DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

Towards a Minerals Local Plan:

Winter 2021/2022 Consultation

Proposed Draft Plan

Background Paper
Coal and Colliery Spoil

December 2021

DERBYSHIRE County Council

Derby City Council

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Contents

1 Introduction and Background

1.1 This is one of a series of papers providing background information to accompany the preparation of the new Minerals Local Plan. The new Plan will include strategies and policies concerning the winning and working of energy minerals. This paper provides information about coal and colliery spoil.

1.2 Coal is identified as an important mineral resource in the UK[i] and has played a major role in the development of the country. It has been mined for several centuries to utilise the energy that can be obtained from its combustion and other forms of processing. That energy has been harnessed to fuel industrial development and it has also been one of the main sources of domestic heating. The abundance of coal resources in Derbyshire has shaped the way the county now looks and operates. Although the mining industry in the Plan Area has declined significantly over the last forty years the area still contains substantial resources of coal. Where those resources could be worked and how they would be extracted will be issues for the new Minerals Local Plan (MLP). Whilst the MLP covers the City of Derby and the rest of the County of Derbyshire (excluding the Peak District National Park area) there are no coal resources within Derby City. All references in this paper to Derbyshire are therefore to the Plan Area outside Derby.

1.3 Coal is a combustible sedimentary rock made of lithified plant remains. It consists of ‘macerals’ (organic equivalent of minerals), minerals and water. A coal seam (layer) is formed by the alteration of dead plant material. Initially, this material accumulates as a deposit of peat at the surface, which is then buried beneath layers of younger sediment. As the temperature rises due to increasing depth of burial, the peat is sequentially altered by the process of ‘coalification’ through ‘brown coals’, which include lignite and sub-bituminous coal, to ‘black coals’ or ‘hard coals’ that comprise bituminous coal, semi-anthracite and anthracite. All the coals produced in, and imported to Britain, are bituminous

[i] Annex 2: Glossary, page 69, Revised National Planning Policy Framework, (July 2021)

coal and anthracite. As a result of subsequent faulting and folding of coal-bearing strata, coal seams occur at varying depths from the surface. In Britain coal seams vary in thickness from a few centimetres up to 3.5 metres, although exceptionally thicker (5 metres) seams may occur.

1.4 The coalification process involves the loss of water and volatile components in the form of carbon dioxide and methane. This results in an increase in carbon content, from about 60% in peat to more than 90% in anthracite, which is often described as ‘low-volatile coal’.

1.5 The physical and chemical qualities of coal, often referred to as coal quality, determine whether a coal can be used commercially, either on its own or after processing or blending with other coals to improve coal quality. Calorific value (CV) is one of the main quality criteria used by coal consumers. It is the heat energy given off by the combustion of a unit quantity of fuel. It increases from peat, through to brown coal and then to more in bituminous coal and anthracite.

1.6 The fundamental division of bituminous coal by end-use, and thus also by trade category, is into thermal or steam coal, used for burning in power stations and in other industrial and domestic uses, and coking or metallurgical coal, used in the steel industry to de-oxidise iron ore in the blast furnace. Coal quality is important as it affects the operation of the plant in which it is used, and thus the costs of generating power, through increased costs of both maintenance and conformity with environmental legislation. For example, the presence of chlorine is detrimental in coal as it causes corrosion in boilers as well as causing pollution. Sulphur is another serious impurity in coal, causing both corrosion and atmospheric pollution. When released as sulphur dioxide it causes acid rain. The sulphur content of English coals is relatively high compared to other world-traded coals and coal from Wales and Scotland.

1.7 There are two principal methods of extracting coal. Where coal seams are at shallow depths below the surface, i.e. within the ‘exposed coalfield’ area, the coal can be extracted by surface mining methods. Where the seams are deeper, underground methods are employed. The Coal Authority defines

shallow mining as extraction at depths of less than 30 metres[ii] but surface mining can take place at much greater depths.

1.8 Small scale mining of surface deposits dates back thousands of years. It is known that the Romans were exploiting all major coalfields (except for north and south Staffordshire) by the late 2nd century. Much of its use remained local, but a lively trade developed along the North Sea coast supplying coal to Yorkshire and London. Deep mining developed alongside the Industrial Revolution, where the coal was often used to power steam engines. The oldest coalfields are those in Newcastle and Durham, South Wales, the central belt of Scotland and the Midlands. Prior to the 1880s coal was mined from underground using pick and shovel. Coal-cutting machines invented at the time increased the rate at which coal could be extracted.

2 Geology

2.1 The coal measures in Britain comprise a series of sedimentary rocks which were deposited around 300 - 330 million years ago during the Upper Carboniferous period (see Figure 1 below). Carboniferous Britain and northern Europe formed a low-lying plain backed by newly formed mountains to the south and a shallow sea to the north, beyond present day Scandinavia. Tropical waterlogged mires developed across Britain and Ireland, and whilst coal formed across the whole area, uplift due to tectonic activity and erosion has removed much of the coal bearing sequence.

2.2 In England and Wales coal-bearing rocks are almost entirely confined to the Pennine and South Wales coal measures groups of the Upper Carboniferous (Westphalian) age. Coal seams occur at fairly regular intervals, interbedded mainly with claystones, siltstones and sandstones. In parts of northern England, and notably in the Midland Valley of Scotland, older coals also occur in strata beneath Westphalian aged successions. In Scotland these occur principally in

[ii] Coal Authority *'Past shallow mine workings metadata'* version 4

Limestone Coal and Upper Limestone formations, with locally thick coals present in the Passage Formation.

2.3 Coal-bearing strata occur at the surface in a number of discrete 'exposed coalfields' but also dip beneath younger rocks to form 'concealed coalfields'. Despite a long history of coal mining in Great Britain, considerable resources remain at depths readily accessible by underground mining methods and closer to the surface where they can be obtained by surface mining (see Figure 2 below).

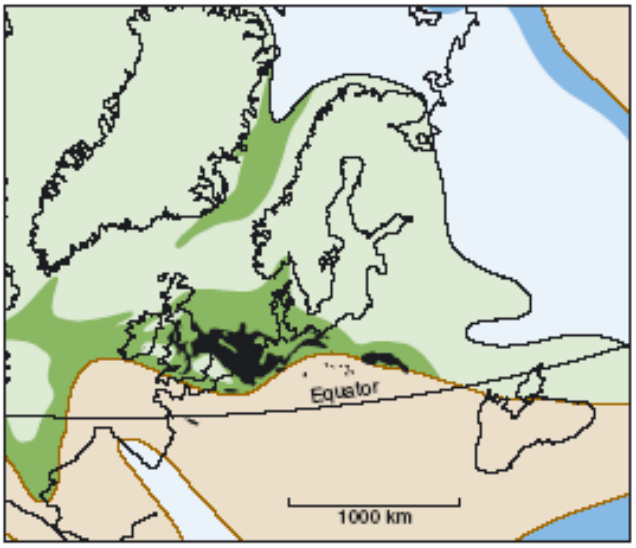

Figure 2.32 A map of the present-day North Atlantic region showing the palaeogeographical distribution of mires in Late Carboniferous times. Most of central Europe was mountainous, bounded to the north by low-lying plains and coal-forming mires. Areas where the major Carboniferous coal-bearing rocks are preserved (both at the surface and at depth) are superimposed in black.

Figure 1; Source: Open University 2008

2.4 There are two coalfield areas within Derbyshire (see Figure 2 below). The North Derbyshire Coalfield is the southern part of the much wider Yorkshire/ Nottinghamshire/Derbyshire Coalfield stretching from southern Leeds in the north to the Nottingham area in the south. The South Derbyshire Coalfield is part of the Midlands Coalfield, which extends from Staffordshire in the west through southern Derbyshire into Leicestershire. The coal seams vary in thickness up to several metres and, in Derbyshire, around 30 seams in all are substantial enough to be worked commercially.

2.5 The South Derbyshire Coalfield is a north-west to south-east trending coalfield located to the south-east of Burton-on-Trent. It covers an area of 36km², and is contiguous to the west, beyond the Netherseal fault, with the East Staffordshire area of concealed coal measures. It is connected to the adjacent Leicestershire Coalfield to the east by the north-west trending Ashby anticline. Coals are known from the Lower, Middle and Upper Coal Measures. The main seams are the Upper Kilburn, Block, Little, Little Kilburn, (Over & Nether) Main, Little Woodfield, Lower Main, Woodfield, Stockings, Eureka, Stanhope, Kilburn, Fireclay and Yard. The seams in the South Derbyshire Coalfield are mainly high volatile and non-caking. There is very little variation in rank across the coalfield. Seams in the South Derbyshire Coalfield are fairly shallow, typically less than 450m in the deepest parts of the coalfield.

2.6 Within Derbyshire, the shallow coal measures occur in a substantial tract of the County in the area around Chesterfield, between Bolsover in the east and the Peak District National Park in the west, extending southwards, east of a line from Holymoorside to Belper, as far west as Ilkeston. Around Swadlincote, shallow coal deposits occur in the area from Burton-on-Trent and Repton Common in the north to Measham, in Leicestershire, in the south. Shallow coal deposits also occur in the north-west of the County, mainly outside the National Park boundaries between Charlesworth and Whaley Bridge, but these are not, generally, of commercial quality.

2.7 There is also the underground coal resource; located to the east of the main Derbyshire shallow coal measures, below an area of Permian Limestone. Whilst there is no potential for surface extraction in this area (the thickness of the limestone beds would make this uneconomic), there may be some potential for either underground mining or alternative extraction methods such as coal gasification or coal bed methane extraction. For more information about the sourcing of gas from coal measures please see the *Derbyshire and Derby Joint Minerals Local Plan – Towards a Minerals Local Plan Winter 2021/2022 Consultation – Draft Plan Gas from Coal background paper*.

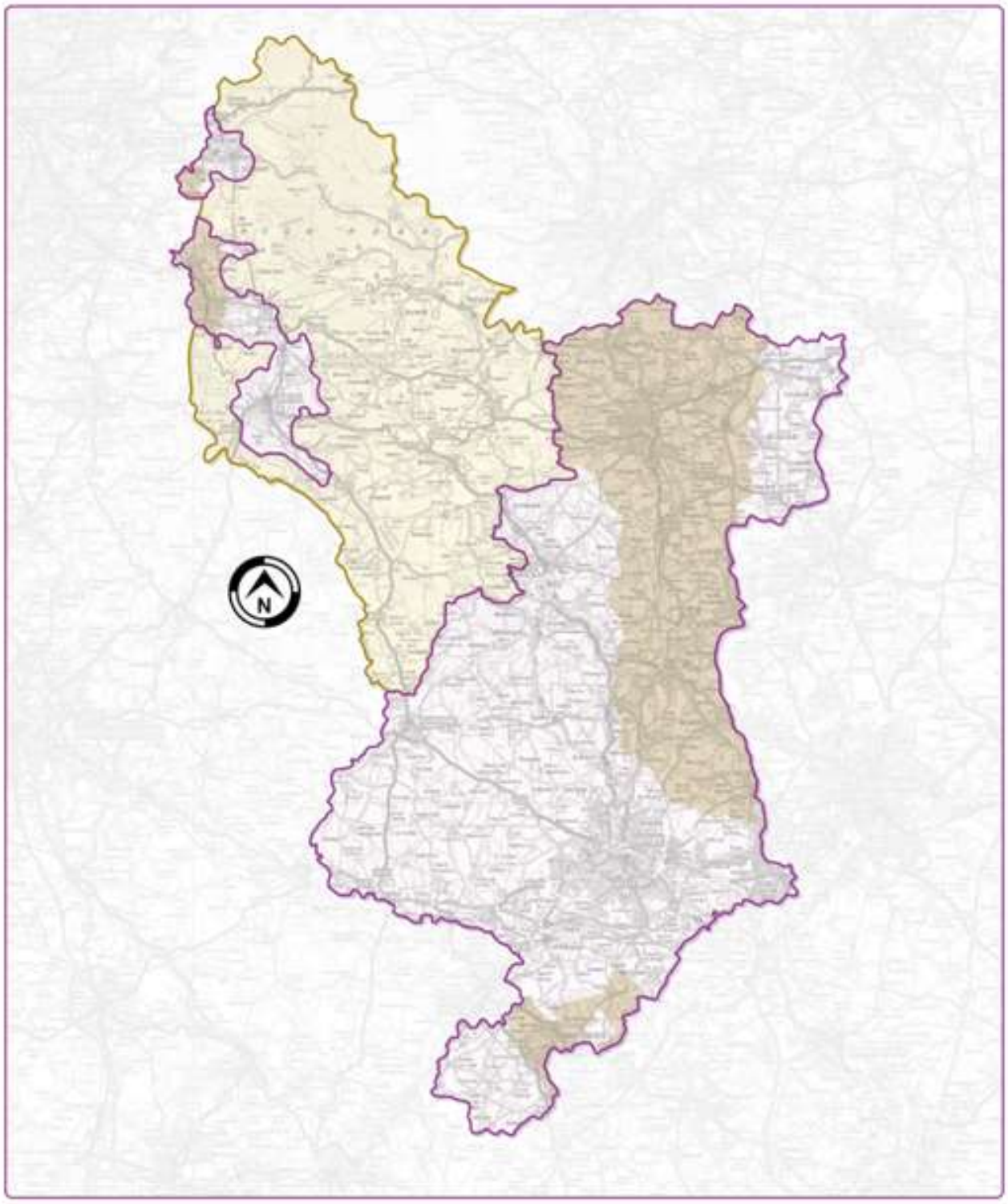

Figure 2: Derbyshire Surface and Underground Coal Resource

3 Exploration, Working and Reclamation

3.1 Information about the geological formation of the UK has been researched and mapped by the British Geological Survey[iii]. This information identifies the extent of different minerals, including that of coalfields. The extent of coal resources and how much of that resource is potentially available for working in a commercially viable manner is determined through further exploration activities. The process usually involves carrying out geochemical and geophysical surveys, followed by explorative drilling. This allows an accurate picture of the area to be built up. The prospective developer will only seek to progress their plans if the results indicate that the resource is large enough and of sufficient quality such that the coal can be economically recovered. Would-be developers then need to obtain a further planning permission from the mineral planning authority and a licence from the Coal Authority before mining operations begin.

3.2 The choice of mining method is largely determined by the geology of the coal deposit.

3.3 Surface Mining

After carrying out preparatory works (for example fencing and vegetation clearance), the operator begins excavation with the stripping and stocking of top soil and sub-soil. These have to be kept separate and in good condition for use in the restoration of the site. The storage mounds are often used to form embankments on the edge of the extraction site to screen it and to provide noise attenuation baffles. Although referred to as surface mining, the coal reserve is usually several metres below the surface and it is therefore necessary to remove the materials lying between the soils and the coal. This is referred to as overburden and the depth of overburden is a factor in the overall cost and viability of a surface mine development. The overburden is also stored for use in restoration.

[iii] British Geological Survey https://www.bgs.ac.uk/mineralsuk/

3.4 Where possible, extraction is then normally phased so that only part of the whole site is disturbed at any one time, which in turn enables phased restoration to be undertaken. This reduces the need for the long-term storage of the soil resource as this can be detrimental to its quality. As part of the phased approach, coal is extracted in a series of ‘benches’. Where seams of coal are contained within a host rock, blasting is sometimes required to loosen it. The coal is normally loaded onto lorries (sometimes via rail where available) and taken either to the nearest coal disposal point for grading or direct to the customer. There are no operational disposal points in the county at the present time.

3.5 The economics of a surface coal mine are largely determined by the market for coal and geological conditions within the site. Economic sites are typically worked at a maximum overburden-to-coal ratio of between 10 to 1 and 15 to 1. Consequently, the surface mining of coal involves using large engineering plant and machinery in order to remove relatively small quantities of coal, and the impact of a surface coal operation on the environment can therefore be significant. Although surface mining is essentially a temporary use of land, lasting anything from 18 months to 10 years, some of its effects can remain for a period after working has ceased. For example, it can take several years for a restored site, including the landscaping, to fully mature to a point where the site has been fully assimilated into the surrounding landscape and the footprint is no longer discernible.

3.6 These effects can be ameliorated to some extent by careful pre-development planning and the effective monitoring of operations. The large amounts of overburden that have to be removed mean that, through sympathetic and well-managed restoration, original landforms can be recreated or more attractive ones produced over time. Furthermore, as the volume of coal extracted is relatively small in comparison to the surface area, sites can be restored to original levels. Some restoration schemes can provide important local environmental benefits, including the creation of additional ecological features and wildlife habitats. Other surface mining developments have, in the past, enabled areas of despoiled and derelict land to be reclaimed or have involved

the removal of problems arising from underground workings such as subsidence and dangerous emissions of methane gas.

3.7 Underground Mining

There are two main methods of underground mining: pillar-and-stall and longwall mining. In pillar-and-stall mining, coal deposits are mined leaving behind ‘pillars’ of coal to support the roof of the mine. Longwall mining involves the full extraction of coal and the mined-out areas are allowed to undergo controlled collapse as mining proceeds. All large, deep mines in Great Britain used the longwall method where a ‘panel’ of coal (a defined area of the seam) is accessed by driving parallel tunnels (called gates) within the seam along two sides of the panel, about 250 to 350 metres apart. These are joined by a further cut at right angles that becomes the working face. A coal cutting machine called a shearer then cuts coal by repeated passes along the face, which either advances into areas of virgin coal (‘longwall advance’) or retreats towards the main roadways within the mine (‘longwall retreat’). Coal is removed by conveyor belt along the gates. The roof strata along the coal face are supported by hydraulic roof supports that are moved sequentially, allowing the roof strata to collapse behind. It is this action that may result in subsidence being evident at the surface.

3.8 Depending on seam thickness, practically all the coal in a panel may be removed by this method, but for technical reasons, typically only 50% of the available coal in an underground mine is recovered.

3.9 The underground working of coal at major collieries creates large volumes of waste or ‘spoil’, the disposal of which is one of the main potential causes of environmental impacts. Greater mechanisation has resulted in large increases in the production of spoil, and despite the cessation of large-scale deep mine production in Derbyshire, the remaining spoil tips are part of the legacy of the mining industry. Some of the tips have been completely removed as part of redevelopment schemes whilst many others have been restored and landscaped. These restoration schemes often involve re-profiling of the tips

rather than complete removal but this, in combination with the landscape planting, reduces the appearance of the tips and helps them be assimilated into the surrounding area. Some of the materials which were previously placed in the tips as unwanted and unusable waste materials now have a commercial use and several tips have been reworked to extract this previously discarded resource. This includes red shale but can also include quantities of coal which are now recoverable due to the availability of improved processing equipment. The most widespread impact of underground working, however, is caused by subsidence at the surface. A 1989 survey commissioned by ten Local Authorities in Derbyshire and Nottinghamshire (undertaken by Trent Polytechnic) revealed that 33,000 houses in the two counties had been affected by mining subsidence. The main factors affecting the extent of subsidence are seam thickness and depth beneath the surface.

3.10 The environmental impact of smaller drift mines can be much less significant. In particular the problems of waste disposal and subsidence can virtually be avoided where the extraction of coal is not highly mechanised but is selective and limited through the use of a pillar and stall system. The waste that is produced can sometimes be deposited in the remaining void following extraction of the coal. This usually offers a satisfactory solution provided its impact on water resources is acceptable.

3.11 Ancillary Minerals

The geological conditions which gave rise to the creation of coal also support the presence of clay and there is a strong correlation between the respective industries. In Derbyshire, clay has been extracted almost exclusively from the coal measures of the exposed coalfield covering the area of northern, eastern, and southern Derbyshire. A wider range of clay types and qualities has been exploited supporting a variety of industries, including brick, pipes, refractories, sanitary ware, art and tableware. Brick clay occurs widely in Derbyshire and was supplied to a small number of brick manufacturers, all of which have now closed. The southern part of Derbyshire is an important source of fireclays (used to make buff and pale facing bricks for example). Fireclays are

sedimentary mudstones which underlie almost all seams and the close association with coal means that the supply is highly dependent on surface coal mining operations, although only a small proportion of sites produce fireclay, either because they do not contain fireclay of suitable quality or because of planning restrictions. Further, more detailed information regarding Fireclay and Brick Clay is available in the *Towards a Minerals Local Plan: Winter 2021/2022 Consultation – Proposed Draft Plan Brick and Fireclay Background Paper*, December 2021.

3.12 Hybrid Method

Augering is a mechanical form of underground mining and its usage is relatively new in the UK. It can be carried out within the excavation of a surface mine or, where the coal seams are close to the surface, by 'trenching'. It involves boring along the coal seams adjacent to the excavation or trench by an Auger, which is a large drill bit with a threaded, corkscrew shank which pushes the coal out behind the advancing drill. This method leaves supporting pillars of coal within the seam to minimise the risk of subsidence. Augering can enable additional coal to be removed, which may not otherwise be extracted due to economic or environmental constraints.

3.13 Coal Preparation

Coal straight from the ground, known as run-of-mine (ROM) coal, often contains unwanted impurities such as rock and shale and comes in a mixture of different-sized fragments. However, coal users need coal of a consistent quality and sometimes a consistent size. Coal preparation – also known as coal beneficiation or coal washing – refers to the treatment of ROM coal to ensure a consistent quality and to enhance its suitability for particular end-uses. Screening equipment separates the coal into similar size pieces. Many of the collieries and some of the surface mining sites in Derbyshire incorporated coal preparation facilities within the development.

3.14 Coal Transportation

The movement or transport of coal involves two separate stages; the first is within the excavation or mining site and the second is onwards from the extraction site to its ultimate destination. Within an underground mine coal is mostly transported to the mine shaft by conveyors from where it is brought to the surface. For short distances within surface mining sites excavated coal will be moved by dump truck or conveyor. These methods will also be employed at large user sites such as power stations where large quantities are kept available for use.

3.15 The method of transport of coal off-site depends on the distance to be covered and the facilities available at or near to the mine. The main method is usually by heavy goods lorries. Most former deep-mine collieries in Derbyshire were long-term sites and had dedicated rail connections enabling the movement of coal by train, often directly to the receiving power station. Some of the more recent surface mine operations (for example Renishaw and Forge and Monument) have also used rail as the main method of transport, taking advantage of the proximity to main railway lines. The high cost of connecting to the rail network however, has meant that most other surface mine sites have relied on road transport, particularly so for those smaller sites of limited duration. In the early part of the last century some mines were able to utilise canal systems to transport coal but the closure of the canals means that this is no longer an alternative for sites in Derbyshire. In some circumstances coal can be mixed with water to form coal slurry and transported through a pipeline. Coal transportation can be very expensive – in some instances it accounts for up to 70% of the delivered cost of coal.

3.16 **By-products**

Methane gas is frequently released by coal mining operations and in some cases it can be recovered and used as a process fuel on site. Methane also collects in abandoned coal mines, sometimes in sufficient volumes for it to be extracted and used to generate electricity.

3.17 Colliery spoil is produced at all deep-mine operations and consists mainly of mudstone and siltstone. These materials may be used as a low-grade aggregate, for example, as bulk engineering fill. In 2001, 783,000 tonnes was used for fill in England and Wales out of total arisings of 8 million tonnes. Old colliery spoil is also used on a small scale in brick making, and at one site in North Wales it is used as the clay feedstock for cement manufacture. The tips at old collieries often contain a proportion of coal due to the inefficiencies of the screening equipment used at the time. Some of the former colliery tips have been reworked to recover this remaining coal.

4 Coal Authority

4.1 Following the privatisation of the coal industry in 1994, the Coal Authority owns, on behalf of the country, the vast majority of the coal resource in Great Britain. It is a non-departmental public body sponsored by the Department for Business, Energy & Industrial Strategy (BEIS) (formerly the Department for Energy and Climate Change (DECC)), and was established by Parliament in 1994. It undertakes specific statutory responsibilities associated with:

- licensing coal mining operations
- administering coal mining subsidence claims
- dealing with property and historic liability issues
- providing access to information on coal mining.

4.2 The main function of the Coal Authority is to manage the coal resources of the country. It seeks to encourage economically viable operations to work these resources whilst working to protect the public and the environment in coal mining areas.

5 Production, Consumption and Reserves of Coal

5.1 Global

In 2019, global coal production was 7953 million tonnes, a 1.5% increase compared to the previous year. China continued to supply the largest amount

of coal with production at 3658 million tonnes in 2019 (46% of the total). In general, the increase in coal production was driven by countries in the Asia-Pacific region (China, India and Australia) with production in the United States and Europe seeing a general decline[iv].

5.2 Total proved global reserves are estimated to be (at end of 2020) 10,741,08 million tonnes. This is split into 7,536,39 million tonnes of anthracite and bituminous coal and 3,204,69 million tonnes of sub-bituminous and lignite coal[v].

5.3 Worldwide, the demand for coal dropped 3.3% in 2019, reflecting weak electricity growth demand, stronger contributions from renewables and lower gas prices. The sharpest declines were seen in the European Union (approximately -19% compared to 2019 figures) and the United States (approximately -14% compared to 2019 figures). By contrast, coal consumption in the Asia Pacific region increased 1.2% over the same period. In general, these trends reflect the commitment of a number of countries in Western Europe to phase out coal-fired power generation. However, coal remains the major fuel used for generating electricity and demand for it is likely to remain stable, with China, India and some countries in South and Southeast Asia either maintaining the existing demand or increasing demand for coal-fired power generation. In 2017, according to the International Energy Agency, coal was used to generate 38% of the world's electricity and 27% of all energy used worldwide[vi]. Coal also plays a crucial role in industries such as iron and steel.

5.4 The quantity of coal that is traded is a significant proportion of the amount consumed, but many of the largest producers use the majority of the coal they produce. Around 17% of global coal consumption was traded in 2014[vii].

[iv] International Energy Agency (IEA) Coal 2020: Analysis and forecast to 2025 (2020)

[v] BP Statistical Review of World Energy 2021, 70th Edition

[vi] International Energy Agency 'Coal 2018: Analysis and Forecasts to 2023: Executive Summary' (2018)

[vii] https://www.carbonbrief.org/mapped-the-global-coal-trade (2016) based on information published in the UN Comtrade database and BP Statistical review of World Energy 2015

Transportation costs account for a large share of the total delivered price of coal, therefore international trade in steam coal is effectively divided into two regional markets (the Atlantic market and the Pacific market).

5.5 National

Production of coal in the UK peaked in 1913 at 292 million tonnes[viii]. Thereafter, output declined, due in part to the loss of export markets during and subsequent to the First World War and also in part to competition from oil and other fuels. However, the UK remained a net exporter of coal until the early 1980s.

5.6 Following the oil crisis in the early 1970s it was perceived that the world could no longer count on the long-term supply of cheap oil. The *Plan For Coal*[ix]*,* published in 1974, envisaged that UK coal output would increase to about 150 million tonnes by 1990, based on the concept of '300 years of reserves'. UK coal production reached only 93 million tonnes in 1990[x] and was thereafter on a downward decline which accelerated due to the increasing use of natural gas in electricity generation (the 'dash for gas'). This followed increasing concerns about carbon emissions and climate change, the exhaustion of reserves in many older pits and the lack of the considerable investment required to develop new ones. Following the miners' strike in 1984, the UK became a net importer of coal, a trend that has continued, and imports of coal at 36 million tonnes exceeded that of 32 million tonnes for the UK for the first time in 2001[xi].

[viii] BEIS 'Historical coal data: coal production, availability and consumption 1853 to 2018' https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption

[ix] National Coal Board (1974) The Plan for Coal

[x] BEIS Historical coal data: coal production, availability and consumption 1853 to 2018' https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption

[xi] BEIS Historical coal data: coal production, availability and consumption 1853 to 2018' https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption

5.7 Since it was privatised in 1994, the British coal industry continued to face difficult market and technical conditions. From a position in 1995 where 32 operational mines produced 53 million tonnes of underground sourced coal, production fell to only 17 million tonnes from 13 operational mines in 2007. By the end of 2015 the UK deep mine coal industry had effectively ceased (total UK underground coal production in 2018 was 21,206 (approximately 0.02 million) tonnes[xii]).

5.8 Surface mined coal, which began as a wartime emergency in 1942, has proved to be a more cost-effective source of coal. Production increased to a peak of 21 million tonnes in 1991[xiii], and although it has since declined, surface mined coal has contributed an increasing proportion to the UK coal output, particularly in Scotland, overtaking deep mined coal for the first time in 2007. In 2012 surface mined coal production was 11 million tonnes compared to 6.2 million tonnes from deep-mined coal. The latest figures continue to show a decline in production, with surface mined coal production falling to 2.6 million tonnes in 2018, and deep mined coal just 0.02 million tonnes[xiv]. This decline in coal production appears to be a continuing trend, with recently published figures from DBEIS indicating that total (surface and deep mined) coal production fell to 0.5 million tonnes during the second quarter of 2019, down 25 per cent compared with the same quarter in 2018[xv].

5.9 In 2012, Coal Authority estimates of the remaining level of coal reserves and resources in the country were 3,685 million tonnes of underground coal, of which 1,675 million tonnes were covered by current licences (including closed mines still in licence). For surface mining resources the comparable figures were 890 million tonnes, of which 115 million tonnes were covered by current

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[xii] BEIS 'Digest of United Kingdom Energy Statistics 2019'

[xiii] BEIS Historical coal data: coal production, availability and consumption 1853 to 2018' https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption

[xiv] BEIS 'Digest of United Kingdom Energy Statistics 2019'.

[xv] BEIS 'Energy Trends September 2019'

licences. To set this in context, the total quantity of coal production from surface mined sites between 1942 and 2011 was 830 million tonnes.

5.10 Coal consumption has mirrored UK coal production. Consumption has fallen gradually from a level of 157 million tonnes in 1970 to 48 million tonnes in 2014 and a sharp fall to 12 million tonnes in 2018. In 2012, for example, consumption was 64 million tonnes, with net imports contributing 45 million tonnes[xvi]. The main sources of imports are (approximate figures over several years) Russia (40%), South Africa (30%), Australia (10%) and Columbia (7.5%). The recent development of the shale gas industry in the USA means that increasing quantities of coal from there are now being traded on the world market. During 2018, for example, imports from the USA totalled 3.6 million tonnes.

5.11 The largest use of coal within the UK has traditionally been for electricity generation, for example consuming approximately 80 to 90 million tonnes per year in the period 1980 to 1991. Other notable uses include coke manufacture (9.4%) and blast furnaces in the steel industry (2.0%). Domestic heating uses approximately 1.1%. In 2018, about 3.9% of the UK's electricity was generated from coal, a significant decrease from 2011 when coal produced about 30%, and down from 4.8% during 2017[xvii]. The planned closure of many coal-fired power stations (or conversion to other fuels) will inevitably result in a further decline.

5.12 **Derbyshire**

As can be seen from Figure 4, production of coal in Derbyshire has fallen from over 2.6 million tonnes per annum in 1996 to about 15,000 tonnes in 2016, a decline of over 99%. Figures for 2018 show that there was a further decline to 13,540 tonnes by the end of 2018[xviii].

[xvi] BEIS Historical coal data: coal production, availability and consumption 1853 to 2018' https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption

[xvii] BEIS 'Energy Trends September 2019'

[xviii] BEIS 'Digest of United Kingdom Energy Statistics 2019'.

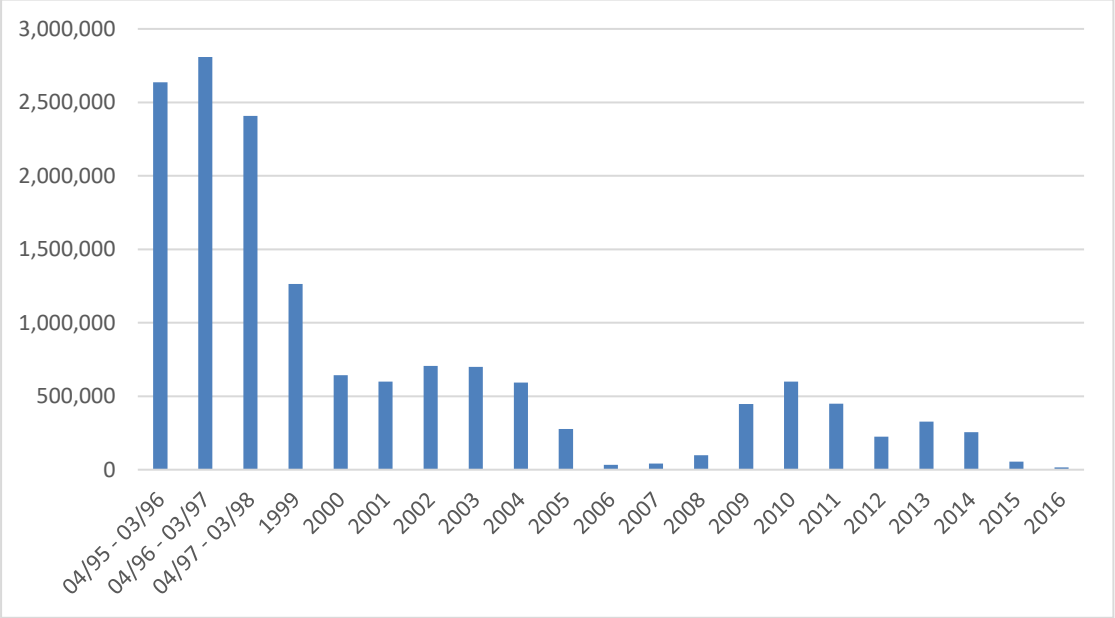

Figure 4: Derbyshire Coal Production (tpa)

5.13 Surface Coal Mining

The working of coal near to the surface, by modern methods, began in Derbyshire in the 1940s, as in other coalfields, as an emergency measure to help supply the country's war time energy needs. Since that time a large proportion of the area of the shallow coalfield has been exploited. Annual output reached a peak of 2.7 million tonnes in 1956. Thereafter output has varied between 1 and 2 million tonnes per year, and in recent years, following the completion of working at several sites, output has declined significantly. At present there is only one operation where coal is being extracted as part of a wider mineral development at Hartington Tip, Staveley operated by Fitzwise Ltd, which is anticipated to finish by the end of 2021.

5.14 There are areas within the Derbyshire coalfields where coal seams close to the surface have not yet been exploited and which could potentially be subject to future working. In the absence of detailed investigation it is not possible to estimate accurately the extent of these resources. It is considered likely however, that proposals for further surface workings will be developed and put forward during the Minerals Local Plan period to 2036. Each case will be considered on its merits against national policy and the framework that will be

established in the new minerals plan, so it is not possible to predict the level of future output.

5.15 Underground Coal Mining

Underground coal mining activity in Derbyshire declined in line with the national picture. Fifty years ago around 60,000 people were employed in over fifty Derbyshire collieries, but this figure declined as the older mines working the shallower seams closed and working became concentrated on the newer mines to the east, working the deeper, more profitable seams. The decline of the Derbyshire mining industry continued throughout the 1970s and 80s and the last operational colliery in the South Derbyshire Coalfield area at Cadley Hill (near Swadlincote) closed in 1988. The last three remaining British Coal collieries in the northern area at Bolsover, Markham and Shirebrook closed in 1993. The last underground coal mine in Derbyshire, Eckington Drift Mine, closed in January 2019.

5.16 Whilst deep lying coal resources still remain, the high cost of the investment set against the fluctuating price of coal and the availability of supplies from other sources means that it is unlikely there will be proposals for major new colliery developments in Derbyshire in the foreseeable future, although there is some potential, so it remains an issue for the Minerals Local Plan.

6 Economics

6.1 The trading price of coal is a very important issue for the coal extraction industry and relatively small fluctuations can determine whether or not operations are economically viable. Fluctuations in prices affect the ability of the industry to make long term plans. The following review indicates how the price of coal has varied in recent years.

6.2 International Trade

In 2016, the NW Europe price for coal averaged $59.87 per tonne of coal which represented a 50% drop in price since the high of 2011. By December 2019 the

NW Europe price had increased again to an average of $91.83 per tonne of coal, up 8.66% on the price in 2018 of $84.51 per tonne.[xix]

6.3 Most coal from both surface and deep mines in the UK is produced and delivered to the rail networks at costs that are competitive with imports. The Government expects that if UK producers can obtain world market equivalent prices, profits can be generated for investment in existing deep mines and in new surface mines. Prices would have to rise considerably, however, for the development of new deep mines to be economic in the UK, given the current investment climate in the industry.

6.4 Coal Quality Issues

Most UK produced coal falls in the high sulphur band between 1.4-2.2%, with the average around 1.7-1.8%. There is little prospect of this being significantly lowered given the lack of accessible low sulphur reserves in the UK and the high costs of washing fines to remove sulphur.

6.5 In the current international market most coal that is traded has sulphur levels in the range 0.6% to 0.85% on a weight basis. A small proportion of coal is traded with sulphur levels close to UK norms (1.7%), and these coals tend to be traded at a discount to standard grades. There are larger tonnages of very low sulphur coals, primarily from Indonesia, which attract a premium.

6.6 The implication for UK mined coals is that sulphur levels are going to impact negatively on the price that they can achieve in the market place. The extent to which this happens will depend on the value of low sulphur coal in the UK and international markets and the supply of low sulphur coals, and the extent to which the retro-fitting of flue gas desulphurisation equipment onto more power stations expands the number of sites able to burn coal mined in the UK.

6.7 The Potential for Coal Exports

[xix] https://ycharts.com/indicators/northwest_europe_coal_marker_price (as at 3 December 2019)

DBEIS suggests that there is little prospect of the UK being able to export coal, due to the lack of purpose-built coal export capacity, the high sulphur and ash content, low calorific value and the expectation that UK coal prices will be too high.

7 Coal-Related Policy

National Planning Policy Framework (NPPF) (July 2021)

7.1 National policy for the extraction of coal and the disposal of colliery waste is set out in the NPPF which was revised in July 2021, which replaced most previous policy guidance and statements, specifically that in Mineral Planning Guidance Note 3: Coal Mining and Colliery Spoil Disposal, 1999.

7.2 In general terms, the NPPF recognises the important contribution of minerals to our way of life. It states at paragraph 209 that *"It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation."*

7.3 The NPPF includes advice on the need to balance the need for minerals with appropriate environmental considerations and sets out the broad approach to mineral plan making and procedures. The general advice on mineral development (paragraph 210) is that mineral planning authorities should have planning policies that *"f) set out criteria or requirements to ensure permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality*". As part of the wider advice on oil, gas and coal exploration and extraction, paragraph 215 states that *"Mineral planning authorities should:*

d) indicate any areas where coal extraction and the disposal of colliery spoil may be acceptable;

e) encourage the capture and use of methane from coal mines in active and abandoned coalfield areas; and

f) provide for coal producers to extract separately, and if necessary stockpile fireclay so that it remains available for use."

7.4 Specifically in regard to coal developments paragraph 217 states that, *"Planning permission should not be given for the extraction of coal unless:*

a) the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or
b) if it is not environmentally acceptable, then it provides national, local or community benefits which clearly outweigh its likely impacts (taking all relevant matters into account, including any residual environmental impacts)."

7.5 The NPPF does not contain any Government target for coal production, either from underground sources or by surface mining. Government energy policy states that decisions on the supply of energy derived from different fuels are matters for the markets, reinforced by long-term policy measures.

Planning Practice Guidance

7.6 Planning Practice Guidance (PPG) states that *"The environmental impacts of coal extraction should be considered in the same way as for other minerals. However, both coal operators and mineral planning authorities must have regard to the environmental duty placed on them under section 53 of the Coal Industry Act 1994 when preparing and determining planning applications."*

7.7 In addition it states that underground mining can raise additional issues to surface coal mining which mineral planning authorities may wish to take into consideration. These are identified as; the potential effects of subsidence, including potential hazards of old mine workings; the treatment and pumping of

underground water; monitoring and preventative measures for potential gas emissions; and the method of disposal of colliery spoil.

National Energy and Climate Change Policy

7.8 With its abundant reserves, indigenous coal was previously a very important element of the energy infrastructure of the United Kingdom. Whilst coal still plays a major role, it is now one of many options for energy production, and of the coal that we do use the proportion obtained from outside the UK has risen significantly in the years since the large-scale colliery closures of the 1980s. There has also been a significant decline in the number of operational coal-fired power stations in recent years. Issues about how we will ensure secure, clean and affordable energy in the future and how reliant on external sources of fuel we will be to produce that energy are matters of increasing importance.

7.9 There have been several important stages in the evolution of current national energy policy which, increasingly, have recognised the need to adapt to climate change whilst maintaining secure energy supplies. The Department of Trade and Industry paper, *Meeting the Energy Challenge*, 2007[xx] stated that England, Wales and Scotland's substantial remaining coal reserves have the potential not only to help meet our national demand for coal and to reduce our dependence on imported primary fuels, but also to contribute to the economic vitality and skills base of the regions where they are found. However, the position of coal is also influenced by other external forces, including climate change, which are set out below. For more general information about Climate Change, a separate paper *'Towards a Minerals Local Plan: Proposed Draft Plan Consultation 2021 – Background Paper: Climate Change'* has also been prepared in support of the new Minerals Local Plan.

7.10 Energy policy since 2008 has been influenced by The Climate Change Act 2008 which set in legislation the UK's approach to tackling and responding to climate

[xx] Department for Trade and Industry 'Meeting the Energy Challenge, A White Paper on Energy' May 2007

change. It introduced the UK's long-term legally binding 2050 target to reduce greenhouse gas emissions by at least 80% relative to 1990 levels and introduced 'carbon budgets' which cap emissions over successive 5-year periods which must be set 12 years in advance. This is already having an effect, and will continue to have an effect in the long-term.

7.11 **Large Combustion Plant Directive (2001/80/EC) and Industrial Emissions (Integrated pollution prevention and control) Directive (2010/75/EU)**

The Large Combustion Plant Directive (2001/80/EC) [xxi], which came into effect in 2001, aimed to reduce harmful industrial emissions. It required European member states to legislatively limit sulphur dioxide, nitrogen oxides and particulate matter emissions on pre-1987 large combustion plants including fossil-fuel power stations by January 2008. The Directive was subsequently replaced by the Industrial Emissions Directive (IED)[xxii] in January 2016. The IED, which incorporates the requirements of the LCP, aims to reduce harmful industrial emissions particularly through the use of Best Available Techniques (BAT). It sets out a number of options for plant operators to control emissions including (i) fitting emissions control equipment to comply with the directive; (ii) not fit emissions control equipment but only run for a total of 17,500 hours between January 2016 and December 2022, after which the plant must close; and (iii) enter into the Transitional National Plan, which gives an additional four years to reduce emissions down to IED levels or, if they fail to comply by 2020, be limited to running for 1,500 hours per year (equivalent to 4.1 hours per day).

7.12 Industry response to both Directives has seen a significant decline in the number of operational coal-fired power stations since 2001. From the position of 11 plants operating in the UK at the start of 2016, and following the recent decision by the Secretary of State for Business, Energy and Industrial Strategy (DBEIS), permission for the construction of two Closed Cycle Gas Turbines

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[xxi] Large Combustion Plants Directive (2001/80/EC)
https://ec.europa.eu/environment/archives/industry/stationary/lcp/legislation.htm

[xxii] Industrial Emissions (integrated pollution prevention and control) Directive (2010/75/EU)
https://ec.europa.eu/environment/industry/stationary/ied/implementation.htm

(CCGT) at Drax power station, the last two remaining coal units at the site will be replaced by 2023, with other plant closures planned by the end of 2023 (West Burton A) and 2024 (Kilroot). Only one coal fired power station, Ratcliffe, is expected to operate up to or beyond 2025.

7.13 The draft National Policy Statement for Energy, published in 2009, built on the 2007 Energy White Paper. Together they formed an evolving international and domestic energy strategy in response to the changing circumstances in global energy markets. They set out to address the long-term energy challenges of security of supply, whilst acknowledging the implications of climate change. Whilst recent emphasis has been on the development of renewable energy supplies the Government recognised the important and continuing role that indigenous sources of coal would play in meeting national energy requirements. It was seen as a flexible source of energy generation, an alternative to an over dependence on gas and as a back-up to intermittent renewable energy supplies. This approach was subsequently reaffirmed in the Overarching National Policy Statement for Energy[xxiii] published in July 2011, which provided further clarification of the Government's plans for a transition to a low carbon economy.

7.14 This policy is set against the background of changes in the sources of supply of the raw materials used to meet our energy requirements and as an aid to the understanding of this situation this paper includes a summary of these changes. By 2004 the United Kingdom became a net importer of natural gas and a net importer of oil in 2010. Increased output of indigenous oil and gas and renewables in recent years has seen the level of imports drop off slightly with around 36% of energy used in the UK during 2018 being from imported sources[xxiv]. The level of coal production in the UK has also fallen sharply, mirroring the continued decline in coal-fired electricity generation. As a result,

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[xxiii] Department for Energy and Climate Change 'Overarching National Policy Statement for Energy (EN-1)', July 2011.

[xxiv] DBEIS 'UK Energy in Brief 2019' www.gov.uk/government/statistics/uk-energy-in-brief-2019

the UK now imports nearly all of the coal it consumes. During 2018, coal imports stood at 10 million tonnes which, whilst representing a 19% increase compared to 2017, is significantly less than the 50.3 million tonnes imported during 2013[xxv]. Despite this, whilst many of the collieries were considered to be uneconomic in the 1980s, the UK still has substantial reserves of coal available in the ground. At the end of 2010, it was estimated to have reserves of approximately 290 million tonnes of anthracite and bituminous coal.

Energy Act 2013

7.15 The Energy Act received Royal Assent on 18 December 2013. The Act has several objectives and in relation to hydrocarbons it seeks to make provision for the setting of a decarbonisation target range and duties in relation to it; or in connection with reforms to the electricity market for the purposes of encouraging low carbon electricity generation, or ensuring security of supply. It is also about the designation of a strategy and policy statement concerning domestic supplies of gas and electricity. Whilst the Act does not actually proscribe new strategy or policy, it sets the procedural requirements for doing so. It is likely however that future policy and strategy will reflect the overall objective of the Act to reduce our carbon footprint and in turn this will affect the future demand for fossil fuels, including coal.

7.16 **Carbon Price Floor, 2013**

One Government measure intended to help deliver the targeted reduction in carbon emissions required by the Climate Change Act 2008 is the Carbon Price Floor (CPF), which is a tax on carbon dioxide emissions. The CPF, which was introduced in 2013, consists of two elements, the EU Emissions Trading Scheme (EU-ETS) carbon price and a UK-only element, the carbon price support (CPS), which 'tops-up' the carbon price set by the EU- ETS. In the presentation 'Budget 2014 Representation from the Association of UK Coal Producers 'CoalPro'', February 2014, the group contend that there should be a freeze on and a review of the Carbon Price Floor at 2014 levels (£9.55t/CO_2)

[xxv] DBEIS 'UK Energy in Brief 2019' www.gov.uk/government/statistics/uk-energy-in-brief-2019

on the basis that it was already at the absolute maximum that could be absorbed without significant detrimental impacts to the country's electricity supply industry and markets. The group acknowledged the original purpose of CPF was to stimulate investment in low carbon technologies, but later expressed the view that, set on an upward price trajectory, and diverging from EU carbon prices, it will result in the early closure of UK coal plant, risk UK energy security, cause carbon leakage and drive up energy prices (increasing fuel poverty) without delivering the new low carbon technology.

7.17 **The Capacity Market, 2013**

In 2013, as part of its Electricity Market Reform package, the Government introduced the Capacity Market (CM) in order to ensure security of electricity supply. The CM ensures sufficient reliable capacity to meet peak demand by giving all capacity providers a steady payment to ensure enough capacity is in place to meet demand. It is intended to encourage investment in new generation capacity or for existing generation capacity to remain open, providing backup for more intermittent and inflexible low carbon generation sources. The CM is primarily run through a series of annual auctions held four years in advance, the first of which took place in 2014, theoretically allowing time for the construction of new generating plant. A smaller auction is also held one year ahead. As originally envisaged, the CM has accepted bids from any form of generation capacity, including coal, except low-carbon capacity where it receives other support/incentives. Coal/biomass energy generation was awarded capacity agreements for 9,232.183 MW (18.74% of total capacity)[xxvi] 4,684.196 MW (10.11% of total capacity)[xxvii] of energy respectively during the 2014 and 2015 auctions.

7.18 A five-year review of the CM[xxviii] undertaken in 2019 indicates that whilst it is not intended to drive decarbonisation, it has been designed to be compatible

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[xxvi] National Grid, Final Auction Results: T-4 Capacity Market Auction 2014

[xxvii] National Grid, Final Auction Results: T-4 Capacity Market Auction for 2019-2020

[xxviii] DBEIS, Capacity Market: Five Year Review 2014 – 2019
https://www.gov.uk/government/publications/capacity-market-5-year-review-2014-to-2019

and consistent with wider decarbonisation policies. For example, capacity providers are expected to comply with emissions limits set out in other legislation such as the IED (see paragraph 7.11 above).

Written Ministerial Statement November 2015, 'Priorities for UK Energy and Climate Change Policy'

7.19 In November 2015, the Secretary of State for Energy and Climate Change presented a Written Ministerial Statement (WMS) entitled '*Priorities for UK Energy and Climate Change Policy'* to Parliament. Whilst the WMS did not change national planning policy or guidance in respect of coal it set out the Government's thinking on the approach to energy supply. The Secretary of State stated that "*Affordable, reliable clean energy is critical to our economy, our national security, and to family budgets. We need secure energy so people can get on with their lives and businesses can plan for the future. Affordable energy so the people that foot the bill get a good deal, and clean energy to safeguard our future economic security and ensure we can meet our climate change commitments*." She added "*New nuclear and gas will be central to our energy secure future and we are encouraging investment in our shale gas exploration so we can add new sources of home-grown supply to our real diversity of imports*." The WMS goes on "*one of the greatest and most effective contributions we can make to emissions from electricity generation is by replacing coal fired power stations with gas*." The programme was to be subject to consultation but indicated a restriction on the use of coal by 2023 and the possible closure of all coal-fired power stations by 2025. This was subject to the development of the infrastructure to enable the shift to take place.

7.20 **Paris Agreement, December 2015**

In December 2015 the UK, as part of UN negotiations and along with other 190 other countries, drafted the Paris Agreement to tackle climate change. The Agreement, which came into force at the end of 2016, aims to limit global warming to well below 2°C and pursue efforts to limit it to 1.5°C. It also requires all parties to put forward their best efforts through the production of nationally determined contributions and to strengthen these efforts in the years ahead. There are requirements for Parties to report regularly on their emissions and on

their implementation efforts, with a global ‘stocktake’ every five years to assess collective progress.

7.21 **Coal Generation in Great Britain: The Pathway to a low-carbon future: Consultation document, December 2016**

Following on from the November 2015 WMS, in December 2016, DBEIS published a consultation on proposals to end unabated coal generation by 2025. The purpose of the consultation was to seek views on four issues: the possible approaches for placing obligations on unabated coal plant from 2025; whether and how constraints on coal generation could be placed on coal generation before 2025; and whether, in the context of the reformed Capacity Market and concerns over security of supply, it was necessary to put in place powers to suspend the proposed obligations on coal. The consultation also sought opinion on the wider impacts of the above proposals.

7.22 **Implementing the end of unabated coal by 2025: Government response to unabated coal closure consultation, January 2018**

In January 2018, DBEIS published the Government response to its December 2016 consultation. In it, the Government proposed to set a new unit-by-unit emissions intensity limit of 450g CO_2 per kWh to generating units which would apply from 1 October 2025.This was considered to provide coal generators with more flexible options to reduce emissions to a level that would align with the Government’s ‘decarbonisation pathway’. The October 2025 start date would also effectively prevent unabated coal units from bidding into the four-year Capacity Market auctions from 2021/2022 (see paragraph 7.16). Due to the requirements of the IED; carbon pricing; the relatively poor economics of coal generation and the increasing flexibility of the electricity system (to which coal is not well-placed to respond), it was considered that the majority of the UK’s remaining coal-fired power stations would either close or invest to abate emissions during the early 2020s, with only approximately 1.5GW of unabated coal capacity remaining until 2025.

7.22 The Government considered that the Capacity Market (paragraph 7.17 above) would ensure sufficient generation capacity was in place to replace unabated

coal units after closure, although this would be subject to review. The Government also considered it prudent to retain emergency powers preventing the closure of any remaining unabated coal units in October 2025, in case of significant and imminent concerns about security of supply where there might be a shortfall in electricity generation (or the risk of one) where the suspension would wholly or partially mitigate that risk. It was proposed that such arrangements could not be invoked any earlier than six months before 1 October 2025. The consultation response also acknowledged that the continued transition away from coal generation would have an impact on jobs and communities, such jobs being associated with the power stations and their supply chains, including the coal mining industry.

7.24 **HM Government, Clean Growth Strategy: Leading the way to a low carbon future, October 2017**

The Strategy sets out the Government's policies and proposals to reduce emissions across the economy and promote clean growth in the period up to 2032 and beyond. The strategy reiterates the Government's ambition for a diverse electricity system with secure, affordable and clean power supplies and, whilst not making any definite statements regarding coal, sets out one possible 'pathway' which could result in emissions falling by 80 per cent as a result of phasing out unabated coal and growing renewables and nuclear to 80% of energy generation.

7.25 **DBEIS, UK Draft Integrated National Energy and Climate Plan (NECP), January 2019**

In the context of planning ahead for withdrawal from the EU the draft stated that, *"On energy, the UK is seeking co-operation with the EU to support the delivery of cost efficient, clean and secure supplies of electricity and gas, based on competitive markets and non-discriminatory access to markets."* On climate change it stated *"that the UK recognises the shared interest in global action on climate change and the mutual benefits of a broad agreement on climate change co-operation."*

The paper provides a review of important statements on energy and climate change (for example the Clean Growth Strategy October 2017) which set the framework, objectives and targets. It reaffirms the need to ensure energy security and energy efficiency, the approach to decarbonisation and the policies and measures relating to these and other issues. Whilst it addresses a wide range of energy and climate change issues, no explicit reference is made to coal.

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

On 26 June 2019, the Climate Change Act 2008 (2050 Target Amendment) Order 2019 came into effect. The order has the effect that the minimum percentage by which the net UK carbon account for the year 2050 must be lower than the 1990 baseline is increased from 80% to 100%.

7.27 In terms of meeting the carbon budgets, the first (2008-2012) was outperformed by 1% and the second (2013-20170 by 14%. The Government's energy and emissions projections 2018 (published April 2019)[xxix] predicted that the third (2018-2022) would be outperformed by around 3% but predicted a projected shortfall of around 6% and 10% against the fourth (2023-2027) and fifth (2028-2032) budgets respectively. These predictions were before the more stringent target amendments.

7.28 **Electricity Regulation (recast) (EU) 2019/943 and HM Government, Proposals for Capacity Market Emissions Limits: Consultation, July 2019**

In July 2019, the EU introduced a revised Electricity Regulation which sets an upper limit on carbon emissions for all plant included in Member State capacity Auctions. Article 22, which relates to Design principles for capacity mechanisms, requires all member state capacity mechanisms to incorporate certain requirements regarding CO2 emission limits so that a) from 4 July 2019 any new generation capacity that emits more than 550g of CO2 of fossil fuel origin per kWh of electricity; and b) from 1 July 2025 any generation capacity

[xxix] DBEIS, Updated energy and emissions projections 2018, April 2019

that started commercial production prior to 4 July 2019 that emits 550g of CO2 of fossil fuel origin per kWh of electricity and more than 350kg of CO2 on average per year shall not be able to receive payments under a capacity mechanism. At the same time, the UK Government sought views on whether the 1 July 2025 date set out in the Regulation should be brought forward to 2024 to coincide with GB capacity market delivery year for 2024/2025.

7.29 **HM Government, Industrial Decarbonisation Strategy, CP399, March 2021**
The strategy sets out the Government's policies and proposals for the decarbonisation of the industrial sector to enable the UK to meet its net-zero targets by 2050. Specifically with regard to coal, the strategy focuses on the use of coking coal in steel manufacturing processes stating *'Coking coal is currently essential for primary steel manufacturing using the basic oxygen furnace route, which produces the highest quality steel and is the dominant technology in Europe. This strategy takes a technology-neutral approach and so does not rule out the use of coking coal in an integrated steel making process together with CCUS as a net zero compliant option going forward. Any mining of the coal itself needs to be net zero compliant in the future. The mining sector needs to plan for this in partnership with government, in line with the principles set out in this strategy.*[xxx]*'*. The strategy also explores options for the decarbonisation of the cement sector in dispersed locations, including a number of cement plants/kilns located within the Plan Area, through the use of a 'zero-carbon' fuel mix.

Local Planning Policy

Derby and Derbyshire Minerals Local Plan

7.30 The current Minerals Local Plan, adopted 2002, contains three policies relating to coal covering coal extraction and colliery spoil disposal; opencast constraint areas and coal stocking. Of these Policy MP27: Coal Extraction and Colliery Spoil Disposal and MP29: Coal Stocking are considered to largely accord with the requirements of the NPPF, although the former does not make provision for

[xxx] HM Government, Industrial Decarbonisation Strategy, **CP399,** March 2021, Page 53

‘national benefits’ as set out in the NPPF. Policy MP28: Opencast Constraint Areas does not accord with current national planning policy. For completeness, the wording of all three policies is set out in the paragraphs below:

7.31 **Policy MP27: Coal Extraction and Colliery Spoil Disposal**

‘A. Proposals for coal extraction, and for the disposal of colliery waste, including extensions to existing sites either in area or depth, will not be permitted unless the impact on the environment:-

1) is acceptable, or capable of being made acceptable by planning conditions or obligations, or
2) if not, the impact is clearly outweighed by local or community benefits that the development would provide.

B. When considering whether a proposal is environmentally acceptable or capable of being made so, the following will be taken into account, where relevant:-

1) the need to ensure that, where the proposal lies within the Green Belt, it can be developed, operated and restored to the highest standards
2) the extent to which the proposal would adversely affect efforts to attract or retain investment in an area
3) the need to ensure that where the proposal involves the disposal of colliery spoil:-
(i) an evaluation of all feasible alternative sites and methods of disposal has been carried out; and
(ii) the proposal represents the most acceptable solution having regard to environmental, economic and technical considerations
4) the extent and degree of potential subsidence or land instability.

C. When considering whether the unacceptable adverse environmental impact of a proposal is outweighed by the benefits that the development would provide, importance will be given to those benefits that would be unlikely to be

achieved by any other means. In particular, the following will be taken into account, where relevant, either separately or cumulatively:

1) the extent to which the environment or communities of the area will benefit from the proposed working and subsequent reclamation, for example; by the restoration of previously despoiled areas; by the stabilisation of unstable ground; by enhancing the landscape, or by contributing to biodiversity. Particular importance will be given to proposals involving the reclamation of despoiled land, especially those that would enable former colliery sites to be released quickly for beneficial new uses

2) whether the proposed extraction is necessary in advance of other approved permanent development in order to avoid the sterilisation of reserves of minerals,
or to provide sites for development which would provide local or community benefits, provided that:

(i) any additional adverse effects caused by the mineral working will be kept to an acceptable level; and
(ii) the extraction will be completed and the land reclaimed in time, and to a standard, to allow the subsequent development to take place as planned without unreasonable delay

3) whether it is necessary to remove the coal to facilitate the efficient and economic working of other minerals in an environmentally acceptable way
4) The extent to which the proposal would provide employment opportunities or other economic benefits.

7.32 **Policy MP28 - Opencast Constraint Areas**

Within areas defined as "opencast constraint areas" on the proposals map, proposals for opencast coal extraction will not be permitted, unless the proposal would not cause any material damage to the area's conservation interests.

7.33 **Policy MP29: Coal Stocking**

Proposals for the use of land for the stocking of coal will not be permitted unless:

1) the location of the site is well-related to the supplying operations and where feasible, and environmentally preferable, alternative means of transporting the coal other than the use of public roads are maximised, and

2) the operations can be accommodated in an environmentally acceptable way.

Where permission is granted, conditions will be imposed to limit the extent and duration of the development'.

8 Coal Mining Issues

8.1 Coal mining developments, either underground or surface mining, are major operations which can have significant economic, social and environmental impacts. The section below addresses some of the main issues which have been raised in responses by the public to publicity concerning coal mining proposals determined by Derbyshire County Council. It is not intended to be an exhaustive list as each case is individual and any proposal may involve some issues which are not pertinent to other proposals.

Environmental Impact of Coal Mining

8.2 The review of remaining resources and reserves in Derbyshire indicates that the majority of future coal mining proposals are likely to be based on surface mining operations. The main potential environmental impacts of this form of coal extraction are as follows:

Visual Intrusion

8.3 Surface mining involves the use of extensive site areas and results in significant changes to the land, albeit for temporary periods. The removal of soils and overburden to access the coal measures below involves the removal of all or many of the surface features in the area, such as trees and hedgerows, and this can have a significant impact on the landscape and the appearance of the area. The soils and overburden have to be stored for use in the restoration of the site and the storage mounds can be substantial in extent and height. The degree of visual intrusion will be affected by the topography of the surrounding land, and this can help reduce or increase the impact on an area depending on the orientation of the site. Most surface mining sites are restored to the same or similar contours and uses as they were prior to extraction, and most restoration schemes include the planting of new trees and hedgerows which help assimilate the sites into the surrounding landscape, although it takes several years for landscape planting to mature. The retention of trees on site boundaries can help reduce the visual impact of a site and this can be enhanced where additional tree planting is undertaken well in advance of a development. Surface mining can have beneficial landscape impacts where it involves the clearance, removal and remediation of derelict buildings and land or the removal of contamination. In these cases it enables the land to be put back to a more beneficial after-use which may not have been possible without the mining operation.

8.4 There are a number of established techniques which are available to guide the assessment of landscape and visual impacts and these assessments are taken into account in the determination of proposals at the planning application stage.

Noise

8.5 Modern surface mining involves the use of large scale plant and machinery to undertake the necessary engineering works and to extract and process the coal. Similar plant and machinery is also required to restore the land after extraction works are completed. Lorries or other means of transport are required to move the coal and other materials within the site and off-site to the eventual user. All these operations generate noise and have the potential to

generate noise at unacceptable levels, depending upon the proximity of receptors and the mitigating effects of any noise attenuation measures. Methods for assessing the likely level of noise to be generated by coal extraction and other mineral developments have been detailed in Government publications and the latest guidance is now available in the PPG (Paragraphs 019 – 022, March 2014). This is a live publication and will be updated when any new guidance on noise or any other technical issue is available.

Dust

8.6 The operations which could give rise to noise emissions also have the potential to generate dust which could affect those near to an operational site. The amount and type of dust that could be generated would depend on the scale of engineering works involved, the ground conditions (soil/rock type, water table and moisture content), the presence or absence of on-site coal processing activities and the use of dust suppression measures. The extent of the area that could be affected by such emissions would depend on topography and the prevailing wind direction and strength. The significance of the impacts of dust emissions would depend on the effectiveness of the mitigation measures (such as the use of water bowsers and hard surfaces for haul roads) and the distance between the extraction area and other dust generating works and sensitive receptors. The methods of assessment have also been the subject of specific Mineral Planning Guidance and the latest guidance on this issue is now available in the PPG (Paragraphs 023 – 032, March 2014).

Transport

8.7 Coal is a bulky material and is transported in large quantities. Surface mining developments can generate significant levels of vehicle movements which require an appropriate form of access on to the highway and an appropriate link to the wider highway network. The movement of these vehicles generates diesel emissions and can have an adverse impact on the area in terms of highway safety and air quality, especially when they pass through built-up areas. Lorry movements can also cause damage to the environment and

amenity from noise, dust and vibration. These effects can be avoided or minimised by the use of alternative forms of transport such as rail, but this is not always possible. The impacts of transport are normally addressed via a formal Transport Statement or Transport Assessment. The latest guidance on this issue is now available in the PPG (Paragraphs 001 – 015, March 2014).

Water Environment

8.8 The disturbance to the ground arising from surface mining can affect the water environment of an area. The creation of a void significantly alters the natural drainage system over the site surface and downwards through the soils and other materials. The disposal of surplus water within the void space is an integral part of mining operations and the way in which sites are dewatered can also affect the drainage system of the area and potentially result in the pollution of water courses and underground water features. Drainage from spoil tips and processing operations are other aspects which could impact on the water environment. Knowledge and understanding of the hydrology of an area prior to the commencement of development can help the formulation of measures to be incorporated into the design of the development to minimise and mitigate these impacts.

Ecology

8.9 The removal of trees, hedgerows and other vegetation could impact on the ecology of an area, both directly on the features within a site and indirectly on areas around and connected to a surface mining site. The direct impacts would be those on the species and habitats on the site, whilst indirect impacts could include the loss of foraging areas within the mining site for birds and animals living nearby. The use of an appropriate phasing scheme may help reduce such impacts and the restoration of a site can provide the opportunity to increase the ecological value of an area in the longer term but this balance is an important factor in the assessment of the acceptability of development proposals.

Agricultural Land

8.10 Coal can only be worked where it exists and in Derbyshire much of remaining coal resource lies underneath agricultural land. The geological conditions which give rise to the presence of coal are ones which are often associated with the presence of clay and other ground conditions which are not conducive to creating high quality agricultural land (as defined in the Ministry of Agriculture, Fisheries and Food Agricultural Land Classification System). Nevertheless the impact on agricultural holdings is an important factor in the assessment of development proposals and a significant consideration in the design of restoration schemes.

Ground Stability and Subsidence

8.11 Whilst surface mining operations work the coal resource closest to the surface the excavations involved can be very deep and involve the movement of considerable volumes of materials. All the excavated materials have to be placed back into the void to recreate an acceptable landform. This has to be done in a suitable manner to create appropriate compaction rates and avoid any long term stability problems. Subsidence is only an issue for underground mine working. The factors to be taken into account in the assessment of quarry-slope stability are identified in the PPG (Paragraph 033, March 2014).

Heritage and Archaeology Features

8.12 The removal of most, if not all ground level features, could impact upon the heritage assets and archaeological remains of an area. The careful design of a development could help to avoid the most important of these features, allowing them to be preserved for the benefit of future generations. In some cases the excavation of the soils could expose and allow examination of archaeological features which would not otherwise be possible. The latest advice on conserving and enhancing the historic environment is available in the PPG (Paragraphs 001 - 010, July 2019)

Rights of Way and Recreation Facilities

8.13 Surface mining developments could impact on existing rights of way and other recreational facilities in an area. Footpaths can be temporarily diverted and returned to their rightful course when the site has been restored but consideration also needs to be given to the impact of a development on the users of rights of way which abut or are close to an extraction area whilst the operations are taking place.

Environmental Impacts of Deep Coal Mining

8.14 The environmental impacts referred to above are also potential impacts of deep coal mining. In addition the working of coal from deep underground could give rise to other environmental impacts including:

- Impacts from the use of a large area of land for a long period (visual impacts, disruption to existing uses and potential contamination of the land)
- The need to dispose of other materials extracted along with coal resulting in the need for substantial colliery disposal tips
- Treatment and pumping of underground water
- Monitoring and prevention of gas emissions from current and former deep mines
- Hazards of old deep coal mine workings
- Subsidence and damage to land and buildings over a wide area

Social Impact of Coal Mining

8.15 The potential impacts of mining developments are not restricted to environmental issues. Social impacts can also be experienced by the community or communities who live and work close to a mining development. Impacts can be direct and physical, such as the loss of local facilities, including footpaths and recreational areas or the loss of the ability to visit and enjoy an area of countryside. Other impacts can be ones perceived by the community at large which affect the quality of life and their living experience. The perception of these impacts will be greater where the community has experienced other

similar effects in the past. This relates to the issue of cumulative impacts which is addressed below.

8.16 In contrast, where mining activity has formed the main focus of an area, the sudden loss of a mine, the jobs it provided and the income it generated can have adverse social implications. Where the mine was the main reason for the existence of a settlement the impact of the loss could be profound leading to the decline of the area and deprivation.

Economic Impact of Coal Mining

8.17 There are a number of direct economic benefits which are derived from coal mining. The coal produced has a value which contributes to the national gross domestic product. Coal produced in this country contributes to our energy requirements and also reduces the amount we need to import, which helps to reduce our international trade deficit. The income derived also contributes to the profitability and viability of the operating company. Coal mining developments create a number of jobs, although for surface mining the jobs are limited in duration. Surface mining companies normally maintain a group of key staff with particular skills and knowledge who travel from site to site and not all of the employment opportunities may be available to local residents. Nevertheless the presence of the additional income will result in an increase in spending in the area.

8.18 Mining developments can also give rise to negative economic impacts. The main issue is the potential discouraging effect on the economy of an area by the presence of mining activity. The decline of the Derbyshire coal industry left many areas suffering long-term adverse social, environmental and economic effects. Many initiatives have been brought forward during the last 40 years to help regenerate these areas. The focus has been on measures to improve the image of the area, to encourage economic regeneration and assist in alleviating economic and social deprivation. Some former colliery sites have been redeveloped as new industrial estates providing alternative employment opportunities. Observations received by the County Council in response to coal

mining development proposals indicate that some people consider the introduction of further mining activities in areas where regeneration activities are in train would deter developers from moving to the area, stifling the success of such initiatives. The potential effect of further mining developments on regeneration initiatives is therefore an important element in the consideration of individual proposals.

Cumulative Impact of Coal Mining

8.19 This is a particularly important issue for the former coalfield areas of the County where the long-term cumulative effects of previous and ongoing mining and other traditional industries has reduced the capacity of the area to absorb further, similar developments. These areas have suffered from the presence of the underground and surface mines. They have suffered the visual effects of the mines and associated tips and other ancillary facilities, from the adverse impacts on the landscape, on the quality of the environment and the overall image of the area. These impacts have often been exacerbated by the simultaneous presence of other heavy industries which utilised the coal obtained from the mines. The loss of the mining industry and associated businesses has also left a legacy of environmental pollution and degradation, of social deprivation and inequalities and profound impacts on the economies of the respective towns and villages.

8.20 The sensitivity of these areas to further adverse impacts will be an important element in the determination of future mining proposals. The ways in which the sensitivity of an area will be assessed and how cumulative impacts could be evaluated have been addressed in a separate paper, *Towards a Minerals Local Plan: Summer 2020 Consultation Background Paper Cumulative Impacts (March 2019).*

Assessment of Benefits

8.21 The NPPF recognises that coal mining can have adverse environmental impacts which may warrant applications for proposed developments to be refused. It also states that such adverse impacts may, in some cases, be outweighed by the national, local and community benefits of such developments. It does not prescribe how those benefits will be assessed or the weight to be given to them but in the local context these benefits could include:

- The provision of coal required for the production of domestic energy
- The provision of indigenous coal in preference to imported sources
- The provision of jobs
- The provision of economic benefits to an area from the jobs and the increase in spending
- The potential removal of derelict land and buildings
- The potential removal of contamination
- The potential improvement of ground conditions
- The potential improvement to the drainage of the site
- The potential improvement to the agricultural performance of the land
- The restoration of land to other beneficial uses
- The potential improvement to rights of way
- The potential improvement to recreational facilities
- The potential improvements to the landscape and visual appearance of the land
- The potential improvement and enhancement of the ecological value of the land
- The potential benefits of any off-site improvements (such as highway improvements) which are required to enable the development to commence

8.22 The range and scope of these benefits and how they will be used in the assessment of future coal mining development proposals is an important issue for the new Minerals Local Plan to determine.