to allow, policy makers, businesses and individuals enough

⁶ The Climate Change Act 2008 (2050 Target Amendment) order 2019

time to prepare. The first five carbon budgets cover the period 2008-2032. The UK is currently in the third carbon budget period with the sixth carbon budget (2033-2037) due to be legislated by mid-2021. The table below shows the progress made to date:

Budget	Carbon Budget Level MtCO₂e	Reduction below 1990 levels	Met?
1 st budget (2008-2012)	3,018	25%	Yes
2 nd budget (2013-2017)	2,782	31%	Yes
3 rd budget (2018-2022)	2,544	37% by 2020	On track
4 th budget (2023-2027)	1950	51% by 2025	Off track
5 th budget (2028-2032)	1725	57% by 2030	Off track
6 th budget (2033-2037)	965	78% by 2035	Off track
Net Zero Target		At least 100% by 2050	

- 3.9 The Climate Change Act 2008 also requires the government:
- to assess regularly, on a five-yearly cycle, the risks to the UK of the current and predicted impact of climate change;
 - to set out its climate change adaptation objectives; and
 - to set out its proposals and policies for meeting these objectives.

3.10 These requirements are fulfilled by the UK climate change risk assessment and the national adaptation programme report respectively. The most recent UK

Climate Change Risk Assessment Report, January 2022 sets out eight priority areas needing urgent further action over the next five years whilst the most recent National Adaptation Programme Report, 2018 sets out the Government's response to the risks identified in the Climate Change Risk Assessment Report 2017 based on the those six themes. The six priority areas are:

- Flooding and coastal change risks to communities, businesses and infrastructure;
- Risks to health, well-being and productivity from high temperatures;
- Risk of shortages in the public water supply and for agriculture, energy generation and industry;
- Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity;
- Risks to domestic and international food production and trade;
- New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals.

The Government is committed to developing a third National Adaptation Programme for England, setting out how

The Planning and Compulsory Purchase Act 2004

- 3.11 The Planning and Compulsory Purchase Act 2004 Section 19(1A) (as amended by section 182 of the Planning Act 2008) requires that local plans include policies designed to secure that, the development and use of land in a local planning authority's area, contribute to the mitigation of, and adaptation to, climate change.

Town and Country Planning: General Permitted Development Order 2015

- 3.12 In most cases the installation of small-scale renewable energy equipment, including heat pumps, solar thermal and solar PV is permitted development subject to certain limits including not extending beyond 0.2m from the roof face or being higher than the roof line. In relation to listed buildings, scheduled

monuments, conservation areas and world heritage sites, the installation of such equipment is not permitted development, however, the benefits of the installation of small-scale renewables should be weighed carefully against the harm to a conservation area or the setting of a listed building.

National Planning Policy Framework (NPPF)

- 3.13 The NPPF⁷ states that ‘The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.’
- 3.14 Local Plans are required to adopt a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.
- 3.15 It⁸ 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.

⁷ NPPF July 2021, Paragraph 152

⁸ NPPF July 2021, Paragraph 153

Planning Practice Guidance

3.16 Planning Practice Guidance⁹ 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.

Other Government reports and strategies

3.17 The UK Government has published a number of other reports and strategies aimed at addressing climate change issues; these include:

- **UK Clean Growth Strategy 2017** – planning for the UK’s economy to grow whilst still reducing greenhouse gas emissions;
- **UK 25 Year Environment Plan (YEP) 2018** – improving our environment over a generation, leading to Environment Bill with commitment to bring forward legally binding targets on air quality, biodiversity, water and resource efficiency and waste reduction by October 2022 to support achievement of the net zero emissions target of 2050;
- **UK The Road to Zero: Next steps towards cleaner road transport and delivering our industrial strategy 2018** – sets out UK’s approach to tackling greenhouse gas emissions;
- **UK Clean Air Strategy 2019** - sets out plans for dealing with all sources of air pollution making our air healthier to breathe, protecting nature and boosting the economy;
- **UK Ten Point Plan for a green industrial revolution 2020** - Spanning clean energy, buildings, transport, nature and innovative technologies, the plan will mobilise £12 billion of government investment to create and

⁹ PPG Climate Change 2019 Paragraph: 001 Reference ID: 6-001-20140306 Revision date: 06 03 2014

support up to 250,000 highly-skilled green jobs in the UK, and unlock three times as much private sector investment by 2030;

- **UK Energy White Paper Powering our Net Zero Future December 2020** - establishes the goal of a decisive shift from fossil fuels to clean energy in power, buildings and industry consistent with net zero emissions by 2050;
- **UK Industrial Decarbonisation Strategy March 2021** - shows how the UK can have a thriving industrial sector aligned with the net zero target, without pushing emissions and business abroad, and how government will act to support this;
- **Draft National Policy Statements for Energy September 2021** - The policy documents set out the case for an urgent need for offshore wind, solar PV, wave, tidal range, tidal stream, energy from waste, natural gas, low carbon hydrogen, small modular, advanced modular and large scale nuclear reactors as well as fusion power plants. Natural gas and other combustion plants, including energy from waste and biomass will still be required to meet peak demand periods, but will operate with carbon capture, utilisation and storage to reduce their GHG emissions.
- **Hydrogen Strategy 2021** - Hydrogen is one of a handful of new, low carbon solutions that will be critical for the UK's transition to net zero. As part of a deeply decarbonised, renewable energy system, low carbon hydrogen could be a versatile replacement for high-carbon fuels used today – helping to bring down emissions in UK industrial sectors and providing flexible energy for power, heat and transport. The UK Hydrogen Strategy sets out how the country will drive progress in the 2020s, to deliver a 5GW production ambition by 2030 and position hydrogen to help meet the Sixth Carbon Budget and net zero commitments.

The UK Hydrogen Strategy includes the promotion of both Blue and Green hydrogen. Blue H₂, produced from natural gas, is seen as a bridge to a truly low carbon source of energy although it has the disadvantage of having the potential to create greater CO₂ emissions

per kWh of energy than simply burning the natural gas unless it is linked to an effective carbon capture and storage system. Future green H₂, from the electrolysis of water using wind or solar power, will replace blue H₂ as the grid further decarbonises.

- **Future Buildings Standard 2021** - The aim of the Future Buildings Standard is to improve energy efficiency in new and renovated buildings while ensuring that the design and construction is sustainable. It applies to all types of non-domestic buildings including residential uses such as care homes and halls of residence. The standard intends to deliver highly efficient non-domestic buildings using low carbon heat and future proofed against potential over heating without the need for energy intensive air conditioning systems.

Like the Future Homes Standard, the Future Buildings Standard will come into force from 2025 but includes an interim uplift in buildings regulations applicable from 2021, increasing energy efficiency standards and introducing a 'fabric first' approach to energy efficiency. This is intended to encourage the phase out of fossil fuelled heating systems.

Rather than banning specified technologies, the Future Buildings Standard will set performance-based standards. It is however unlikely that the new standards will be met without the introduction of low carbon technologies.

- **Net Zero Strategy: Build Back Better - October 2021** - The strategy identifies a series of policies and proposals to deliver a pathway to emissions reductions meeting the targets of the 6th carbon budget (to 2037) and ultimately toward the net zero target of 2050. The key policies for power generation are for the decarbonisation of electricity supply by 2035, to increase the supply of renewable energy and by 2030 to secure 40GW of additional offshore wind capacity, to secure an investment decision on a large-scale nuclear power plant by the end of the current

parliament, launch a new Future Nuclear Enabling Fund to further the development of small modular nuclear reactors, and the deployment of flexibility measures to assist in smoothing of energy price spikes. In relation to fuel supply the main themes are industrial decarbonisation through the Industrial Decarbonisation and Hydrogen Revenue Support scheme (IDHRS) to fund new hydrogen generation and carbon capture business models.

- **The Environment Act 2021** - seeks to improve the protection of the natural environment including emissions to air, land and water, the protection and recovery of biodiversity and the regulation of waste and resource efficiency. These aims have considerable overlap with climate change adaptation and mitigation in areas such as flood prevention and carbon sequestration or offsetting.

4. Climate Change in Derbyshire and Derby

- 4.1 The Government has allocated the UK carbon budget amongst local authority areas. In September 2019, local carbon budgets were made available at district, borough and unitary authority level relative to existing practices in their respective areas. Budgets have been aggregated to produce a carbon budget for the County Council administrative area as well. The carbon budget for High Peak is notably higher than the other local authorities primarily due to the location of two carbon intensive cement plants at Hope and Tunstead.
- 4.2 The Councils within Derbyshire and Derby recognise their responsibilities to reduce carbon emissions to meet their carbon budgets 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

- 4.3 Derbyshire County Council works with a wide range of organisations across the County and beyond to reduce greenhouse gas emissions from its own estate, and from the county as a whole, to adapt to, and mitigate the impacts of a changing climate. This process was formalised in the Derbyshire Climate and

Carbon Reduction Manifesto (May 2019) which consists of a series of carbon reduction pledges. The Derbyshire Environment and Climate Change Framework (Oct 2019) seeks to reduce greenhouse gas emissions to levels which are consistent with the allocated carbon budgets for Derbyshire and to reduce carbon emissions to net zero by 2050. The Derbyshire County Council Carbon Reduction Plan (Oct 2019) requires the County Council to reduce greenhouse gas emissions from its own estate and operations with the aim of having net zero greenhouse gas emissions by 2032. It sets out that the Council will lead the way on tackling greenhouse gas emissions by using its influence and role as a community leader to work with partners, businesses and communities to tackle climate change through a common framework for action across the county and by getting its own house in order by reducing the emissions from its own estate and operations to net zero greenhouse gas emissions. This Plan sets out the actions the Council will undertake to reduce emissions from its own operations to net zero.

Derby City Council

4.4 In May 2019 the City Council declared a Climate Emergency. The Council is to establish a Climate Change working group to recommend actions for Derby to become carbon neutral. The Council'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.

The Derby City Local Plan Part One Core Strategy, adopted January 2017, has two objectives which relate to climate change - the first is to reduce Derby's impact on climate change through promoting more sustainable forms of

development, low carbon technologies, renewable forms of energy, recycling, careful use of resources and minimising waste. The second is to enhance the role of Derby's green wedges in recognition of, amongst other things, their contribution to adapting to climate change.

Amber Valley Borough Council

- 4.5 The Council agreed to declare a climate emergency in July 2019, committing to work with partners to deliver the goal of becoming carbon neutral by 2030 through all relevant strategies and to include strong references in their proposed new Local Plan.

Bolsover District Council

The Council has published a Climate Change Strategy which states that:

- 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.'
- 4.9 The Bolsover Local Plan, adopted in March 2020, has climate change mitigation and adaptation as one of the key objectives of the Plan. It seeks to mitigate against and adapt to the impacts of climate change through
- a) The increased use of renewable energy resources
 - b) Energy reduction to minimise pollution including greenhouse gas emissions
 - c) Minimising carbon emissions in new development

- d) Promoting sustainable design that takes account of more extreme weather patterns and reduces the demands placed upon ecosystem services
- e) Avoiding inappropriate development in flood risk areas
- f) Promoting the efficient use of water resources, and water efficiency measures in new development to reduce the demand placed on water resources
- g) Protecting and supporting the ability of wildlife to respond and adapt to change
- h) Protecting, enhancing, extending, and the better integration of, green infrastructure and ecological networks.

Chesterfield Borough Council

- 4.10 Chesterfield Borough Council declared a climate change emergency in July 2019. The Council's local plan, adopted in 2020, includes as its first strategic objective to "minimise greenhouse gas emissions in line with Government targets, increase the use of renewable energy and help the borough adapt to the effects of climate change."

Derbyshire Dales District Council

- 4.11 Derbyshire Dales District Council used the Peak Sub-Region Climate Change Study undertaken in 2009, updated in 2011, as a background study to inform its Local Plan Review; the approach in the Local Plan being to reflect the energy hierarchy: use less, use it efficiently, use renewables, use low emission energy sources and finally the last option, use conventional, higher carbon sources.
- 4.12 The Local Plan adopted in 2017 includes policy PD7 on climate change which through which the Council to promotes a development strategy that seeks to mitigate global warming, adapts to climate change and respects our environmental limits. The Council published a supplementary planning document on Climate Change in 2021.

Erewash Borough Council

- 4.13 Erewash Borough Council is committed in tackling issue of climate change. In 2019 the Council passed the following motion, 'This Council notes: that the impacts of climate breakdown are already causing serious damage around the world and here at home in Erewash; that all levels of Government have a responsibility to act now and we note Government plans for net-zero emissions by 2050; that strong well thought-out policies to cut emissions also have associated health, wellbeing and economic benefits. This Council will: have net-zero carbon emissions by 2050; Seek to use our planning and building control power to make new homes more energy efficient; Seek to support and work with other relevant agencies towards making the entire area net-zero carbon within the same timescale; Call on the UK Government to provide the powers, resources and help to make this possible; Seek to increase the number and size of land designated as nature reserves and improve and create habitats to support insect life including bees; Encourage and support tree and hedge planting within Erewash and support the transition away from petrol and diesel cars.'
- 4.14 The Council's Adopted Core Strategy, adopted 2014, includes Policy 1 which requires that, 'all development proposals will expected to mitigate and adapt to climate change, and to comply with national targets on reducing carbon emissions and energy use.'

High Peak Borough Council

- 4.15 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.
- 4.16 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. The Local Plan, adopted in 2016, contains

a policy on climate change through which the Council commit to adopting strategies to mitigate and adapt to climate change.

North East Derbyshire District Council

- 4.17 North East Derbyshire District Council declared a climate change emergency in July 2019. It prepared a background paper to its emerging Local Plan, 'Sustainable Development and Communities' which included a chapter on Climate Change. It provides information on ways in which new buildings can be more sustainable, save energy and how to be adaptable to changes in weather patterns.
- 4.18 The Publication Draft Plan 2018 includes climate change as a central objective and includes policies regarding energy generation and environmental sustainability.

South Derbyshire District Council

- 4.19 South Derbyshire declared a climate emergency in 2019 and through the implementation of its Climate and Environment Strategy published in 2020 it seeks to ensure that all Council decisions consider and respond to the potential impact that they will have on the climate and wider environment. The adopted South Derbyshire Local Plan through Objective 1 seeks to ensure that future development addresses the causes and effects of climate change.

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 The extraction of minerals, processing and transport to market all generate carbon emissions although the level of emissions will depend on the method of extraction, the way in which they are processed and transport requirements. For example, the processing of industrial minerals is particularly energy intensive with fuel and electricity required to heat kilns and operate plant. Cement manufacture is a very carbon intensive use of minerals.

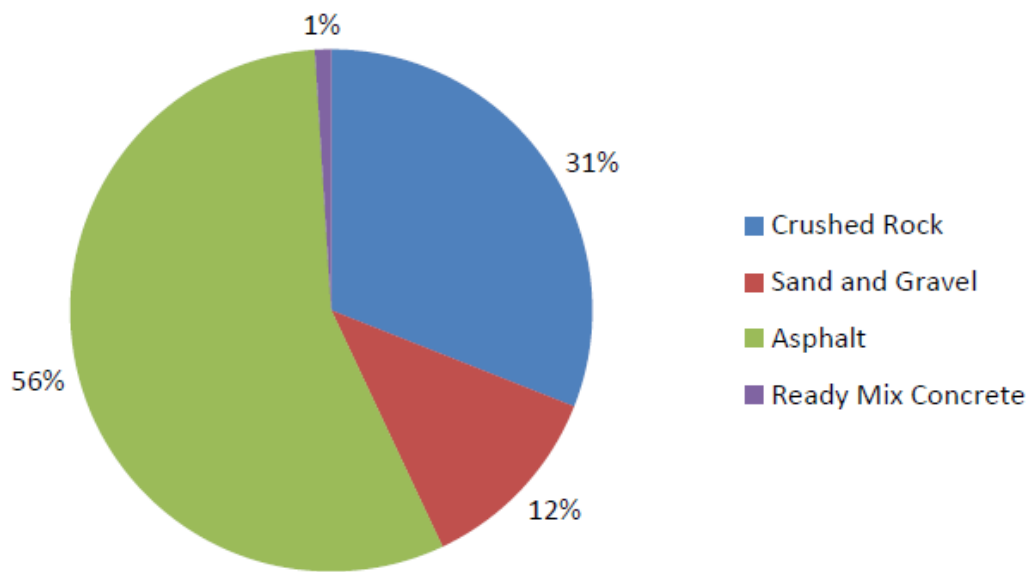
Energy Efficiency

5.3 The extraction and processing of minerals involves extraction machinery and processing plant and can be energy intensive. In 2019 the mining and quarrying sector (not including transport) in the UK consumed energy from fossil fuels equivalent to 6.5 million tonnes of oil equivalent, and emitted almost 20 million tonnes of CO₂.¹⁰ Figure 5.1¹¹ depicts industrial consumption of energy by sub sector from 1990 to 2019 which shows that, behind 'iron and steel', the UK's industrial sub-sector with the largest year-on-year decrease in energy consumption was the 'mineral products' sector (including mining and quarrying). Nevertheless, the scale of energy use means that it is important for the minerals industry to increase energy efficiency. Energy demands vary considerably depending on the mineral in question. Figure 5.2 illustrates the proportion of energy consumed during the extraction and processing of different types of aggregates.

¹⁰ ONS UK Environmental Accounts 2021 Estimates of oil and gas reserves, energy consumption, atmospheric emissions and material flows.

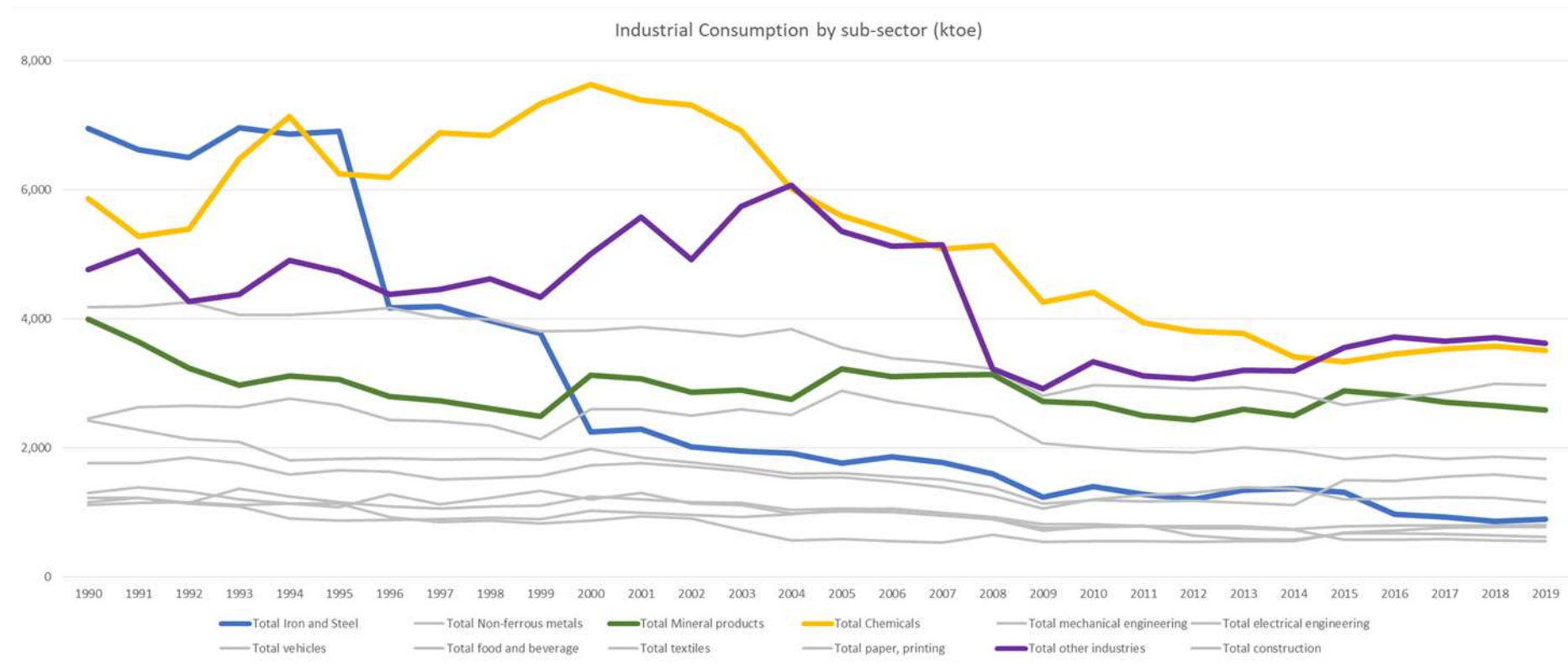
¹¹ DBEIS Energy Consumption in the UK (ECUK) 1970 -2019

Figure 5.2 Energy Consumption by product (aggregates)



Source: Carbon Trust (2011) Aggregate Energy Consumption Guide based on 2009 data

Figure 5.1 Energy consumption by sub sector 1990 - 2019



5.4 Research undertaken by the Carbon Trust¹² 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 confirming there is also potential for small sites to become very efficient. 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 benchmark¹³ as shown in Figure 5.3.

Figure 5.3 Average and good practice, CO₂ emissions and energy consumption by sector: potential savings

Sector	Production (million tonnes)	Average CO ₂ emissions per tonne (kgCO ₂ /t)	Average Energy consumption per tonne (kWh/t)	Good practice benchmark consumption per tonne (kWh/t)	Potential energy saving across sector	Carbon saving across sector if achieved (t CO ₂)
Crushed rock	105.5	4.6	14.2	10.6	17%	27,000
Sand and Gravel	46	4.0	11.7	8.4	27%	24,000
Asphalt	20.5	34.9	117.6	102.6	10%	40,500
Ready-mix Concrete	34.2	0.95	1.9	1.1	46%	8,800

Source: Collated from information in Carbon Trust Report (2011) Aggregate Energy Consumption Guide Summary Report

5.5 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 23.5% reduction in CO₂ per tonne of product since 1990 and setting a milestone

¹² Carbon Trust (2011) Aggregate Energy Consumption Guide: Summary Report

¹³ The good practice benchmark is set as the upper quartile of performance.

to achieve a 30% reduction in CO₂ per tonne of product compared to 1990 levels.¹⁴ In 2019, Wienerberger achieved a 13% reduction in specific energy consumption for brick and tile production compared to 2010.¹⁵

- 5.6 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%¹⁶. It may also be appropriate to consider how greater energy efficiency can be achieved through adapting processes, procedure and plant.

Use of renewable and low carbon energy

- 5.7 The use of renewable and low carbon energy can help reduce carbon emissions. Renewables account for around 43% of UK electricity generation, de-carbonising the grid will therefore require more than a doubling of our renewables supply. However, this accounts only for electricity supply. If, transport, gas and oil for domestic, commercial and industrial purposes are included, renewable account for only 17% of the UK energy consumption.
- 5.8 In 2019 the mineral products industry (including mining and quarrying), excluding transport, accounted for 12% of industrial fuel consumption in the UK, of this 47% was from Natural Gas, 20% electricity, 15% coal and 10% bioenergy and waste. Since the turn of the century fuel consumption by the minerals product sector has decreased by some 16%; in 2001 coal accounted for 26% of consumption, fuel from bioenergy and waste has only been consumed since 2015¹⁷.
- 5.9 Key factors in the potential for using renewable and low carbon energy at mineral operations are the scale, location and anticipated life of workings. Many of the limestone quarries within the plan area are large scale and long term and a number of them are involved in processing industrial minerals which can be

¹⁴ Tarmac Website Climate Change 2021

¹⁵ Wienerberger Website Sustainability Update 2019

¹⁶ MPrA Website Resources Carbon Trust A Well Oiled Machine and Switch It Off

¹⁷ DBEIS Digest of UK Energy Statistics (DUKES) 2019

particularly energy intensive. In these cases the potential for renewable energy generation would be similar to that of any other industrial development. However, many of the limestone quarries are located in rural areas close to the PDNP and therefore the environmental impacts of such development would need to be taken into account. For shorter term operations that involve temporary buildings the potential for energy generation may be more limited, possibly to roof-mounted photovoltaic panels or similar.

- 5.10 The NPPF makes it clear that small-scale renewable or low carbon energy projects can provide a valuable contribution to cutting greenhouse gas emissions and that applicants for energy development should not be required to demonstrate the overall need for renewable or low carbon energy. Some small-scale schemes may be considered an ancillary part of a minerals working or restoration scheme, but in some cases separate planning permission might be required from the relevant district, city or borough planning authority.
- 5.11 Within the Plan area an example of the use of renewable energy is by Longcliffe Quarries at their Brassington Moor and Ryder Point quarries which consume over 1 million pounds worth of electricity a year. The majority of this power is consumed in processing limestone to produce industrial powders. The Company has invested in the construction of two 2.3MW wind turbines at Ryder point which now generate power equivalent to 85% of that consumed by all the company's electrical operations. Additionally, a 9kw solar panel and 12ke storage battery are located on the roof of the nearby head office.

Chemical Reaction Emissions - Cement Production

- 5.12 Not all aspects of carbon emissions are from energy consumption some are from 'chemical reactions' or those which cannot be engineered out of the process. For example, the production of cement clinker produces significant carbon dioxide emissions, and in 2018, it was estimated that the concrete and cement production accounted for 1.5% of UK CO₂ emissions. Of the 7.3 million tonnes of carbon dioxide produced in 2018; around 4.4 million tonnes were 'process emissions' from clinker production, 2.2 million tonnes from fuel combustion and the remainder from electricity use and transport. Significant progress has been made in reducing emissions which have decreased by 53%

since 1990. This has been achieved through a move toward using alternative waste-derived fuels and increasing the use of by-products and waste from other industries to substitute for clinker. Clinker is the principal ingredient in cement and clinker production the main source of carbon dioxide emissions. In 2018, the sector took 43% of its kiln fuel thermal input from waste derived sources, avoiding the use of just under 500,000 tonnes of coal. In addition, cement manufacturers replaced 7% of their raw materials with waste derived alternatives. Further reductions may be achieved if product and design standards allow for lower carbon cement formulations and these are adopted by the market. However, to realistically meet 'net zero' emissions from cement production by 2050 carbon capture, transport and storage will need to be technologically and economically feasible.

Reducing Transport Emissions

- 5.13 Another major contribution to emissions from the minerals industry is transport, from vehicles used on site in the extraction process and off site, for transporting the mineral to the market. Despite comprising only 5% of UK road vehicles, heavy goods vehicles (HGVs) produce 17% of greenhouse gas emissions from the surface transport sector¹⁸. The use of more sustainable modes of transport such as pipeline, conveyor, rail and water along with low carbon emission vehicles/fuels would assist in reducing carbon emissions. Currently, within the Plan area it is only the limestone quarries that are long-life and have large scale production which transport mineral by rail. Three limestone quarries are currently rail linked and a further two quarries that are resuming production intend to transport mineral by rail.

Secondary and Recycled Aggregates

- 5.14 The increased use of secondary and re-cycled aggregates helps to reduce carbon emissions. If minerals are not re-used or recycled, then more primary mineral resources have to be extracted and new products manufactured, resulting in the use of additional resources and energy. Also, the recycling and

¹⁸ Carbon Brief - Clear on Climate, 9 December 2020

re-use of construction and demolition material on site reduces the need for transporting aggregates which is a major source of carbon emissions.

Preparing for and Adapting to the Effects of Climate Change

- 5.15 The effects of climate change are experienced through more extreme and unpredictable weather conditions, which may include more intense rainfall events, hotter summers and warmer but wetter winters. The impacts of these changes on the Plan area include an increased risk of flooding, increase risk of fire and heatwaves, droughts and damage to infrastructure from an increase in storm events. A changing climate also harms wildlife and precious ecosystems. It is recognised that a certain degree of impacts of from climate change are inevitable and therefore it is important that new developments are planned to take into account adaptive measures including those to protect the natural environment and increase its resilience to change.
- 5.16 The inclusion of adaptive measures at mineral sites is important to ensure on site resilience from unexpected climatic events such as heat and drought, storm events and high winds. Climate change may particularly lead to increased and new risks of flooding within the lifetime of planned mineral developments. In principle mineral development should be located to avoid areas of vulnerability to climate change and flood risk; where this is not possible, it will need to be planned, designed and operated to avoid, reduce and manage potential flood risk from all sources over its lifetime including the risk of increasing flooding elsewhere. Mineral working can impact on water supply and groundwater and it is important that any impacts affecting the availability of water resources are appropriately assessed and mitigated. The use of sustainable drainage systems and water efficiency should be encouraged at mineral sites.
- 5.17 Mineral development does, however, provide opportunities to increase resilience to climate change through the restoration of mineral sites. Restoration schemes for sand and gravel quarries (which because of where the mineral is found often have to operate in the flood plains of the river valleys) can contribute towards reducing the risk and scale of flooding. Such schemes are most effective where they are part of an integrated approach to flood risk

management and where they include natural flood management techniques such as using the extraction area next to the river for river braiding or widening or to provide increased capacity for winter flood water storage.

- 5.18 Restoration schemes can also provide opportunities for the creation of habitats for species affected by climate change. This includes the provision of wildlife corridors and making links to the wider green infrastructure network to improve the resistance of the natural environment to climate change. From a wildlife perspective, ensuring that water is managed so that water bodies, water courses and wetlands are receiving and storing water will be essential. Creating space for flood waters can also provide new habitats for wildlife, whilst the management of habitats should try to maintain a variety of micro-habitats to include shady, cooler areas as well as more open, hotter habitats.
- 5.19 More generally restoration schemes can also increase and enhance green infrastructure providing a network of multi-functional green and blue spaces and other natural features including newly planted trees; all of which provide local and wider benefits for the climate including carbon reduction. 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. Measures to support mitigation and adaptation to climate change should be provided for on-site and included as part of the restoration scheme rather than offset elsewhere.