

TOWN AND COUNTRY PLANNING ACT 1990

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT
PROCEDURE) (ENGLAND) ORDER 2015/595

TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND)
RULES 2000/1624

PLANNING INQUIRY UNDER SECTION 77 OF THE TOWN AND COUNTRY
PLANNING ACT 1990 IN RELATION TO THE PLANNING APPLICATION
REFERENCE 4/17/9007 FOR APPLICATION FOR DEVELOPMENT OF A NEW
UNDERGROUND METALLURGICAL COAL MINE AND ASSOCIATED
DEVELOPMENT TO BE LOCATED AT
FORMER MARCHON SITE, POW BECK VALLEY AND AREA FROM MARCHON
SITE TO ST BEES COAST, WHITEHAVEN, CUMBRIA

PINS REFERENCE: APP/H0900/V/21/3271069

WCM/MAK/3

REBUTTAL PROOF OF

Mark Kirkbride, CEng, MPhil, BEng (Hons), FIMMM
On behalf of West Cumbria Mining Ltd

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1. Introduction

- 1.1. I have read the Proof of Evidence of the following authors, submitted by Rule 6 parties:
 - i. Ms Rebekah Diski [SLACC/RD/1]
 - ii. Professor Paul Ekins OBE [SLACC/PE/1]
 - iii. Professor Stuart Haszeldine OBE [SLACC/SH1]
- 1.2. There are a number of matters I take issue with in each of these.
- 1.3. This rebuttal seeks to deal with some key matters in order to illustrate where my concerns lie with regard to them. I do not intend to offer a response to all issues raised and where I have not dealt with an issue this does not imply that I agree with it.

2. Ms Diski

- 2.1. Ms Diski, in her Proof of Evidence at Section 1 (Introduction) sets out her role, background and experience. I cannot see or find any experience or knowledge of mining, tunnelling, construction or related activities that would provide the necessary knowledge and insight to be able to provide valid evidence in relation to the 'employment benefits' as referenced in para. 1.5, which would need to include the operation of an underground mine and the roles, skills and jobs therein involved.
- 2.2. In section 2.1, Ms Diski states that no methodology has been provided for the projected employment numbers. At no stage were any requests for methodology made by other parties during the lengthy application process. I would refer to extensive documentation, available within the public domain and as published by West Cumbria Mining via their website, that sets out very clearly a series of explicit aspects in relation to employment and overall numbers of jobs. This includes:
 - Woodhouse Colliery: Update Brochure, January 2020
 - WCM Factsheets - Apprenticeships
 - WCM Factsheets - Education
 - WCM Factsheets - Employment
 - WCM Factsheets – Underground Jobs

- WCM Factsheets – Work Underground
 - Project Facts – Part 1 to Part 3 (Employment, Economics, Local)
- 2.3. Further information in relation to the number of jobs has also now been provided within the appendices to my proof of evidence. Enclosed within that proof is a detailed organogram, which is an example of the extent and detail of the work completed by the WCM team in relation to roles, training, competence, and recruitment.
- 2.4. As well as WCM providing an organogram showing the full production direct employee breakdown, the external assessment completed by NERA further sets out very clearly the resulting estimates of indirect and induced roles, which fully supports the original figures included within the original planning submissions referenced by Ms Diski.
- 2.5. At para 2.4, Ms Diski states ‘in my view’ in relation to the calculation method to assess how many full-time equivalent (FTE) jobs for each role based on how long an activity takes. Ms Diski goes on to quote an example of a shuttle car journey and how many journeys would be completed in an 8-hour day.
- 2.6. Based upon the above stated view by Ms Diski, it is clear to me that the author does not properly understand the working methods involved in an underground mine. I shall go on to explain this further using the example to which Ms Diski refers.
- 2.7. I would like to draw the Inspector’s attention to a few key differences as I see it between the points raised by Ms Diski, for consideration here, as follows.
- 2.8. At the outset, it is important to set out that an underground mine is not a factory – employees do not move from one task to another, based upon specific activity times. They are deployed for the whole period of their shift to work on a clearly defined and dedicated role. Each employee will need to have specific skills and formalised competencies, achieved through training and approved accreditation systems operated by WCM and audited externally via relevant industry bodies to ensure that they meet the requirements set out by Her Majesty’s Inspectorate of Mines, part of the UK Health and Safety Executive.
- 2.9. WCM will need to demonstrate full compliance with The Mines Regulations 2014. Regulation 11 specifically references “competence” and sets out the core requirements which the mine operator must adhere to. This specifically includes:
- A competency management system;

- National Occupational Standards in mining to be used as the basis for training and competency assessment, and
- It states that the mine operator must ensure that -
 - (a) *no person undertakes any work at the mine unless the person either is competent to do that work or does so under the instruction in, and to supervise, the doing of that work; and*
 - (b) *'no work is undertaken at the mine unless a sufficient number of persons are present who have the requisite competence to perform the tasks assigned to them'*

- 2.10. It is important to correct the erroneous statement by Ms Diski that there would be an 8-hour 'day'. The mine will operate on a 7-day week, with a multi-shift system to achieve optimum performance over a 24-hour day. This will be broken down into a series of shifts, of length from 8 hours up to 11 hours per day, depending upon the system the mine management agree with the employees to be the optimum preference at that time.
- 2.11. The shuttle car example that Ms Diski seeks to quote illustrates to me, as an experienced mining executive, that she has very limited or no understanding of the workplace underground, methods of work or nature of the role. The shuttle car driver is dedicated to that role for the whole of his shift, with the aim of completing the greatest number of journeys within that period, safely and securely. In that case, the driver has no other role.
- 2.12. For the sake of clarity, a shuttle car is an electrically powered, rubber tyred haulage vehicle which has an open, truck style body and a driver's cabin. The shuttle car is loaded by a coal cutting machine at the face of the tunnel and transports the coal a short distance (the maximum cable length for a shuttle car is typically 200m) of up to 180m, where it discharges the loaded coal into a fixed loading point, for onward transfer via conveyor.
- 2.13. A single working panel at Woodhouse Colliery would utilise two shuttle cars, working continuously throughout the period of the shift. In full production there would be five such separate working panels, thus each shift would require 10 (ten) suitably qualified and competent shuttle car operatives.
- 2.14. Any such notion of time and motion studies, or Full Time Equivalent jobs, is a clear misunderstanding by Ms Diski. This demonstrates a basic lack of knowledge or relevant experience of the types of roles and the nature of the employment involved in such operational production orientated roles.
- 2.15. Ms Diski proceeds in the next para. 2.5 to apply her own conjecture when she states: 'I would regard the absence of detail or methods as concerning.' As

set out above, WCM has issued significant detail in the public domain in relation to the nature of the project (deep underground mine) method of mining (mining sheets), equipment to be used and forecast types and quantities of roles.

- 2.16. From this information, it should be clear to anyone experienced in such operations that the number of employees required to operate a mine of this type and size, on an around the clock basis, would be in the many hundreds. Equivalent high production underground mines in Australia and USA employ similar numbers – for example Kestrel underground metallurgical coal mine (Aus) has around 600 direct employees plus significant contractors whilst the Buchanan underground metallurgical coal mine (USA) has around 540 employees.
- 2.17. It appears that Ms Diski’s main criticism in chapter 2 is that there is insufficient evidence to allow an assessment of the expected number of jobs. I disagree with this criticism. It is a core part of any development project to ensure there are accurate estimates of the number of staff positions required. It has not been demonstrated that Ms Diski has any relevant experience or background to be able to provide comment in relation to the FTE requirements exceeding industry norms.
- 2.18. In para. 3.1, Ms Diski refers data from WCM’s survey of local labour. It should be noted that this work was completed as long ago as 2016, given that the application itself was submitted in May 2017. Accordingly, it does not reflect the most up-to-date position. WCM has received significantly more applications which currently includes an overall registration for work database of more than 2,200 people, with 146 experienced UK based miners within that cohort, together with more than 1,065 people who have expressed interest in working in underground related roles.
- 2.19. Ms Diski asserts in this section of her proof (paras. 3.1 to 3.6) that the mine would immediately require all of the underground miners and supervisors. She fails to understand or acknowledge the ramp-up time involved from the commencement of construction, into initial mining, and then the ramp-up in mine output production. Employee numbers increase as production increases, occurring progressively over a period of years.

Year	1	2	3	4	5	6	7	8
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Average Employees	181	268	312	378	412	492	532	532
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- 2.20. The table below provides the proposed build-up over time of total employee numbers.
- 2.21. I refer to the points above regarding the requirements to demonstrate up to date training and competences in regard to the points raised by Ms Diski in her evidence (points 3.5 to 3.7). There is no relevance to the background to the reducing nature of the coal industry in the UK.
- 2.22. There are in any event currently dozens of operating underground mines around the UK, with an extensive existing critical core of skilled and experienced mine workers.
- 2.23. Contrary to the assertions made by Ms Diski, WCM has set out very clear commitments to train UK-based workers. WCM has extensively published in the public domain our agreed working relationship with Lakes College, an award-winning student and adult education centre between Whitehaven and Workington. The College provides over 200 training and development courses, including engineering, mechanical and electrical accredited schemes. WCM have reached agreement with Lakes College to implement bespoke training in key areas to help meet the specific needs of WCM.
- 2.24. As a result, I do not consider the approach or conclusions reached by Ms Diski as being representative of the intentions of WCM or available workforce. WCM has no intention of recruiting workers from countries elsewhere in Europe, as stated by Ms Diski. However, even if this did occur, it is not clear why it should affect the weight to be given to the economic benefits of the scheme.
- 2.25. At the start of section 4, regarding potential employment, Ms Diski is applying great weight to one email from Cumbria County Council, dating back to June 2017, less than a month after the original planning application was submitted. Significant work has been completed by WCM since that time, including extensive further stakeholder engagement events, ongoing registration of interest for employment and dialogue with borough and county council representatives.
- 2.26. As CEO of West Cumbria Mining, I am a core member and regularly attend a high-profile group hosted by the elected mayor of Copeland, Mike Starkie, called the Future Opportunities Group (FOG). This was formed in November

2016 and constituted key business and stakeholder group leaders from across Copeland. Reference can be made to various press articles, including the link below which includes a full list of attendees, including Mark Kirkbride, CEO of WCM <https://cumbriacrack.com/2019/03/21/mayor-hosts-future-opportunities-group/>

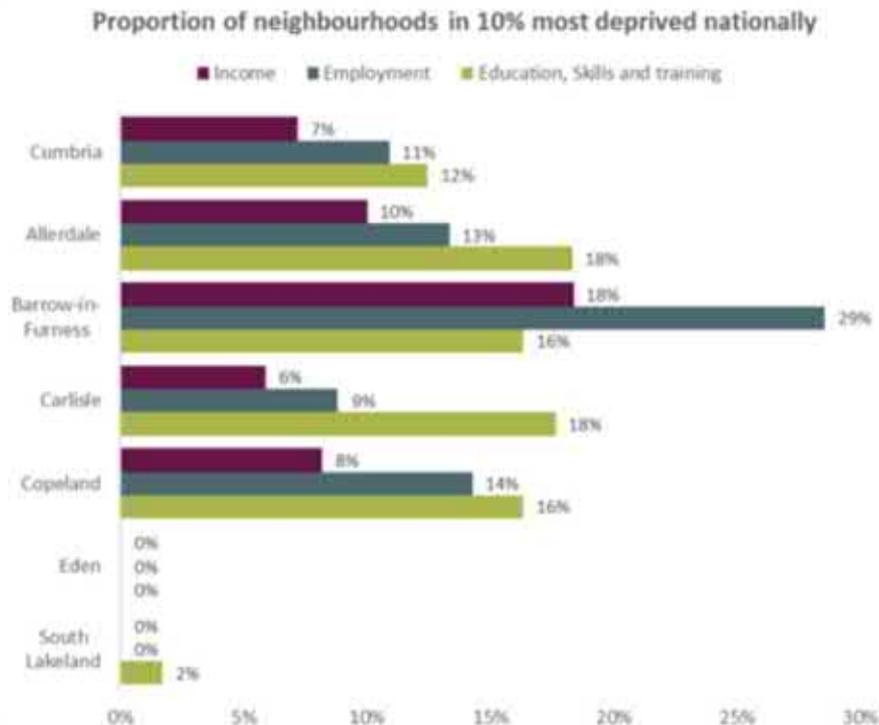
- 2.27. One of the key outcomes from the FOG was the formulation and implementation of a skills and independent Copeland recruitment team, called All Together Cumbria. I was asked to participate at a board level in this initiative. All Together Cumbria has been a significant success in providing a skills and recruitment hub which WCM will support and participate in.
- 2.28. This initiative, which is a social enterprise and recruitment brokerage, includes offering free basic training to local unemployed people, in combination with the local job centre, to further equip those long term unemployed with basic skills so they can re-join the employed cohort. WCM has worked directly with local career development schemes and fully supported the Copeland Council led 'Well Whitehaven' schemes to further support people in the deprived hotspots around Whitehaven and Copeland.
- 2.29. As a direct result of the above, I have a very significant difference of opinion in relation to the claims put forward by Ms Diski, who makes no reference at all to any of these current local initiatives and social impact objectives.
- 2.30. I have also engaged extensively with the Cumbria Local Enterprise Partnership (LEP) with WCM being one of the key sponsors and supporters of the LEP led Cumbria Coast Railway Upgrade scheme. As such, I am familiar with the LEP reporting and assessment of current labour market. Ms Diski wholly fails to refer to the major drive to seek to retain youth populations in areas such as Whitehaven, with Cumbria having one of the highest rates in the country for young adult leavers moving out of the area. The LEP published their latest Local Skills Report in April 2021 (see Appendix 1).
- 2.31. I have previously worked with the chair of the report, Mike Smith OBE, who was another founding member of the Future Opportunities Group. The LEP report includes a series of key findings, including the need for new major large employers to seek to halt and reverse the decline in working age population and the need to improve base level skills through training and qualifications. The LEP also clearly identify that there are significant 'cold spots of weaknesses and deprivation' within Cumbria.
- 2.32. WCM requires very few of the skilled roles which Ms Diski sets out in section 4.2, including advanced manufacturing, construction and professional

services, health and safety and facilities management. In total, of these categories, WCM would require less than a dozen employees. That is around 2% of the WCM workforce. Many of those skills would be sourced from existing supply chain specialist providers, with whom WCM has extensively engaged via a series of supply chain events held at our Haig offices.

- 2.33. Sellafield Ltd is projected to shed between 2,000 to 3,000 roles over the next decade. WCM has already held extensive engagement with the senior HR team at Sellafield in terms of future collaboration in relation to available resources and employer opportunities.
- 2.34. Ms Diski summarises this section by claiming *'it is likely that the Applicant will....find it difficult to recruit people.....locally'*. WCM has clear evidence from extensive engagement with local employment providers, stakeholders and local/regional people that demonstrates it will be able to recruit people who are not currently employed, including school-leavers, young adults, NEETS and unemployed adults. By combining core skilled employees with new recruits who will be fully trained by WCM, there will be no requirement for overseas workers or those who do not wish to permanently reside in the local area of West Cumbria.
- 2.35. The very large proportion of jobs at WCM are not 'skilled' but are 'semi-skilled' and do not require the areas identified in the LEP report – incorrect assumption by Author in terms of skill levels required and training framework from WCM.
- 2.36. Cumbria County Council has limited scope over local Copeland issues. WCM would be offering competitive salaries for key roles – this is not poaching – it is part of a free labour market consistent with government policy. The offer of good salaries can only be seen as a positive benefit. The NERA report confirms the significant positive impacts which will result from the significantly above average salaries at WCM, especially in comparison to the low level of salaries typically associated with tourism related employment.
- 2.37. In section 5, Ms Diski seeks to suggest that the creation of a new major employer in West Cumbria (West Cumbria Mining) will directly impact the ability to resource future 'planned' projects aligned to the Net Zero future.
- 2.38. Firstly, I must address the Net Zero future. WCM will be an integral part of this Net Zero future for West Cumbria, being a global leader as the first underground metallurgical coal mine in the world to be Net Carbon Zero in its operations.

- 2.39. Secondly, the mine will train and develop core skills and competences, fully aligned with accredited training schemes, which will equip local West Cumbria people with extensive transferrable skills, that shall be for the wider and longer-term benefit of the community as a whole.
- 2.40. Thirdly, the significantly higher level of salaries and remuneration packages, including pensions and other benefits, will ensure that local families have the opportunity to substantially improve their overall social wellbeing and economic status.
- 2.41. The argument presented by Ms Diski that WCM will “compete with” low-carbon construction jobs is very weak. There were 13,000 employees/jobs in the construction sector in Cumbria in 2019. The idea that WCM’s investment, concentrated in the next few years, will “crowd out” long-term investments in renewables or other low-carbon projects is bizarre.
- 2.42. There is no firm evidence as to any guarantee or expectation of when and if the green jobs cited in recent research presented by Ms Diski will in fact materialise nationally or more particularly, in the locality of Whitehaven. These would appear to be wholly dependent upon Government initiatives and funding, which is completely the opposite to WCM, which is 100% funding by private entities with no Government funding whatsoever to move into operation. Moreover, as stated elsewhere, this mine and its employees would make an important contribution to the government’s challenging plans for transition to net zero.
- 2.43. In relation to tourism, the Copeland Vision 2040 is exactly what the title suggests – one potential ‘Vision’ of the future. Ms Diski fails to provide any evidence to support her suggestion that the mine would impact in any way upon tourism aspirations, or the Cumbria coastal walk and the Coast to Coast walk. Indeed, WCM has committed to supporting the long-term security of the former Haig Colliery mining museum and to re-open this as a tourist destination, to be a supporter of the Copeland Vision. A world leading net zero mine is highly unlikely to have any negative impact upon the likelihood of tourists visiting the West Coast of Cumbria.
- 2.44. At para 6.1 of her proof, Ms Diski seems to seek to rely upon historical data, rather than the reality of the local hotspots within Whitehaven and surrounding areas, in terms of major socio-economic impacts and issues.
- 2.45. The graph below, taken from the LEP local skills report and sourced from the MHCLG Index of Multiple Deprivation, shows that both Copeland and Allerdale

have high rates of deprived neighbourhoods, indeed the whole of West Cumbria can be regarded in the same manner.



2.46. It is clear from the deprived neighbourhood data that WCM is in no way being contradictory, and in fact it is Ms Diski who is failing to acknowledge the reality of the situation at the current time. As I have stated above, I have sought to give the inquiry the most up to date figures for employment potential which has developed over the last couple of years since the original application and ES was submitted. However, Ms Diski presents no factual information to support her assertions that WCM is exaggerating claims or seek to offer alternative data to contradict WCM's stated position.

3. Professor Paul Ekins OBE

3.1. My rebuttal in respect of Professor Ekins's evidence is focussed upon, and limited to, his economic arguments, principally within section 3.

3.2. Other WCM witnesses will respond on separate aspects of Professor Ekins's evidence, including steel and metallurgical coal production, GHG emissions reduction, the UK and EU steel industries and future of steel production.

3.3. In para. 3.1, Professor Ekins states that coking coal falls within the category of 'normal goods', to which the law of demand applies. However, he does not go on, as he must also recognise, given his claimed experience and knowledge

of the metallurgical coal market, to further define that metallurgical coal is also a 'necessary goods'. Necessary Goods are goods that are considered essential and have a low elasticity of demand. Metallurgical coal is highly 'inelastic' because consumers rely on it as a necessity rather than a luxury.

In relation to para. 3.2, I agree that in normal situations expansion of supply does normally lead to some reduction in price, and therefore to some increase in quantity of the product purchased, making perfect substitution extremely unusual.

- 3.4. However, even in these circumstances, the production of a lower priced alternative often leads to displacement of the "marginal" – i.e. highest cost – supply that is currently being used to supply the market; otherwise there would be no reduction in price. Thus, I am of the view that Professor Ekins is over-reaching by denying that such displacement and/or substitution will take place at all (para. 3.3). Furthermore, where demand is inelastic, there may not be much, or even any, increase in the quantity of product purchased.
- 3.5. In addition to the inelastic nature of the coking coal market, it also has specific 'special and rare' aspects related to the distribution of suppliers, both from a geographic and scale perspective.
- 3.6. Metallurgical coal deposits are rare globally and restricted to a limited number of regions. Each of these regions also has specific coal quality types and parameters, such that not all metallurgical coal is equal to one another. For example, Australia has no high volatile coking coals, in the way that the USA does so – Australia has the best quality low volatile strong coking coals.
- 3.7. Further, the market is dominated by one or two major producers – in 2021 Wood Mackenzie forecast the top exporters of hard coking coal, by market proportion, as below:

Rank	Company	Market Proportion
1	BHP	29%
2	Teck	11%
3	Anglo American	6%
4	Glencore	4%
5	Coronado	4%
6	Alpha	4%

- 3.8. This clearly shows that the largest supplier, BHP, is equal in size to the sum of the next five exporters combined (who also add up to 29%). This demonstrates that almost 50% of the seaborne hard coking coal market is controlled by six producers. This clearly explains that the combination of inelastic demand and restricted supply sources and product types produce a very special and rare market.
- 3.9. Appendix 3 includes an EU Commission Staff Working Document regarding the European steel market and presents reference data in relation to the EU steel market, and top EU steel producers (reproduced in the table below).
- 3.10. This shows that the EU steelmaking market (and thus metallurgical coal demand) also has a large major producer, Arcelor Mittal. The next five in the EU add up to a further 25.7%.

Rank	Company	Market Proportion
1	ArcelorMittal	25.9%
2	Tata Steel	6.7%
3	Thyssenkrupp	5.8%
4	Voestalpine	4.8%
5	Riva	4.2%
6	Celsa	4.2%

- 3.11. Furthermore, Appendix 4 includes a response to a EU Parliamentary question regarding the future use of coking coal. The response (dated 3 August 2021) states *‘The Commission recognises the indispensable role of coking coal during the steel industry’s transition to climate neutrality.’* It further adds *‘Global demand for critical raw materials will continue to grow in the coming years. The EU should mobilise its domestic potential for both primary and secondary raw materials.’*

The action plan encourages Member States to identify mining and processing projects, investment needs, and related financing opportunities for critical raw materials in the EU, giving priority to coal-mining regions. Furthermore, the Platform on Sustainable Finance, a Commission expert group, is working on developing criteria for the mining, extractive and processing sectors for the EU Taxonomy.’

These latest and up-to-date comments from the European Parliament clearly show that the EU regards coking coal as a critical raw material and is promoting

the identification of new opportunities for such raw material supply. This evidence is completely different to the position adopted by Professor Ekins.

- 3.12. Also, the case of UK and EU use of metallurgical coal is already in many ways “demand inelastic” because of policy constraints that already limit the amount of fossil fuels that can be used in heavy industry.
- 3.13. As a further special factor, the EU Emissions Trading System (ETS) places a hard cap on emissions from heavy industry, such as the steel industry. Collectively, these industries are already constrained by the overall cap on emissions, and they are not able to emit more carbon than allowed by the cap. For every tonne of CO₂e emissions associated from the coking coal produced by WCM, as long as it is consumed in the EU, it will need to surrender one carbon emissions allowance. This will reduce the number of emission rights that can be used by other heavy emitters (e.g. cement kilns, district heating plants, oil refineries, gas- and coal-fired power stations, etc).
- 3.14. So even if the use of coking coal were to increase, emissions from the use of fossil fuels in Europe would not increase. Professor Ekins’s argument therefore must be directed at the environmental impacts of the use of metallurgical coal – not at its use as such. However, the arguments that he makes about supply-side impacts on the consumption of coal are not directed at emissions, they are directed against the use of the product. Emissions will not increase, because of the cap, even if the price of coking coal is reduced as a result of the supply (which I do not agree).
- 3.15. Furthermore, I would highlight to the Inspector that the case for “lock-in”, as set out by Professor Ekins, is also not a very strong one. The argument that the investment will “lock in” high-carbon production processes is based on the idea that the marginal cost of production is well below the long-run average cost of production – that is, the cost including the initial up-front capital investment (CAPEX).
- 3.16. Based on the WCM financial model, the undiscounted initial CAPEX costs are £326 million, whereas the lifetime undiscounted ongoing costs total £7,774 million.
- 3.17. Comparing on a discounted (or net present value (NPV)) basis, the share of total value accounted for by the CAPEX ranges from around 10% to 20%, depending on the discount rate used (ranging from 6% to 12%).
- 3.18. Although this obviously means that there is a lower marginal cost of production than long-run average cost, the difference between the two is not very large.

This is consistent with the findings of the attached 2015 paper from economists at the Stockholm Environment Institute, who found that in general coal investments were least prone to lock-in, compared to oil and gas (which have lower operation costs (Opex) relative to Capex). This paper is provided in Appendix 2.

- 3.19. Notwithstanding his role as an economist, Professor Ekins seems unwilling to allow market forces, through emissions trading, to help businesses and governments determine the most efficient way to distribute emissions across the economy. This is what carbon pricing and emissions trading does.
- 3.20. Also, at para. 3.17 Professor Ekins is not being very careful or measured in his language. The mine operator will not sell the coal “anywhere in the world that a market can be found”. It will only sell it into a market where the price is above the marginal cost of production (as the previous and subsequent paragraphs note).
- 3.21. At future carbon prices of €400/tCO₂ (E3M Figure A3.2), it would almost certainly be cost-effective to capture and store carbon from the coking / BOF process – so based on the information presented, it is not clear why CCS technology would not be used – apart from the assumption that zero-carbon H₂ and associated steel-making technologies are available at lower cost.
- 3.22. The IEA’s finding that a net-zero world does not need new developments of fossil fuels does not mean that there would be no benefit from developing new, lower-cost sources – even if the carbon costs are taken into account. There is no economic or environmental imperative against reducing costs and it is not virtuous to “use up” the coal in an expensive and higher emissions mine, rather than leave that coal in the ground and extract coal from elsewhere more efficiently and with fewer emissions.
- 3.23. The future costs of the steel decarbonization options are not currently known and should not be presented in a way that implies certainty about the future scenarios.

4. Professor Stuart Haszeldine OBE

- 4.1. Professor Haszeldine, in his Proof of Evidence at Section 1 (Introduction) sets out his role, background and experience. I cannot see or find any experience of underground coal mining, modern coal processing or the metallurgical coal and steel markets, that would provide the necessary knowledge and insight to be able to provide valid evidence in relation to metallurgical coal parameters,

coal processing technologies or market acceptance of metallurgical coal products.

- 4.2. I do note that Professor Haszeldine is the world's first Professor of carbon capture and storage (CCS). It is somewhat surprising that, given the extent to which other witnesses for the Rule 6 parties have sought to challenge the likely uptake of CCS and CCUS, and the potential for it to play an important role in future steelmaking, Professor Haszeldine has not provided any evidence on this issue.
- 4.3. I have spent the last 8 years immersed in the technical detail of the WCM project, including geology, exploration, analysis, design and final product specification. Over many years, I have met dozens of coal buyers representing leading steel making companies and have attended world class conferences and meetings focussed solely on metallurgical coal and steelmaking. I have visited operational, modern coal processing plants in various countries, including equivalent design and scale plants in the USA (including West Virginia). Finally, I have extensively studied modern equipment, suppliers and processes involved in the wide aspects of coal operations and have spent the formative years of my professional career working in the former UK underground coal industry as well as international mining and tunnelling projects.
- 4.4. In para. 2.1, Professor Haszeldine makes the first of numerous references to 'The Edinburgh Report' (TER). I wish to highlight to the Inspector that TER is not a peer-reviewed or validated reference which would command such a significant title. In fact, TER is a student project study, commissioned by SLACC, to 'examine the distribution of sulphur in coal seams of northern England'. I further highlight that there is no background information in relation to the experience or qualifications of the author of TER (named as Kate Adie BSc, MSc).
- 4.5. As a result, it is clear that TER is not a validated source of information that can be relied upon as being impartial in terms of presenting technical information regarding the suitability of WCM coal. Many of the references are more than 50 years old, which in relation to coal processing is extremely out-dated. I would therefore wish to suggest to the Inspector that very limited weight should be given to any of the claims within TER. This is highlighted by the fact that the opening section (Section 1) of TER is entitled as 'Problem Statement'.
- 4.6. Professor Haszeldine states that WCM has not released raw coal data despite requests for this information. However, he fails to acknowledge anywhere that it is simply not practice in the resources industry for mining companies to

release critical intellectual property information, such as extensive laboratory test data, due to the commercial market and need to secure the investment already committed to complete a major exploration programme such as that completed by WCM, with costs of more than £15m committed to obtaining that IP.

- 4.7. Also, Professor Haszeldine does not reference, or even seem to recognise, that all mining developers must engage independent 'Competent Persons' to assess and validate all raw data, interpretations and to 'audit' the work completed by the developer. Specific international codes of practice are utilised throughout the mining industry, in particular the JORC code which has gained international recognition and is the most frequently used code. The Competent Person (CP) assesses all aspects of the geology, product quality and parameters to assess the size, quality and extent of a mineral deposit; the CP must be an accredited and experienced recognised Professional.
- 4.8. The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the 'JORC Code' or 'the Code') sets out minimum standards, recommendations and guidelines for Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves. The Joint Ore Reserves Committee ('JORC') was established in 1971 and published several reports containing recommendations on the classification and Public Reporting of Ore Reserves prior to the release of the first edition of the JORC Code in 1989.
- 4.9. WCM has completed the independent CP process for resources and reserves. The statements by the CP confirm the presence of a large and economically viable deposit of hard coking coal equivalent to High Volatile 'A' (HVA) standard. In accordance with established market practice the details of such CP reports are for obvious reasons commercially confidential. Such reports are shown only to potential investors or buyers subject to a confidentiality clause and NDA. It is upon these documents that investment decisions in a proposed mine are made.
- 4.10. In para. 2.4, Professor Haszeldine asserts that his findings cast serious doubts on the key benefits that are claimed by the Applicant and County Council with respect to the suitability of the coal for UK and EU markets. I am in complete disagreement with Professor Haszeldine on this claim. The whole of his witness statement focuses solely and only on the sulphur content of the coal. It completely ignores and is entirely silent on all of the other key parameters which characterise high volatile coking coals. As a result, the views presented

by Professor Haszeldine are an extremely singular and distorted assessment of WCM coal quality.

- 4.11. In para. 3.7 of Professor Haszeldine's proof, he claims that WCM will not be able to process the coal to meet an achievable sulphur content, and as a result that would mean that the coal would not be marketable as premium HVA coking coal. I strongly refute this statement and will go on to demonstrate why Professor Haszeldine simply does not have sufficient knowledge of modern coal processing techniques and the factors which combine to produce a marketable HVA coking coal.
- 4.12. Section 5 of Professor Haszeldine's proof is importantly entitled 'Coal Sulphur Content and Potential Limits'. I would wish to highlight the use of the word 'potential', which is very important in the context of this section of Professor Haszeldine's evidence. There are many published sources which will provide 'guidance' on indicative ranges of parameters for different types of metallurgical and coking coals. It is important to note that the term 'metallurgical coal' includes specific coals that cannot be used for coke-making, such as PCI (Pulverised Coal Injection) coal and is therefore a more general term than 'coking coal'.
- 4.13. In para. 5.2, Professor Haszeldine notes that an independent expert mining consultancy, Wardell Armstrong (WA), commissioned by the Council, stated that their recommendation was that coal over 1.7% sulphur would not be categorised as HVA coking coal.
- 4.14. However, thereafter, Professor Haszeldine seeks to suggest that the upper limit defined by WA is not in fact acceptable, and so is implicitly stating that he disagrees with WA. This is a very significant position to adopt given that, as far as I am aware, Professor Haszeldine does not have the necessary professional qualifications or knowledge to challenge the opinion of a respected and reputable experienced mining consultancy business on this issue. Professor Haszeldine follows on, in Section 5.5, to further question the professional judgement of WA, simply because it does not align to the generic sources of indicative parameters as presented in the table within section 5.3.
- 4.15. Professor Haszeldine tellingly makes reference to the Platts coal quality data and presents a range (0.7% to 1.0%). WCM has an ongoing fully paid subscription to the S&P Global, Platts Coal Trader International, an industry standard newsletter issued regularly (typically three or four times every week) with current coal prices, relevant news stories and coal parameter rationale. He omits to include that Platts coal quality data charts are relevant to US LV coals, but also that the Platts index published adjustment mechanisms (\$ per

tonne) for sulphur over 1.1% (as well as other key parameters, including ash, Volatile Matter and moisture content). The adjustments are often utilised by commodity buyers to apply penalties and also premia for different parameters of a given coal, to adjust the base price accordingly. Further, WCM has incorporated into its financial assessments price adjustments for sulphur, as well as price enhancements for the positive aspects, including ultra-low phosphorus and very-low ash.

- 4.16. Furthermore, even though it did not consider that it was strictly necessary, WCM fully accepted a specific planning condition suggested by the Council imposing limits on the product coal specification (which included limits on ash and sulphur). That remains the case, and this condition has been included in the list of draft conditions which WCM is content to accept, should the Inspector consider that it is necessary to do so.
- 4.17. A key part of Professor Haszeldine’s evidence relates to the table reproduced in section 5.4. Professor Haszeldine relies heavily upon this table, which is a schedule of general quality ratings for washed, high-volatile, bituminous U.S. coking coal. Note that it states ‘general quality ratings’ and in no way suggests that these are hard limits or boundaries.
- 4.18. I have reproduced the table from section 5.4 below, and for the benefit of the Inspector, I have added in red outlines, the various WCM clean coal quality parameters as they would relate to these general quality ratings, together with the sulphur level Haszeldine seeks to wholly focus upon.

[Abbreviations and symbols: A/B, acid-to-base ratio; °C, degrees Celsius; CSR, Coke Strength after Reaction; daf, dry ash-free basis; ddpm, dial divisions per minute; °F, degrees Fahrenheit; FSI, Free Swelling Index; HGI, Hardgrove Grindability Index; max., maximum; red., reducing environment; R_mmax, maximum vitrinite reflectance in oil; ST, softening temperature; VM, volatile matter; %, percent; >, greater than; ≥, greater than or equal to; <, less than; ≤, less than or equal to. Note that these data are not applicable to unwashed coal or coal for use outside of the United States.]

Property	Poor to marginal	Fair to good	Very good to excellent
VM (% daf)	≥40	>34 and <40	31-34
Ash (% dry)	>8	>6 and <8	<6
Sulfur (% dry)	>1.3	>0.8 and <1.3	<0.8
Oxidation (%)	<87	>87 and <94	≥94
FSI	<6	>6 and <8	>8
Max. fluidity (ddpm)	<5,000	>5,000 and <20,000	>20,000
Plastic range (°C)	<75	>75 and <95	>95
Dilatation (%)	<100	>100 and <180	≥180
Sole-heated oven (%)	>12	-12--20	<-20
HGI	<42 or >80	≥42 and <55	>55 and <80
Ash fusion ST (°F, red.)	≤2,250	>2,250 and ≤2,575	>2,575
Ash A/B ratio	<3.5	≥3.5 and <6.0	≥6.0
P ₂ O ₅ in the ash (%)	≥1.2	>0.5 and <1.2	<0.5
Mean R _m max (%)	≤0.82	>0.82 and <0.98	>0.98
Inert content (%)	<15 or >35	15-20 or 30-35	>20 and <30
CSR (%)	<45	≥45 and ≤56	>56

Figure 7 General quality ratings for washed, high-volatile, bituminous U.S. coking coal. Source: summary table from (Trippi et al., 2021), originally compiled by (DeVannev and Mitchell, 2015)

- 4.19. This 'Figure 7' shows 16 (sixteen) key parameters used to evaluate the coal quality rating. The highlights added shows that WCM product coking coal sits in the 'very good to excellent' category for 11 of the 15 tests (note that the sole-heated oven test has not been part of the WCM testing regime), 3 tests in the 'fair to good' category and only 1 test that is within the 'poor to marginal' category - that one is sulphur. Thus, in proportional terms, 73% of the coal quality is in the highest, 'good to excellent' category; 20% is in the 'fair to good' and only 6% 'poor to marginal' categories.
- 4.20. Professor Haszeldine's sole focus is only upon the sulphur content of the coal; likewise TER has the same focus. Nowhere in his evidence does he mention or comment on the very positive qualities of WCM coal in relation to those aspects which are collectively crucial in terms of steelmaker requirements within their overall coking coal blend for coke production.
- 4.21. The most significant aspects of HVA which are sought after include low phosphorus, high fluidity, high Free Swelling Index (FSI) and low ash. Sulphur is an important parameter, albeit that many steel facilities have integral desulphurisation equipment to eliminate this as being of any impact to the final product steel quality and the approach to blending allows the steelmaker significant scope in terms of maximum sulphur.
- 4.22. Moreover, Professor Haszeldine makes no reference to the blending which all steelmakers implement to achieve their unique coking coal blend to produce coke. All coking coals are blended. For example, were WCM to have an average 1.4% sulphur level, a small proportion of low sulphur coal brings the overall blend sulphur easily within the steelmakers operational range for coke production. As a result, this is not a significant issue for steelmakers in the overall blend and attraction of WCM coals to steel customers, given other attractive parameters and project aspects (proximity, social, environmental).
- 4.23. In para. 5.7 Professor Haszeldine claims that WCM coal cannot be fairly represented as a 'supply of indigenous met coal to support the UK steel industry' of any significance. However, he fails to set out what the term 'any significance' would mean, when WCM is of the informed view that it could supply at least 20% of the required volumes used by the UK steelmakers.
- 4.24. Professor Haszeldine states in para. 5.8 that the EU coke range for sulphur is 0.5 to 0.9%. He further quotes 'mean' values of 0.4-1.1% sulphur for metallurgical coal. The 'mean' values clearly infer that material outside the range will be produced. As an example, if WCM coal formed 20% of a blend, the other 80% would be required to have a sulphur content of approx. 0.78% to meet the 0.9% coke range. This would be extremely practical to achieve,

given that the majority of Low Volatile coals also have inherently low sulphur levels (the Platts source which Professor Haszeldine quotes shows this to be below 0.6% for LV coal).

- 4.25. WCM has extensively published information in relation to the proposed mining plan and target coal seams. It is therefore disingenuous of Professor Haszeldine to infer, as he does in para. 6.2, that WCM has not included the names of the target coal seams; this information is readily available. For clarity, the target seams are the Main Band seam and Bannock Band seam; this information is readily available, including within the ES (Chapter 5 Project Description) and page 18 of the Woodhouse Colliery: Project Update brochure (dated January 2020) which can be downloaded from the WCM website and a dedicated page 'what research or evidence exists?' (<https://www.westcumbriamining.com/what-is-the-plan/what-research-or-evidence-exists/>) which discusses the role of Competent Persons and the target coal seams and provides a graphic of the coal seam sequence.
- 4.26. At no point in the assessment of historical data does Professor Haszeldine highlight, as per published historical evidence, that the Cumbria coalfield exhibits increasing coal quality progressively from North to South, with increasing depth of cover. WCM's licence areas are at the southern extents of the coalfield, and benefit from the improving coal quality trends as a direct result of these observed regional changes.
- 4.27. Given the above, undertaking analysis of historical data from beyond the WCM licence areas is of very limited benefit in terms of the proposed mine location. There are significant variations in coal quality regionally, due to the compressed nature of the Cumbrian coalfield deposits. Specific references below:
- 4.27.1 Boland M P, 1991. Analysis of fault patterns in Middle Coal Measures in an area south of Whitehaven, Cumbria. Unpublished BGS report to UK Nirex Ltd, SE/81JY/REP004.
- 4.27.2 Cavender P F, 1995. Sulphur distribution in key British coal seams and the trace element concentrations in sulphide minerals. British Coal Utilisation Research Association (BCURA) Research Project B20. Final Report, University of Sheffield.
- 4.27.3 Rippon, J H, 1996. Sand body orientation, palaeoslope analysis and basin-fill implications in the Westphalian A-C of Great Britain. Journal of the Geological Society, London, 153, 881-900.

- 4.27.4 Rippon J H, 1997. Geological controls on sulphur distribution in British Carboniferous coals: a reappraisal. Chapter 4 in: Variations in tectonic style and setting in British coalfields. PhD thesis University of Keele.
- 4.27.5 Spears D A, Rippon J H & Cavender P F 1999. Geological controls on the sulphur distribution in British Carboniferous coals: a review and reappraisal. International Journal of Coal Geology 40; 59-81.
- 4.28. Dr John Rippon, formerly senior geologist for British Coal and independent expert adviser to West Cumbria Mining, has undertaken extensive study work in relation to UK coal deposits and completed extensive review work in relation to the Cumbrian Coalfield. At no stage has Dr Rippon ever considered the sulphur content of the southern licence areas WCM seeks to mine to be of concern, especially given his extensive analysis of hundreds of historical underground mine and borehole samples he has assessed (many of which have been obtained from national archives).
- 4.29. The mean (average) data in TER is flawed and is not representative of the WCM licence areas at the southern end (deepest) of the offshore deposits. Claimed average sulphur levels are far higher than the results collected by WCM exploration and historical data reviews for the specific WCM licence areas. In para. 6.4, Professor Haszeldine seeks to present high sulphur ranges from a single point of data (Fig. 21 in TER, a u/g borehole from Haig colliery). WCM has access to dozens of full seam samples from Haig colliery u/g and the analysis of these presents significantly lower average sulphur content than the isolated example referenced by Professor Haszeldine.
- 4.30. Professor Haszeldine also fails entirely to recognise that WCM's selected mining method would accommodate the selective mining of in-seam horizons underground and be able to leave behind upper and lower bands of a seam if chosen to do so. Evidence across UK coal field deposits has demonstrated that higher concentrations of sulphur are observed at the top or bottom of the seam, together with explicit examples WCM retains in terms of Haig underground sample data showing concentrated sulphur at the base of the Main Band seam. In such circumstances our mining method would allow for this to be left in-situ and not mined in practice.
- 4.31. In para. 6.5, Professor Haszeldine then states that beneficiation will not decrease ash and sulphur to 'appropriate' saleable levels. I shall go on to demonstrate that the whole of Professor Haszeldine's section 7, in relation to coal processing, is flawed; I shall explain below in further detail why this is the case.

4.32. Professor Haszeldine places great emphasis and reliance on selectively chosen and historically outdated statements in relation to section 6.6 and 6.7. To suggest that West Cumbria coals have been recognised for many decades as being unsuitable for iron and steel making, because of their high sulphur content, is simply incorrect. In doing so, Professor Haszeldine appears to ignore the reality that Haig and other Cumbrian collieries consistently supplied all of their output to the Workington and other local iron and steel works, until the coke batteries closed in 1974. Until nationalisation in 1945, all of the mines were private enterprises, many of which were specifically opened and operated to supply coking coal to the local steel industry, given the proximity of very high-quality iron ore in West Cumbria.

4.32.1 Coal – Industrial History of Cumbria: <https://www.cumbria-industries.org.uk/a-z-of-industries/coal/>

4.32.2 Iron and Steel – Industrial History of Cumbria: <https://www.cumbria-industries.org.uk/a-z-of-industries/iron-and-steel/>

4.32.3 Coke in West Cumberland: <https://www.cumbria-industries.org.uk/a-z-of-industries/coal/coke-in-west-cumberland/>

4.32.4 Cumberland Iron and Steel production: <https://www.cumbria-industries.org.uk/a-z-of-industries/iron-and-steel/cumberland-iron-and-steel/>

4.32.5 Moss Bay Coke Ovens, Workington
<http://www.users.globalnet.co.uk/~rwbarnes/workqton/cokeoven.htm>

4.32.6 Cumbria Museum Archive display on British Steel, Workington
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiU1sPd2NiyAhXijKQKHUHjD4YQFnoECAMQAQ&url=https%3A%2F%2Fwww.cumbria.gov.uk%2Flibrary%2Fview.asp%3FID%3D46552&usq=AQvVaw1fqWsrq_C6vVtzIYbyMRNj

4.33. There is simply no alternative evidence that can be presented by Professor Haszeldine to suggest that Cumbrian coal was not used for steelmaking, with Workington steelworks being internationally famous for making the highest quality railway rails in the world for many decades, with the world's first fully integrated steelworks at Workington (Moss Bay) using blast furnaces and Bessemer converters pioneered by Sir Henry Bessemer.

4.34. Nowhere within Professor Haszeldine's evidence does he present any information to demonstrate that he has any experience, qualifications, industry exposure or other knowledge in relation to advanced and modern coal processing techniques, including plant design, construction and operation.

- 4.35. In para. 7.1 Professor Haszeldine refers to ‘the difficulties in removing it’ (sulphur). This is simply not the case, and there are hundreds of operational metallurgical coal processing plants globally which provide very effective sulphur reduction. There are a number of experienced coal process plant designers and providers globally, including (to name a few): Parnaby Cyclones (UK), Sedgman (Aus), The Daniels Company (USA), Multotec (Africa), GT Global (China) and Schenk Process (Aus).
- 4.36. Many plants constructed in the last decade by these companies specifically focus upon the processing of metallurgical coal, and the reduction of sulphur and ash. As such, developments in process plant design and efficiencies have been transformed since the end of the UK coal industry in the 1980s and 1990s. For example, the wash plants in Cumbria were at least 30 years old when closed in 1986. Thus, technological change has been enormous, and to seek to draw conclusions from former UK operations is mis-leading and out-dated, especially when the whole of the UK industry was focussed upon coal processing for the control of ash levels for input into electricity generating power stations.
- 4.37. The original WCM proposal (as designed by The Daniels Company, who specialise in metallurgical coal processing plants) was for a dense media, multi-stage coal processing plant. Nowhere in his evidence does Professor Haszeldine refer to the ‘dense media’ aspect of the plant design, which is in fact a crucial aspect and part of modern coal processing design and referred to within the ES and plant description, included within the April 2020 revised environmental statement application for process change.
- 4.38. Dense media refers to plants where powdered magnetite is used as an addition to the wet treatment circuit to enhance the apparent density of the (water) media, to enhance the performance in terms of gravity separation.
- 4.39. All coal processing relies upon specific gravity related aspects, in so far that in layman terms, coal floats and rock sinks. Thus, in all modern coal processing plants, wet treatment techniques are the basis and standard methodology.
- 4.40. The Daniels design, within the original planning submission, utilised a series of different stages and methods of coal processing to seek to separate as much sulphur from the run of mine coal as possible. Given that Cumbrian coal is very low in ash and phosphorus, the main focus for coal processing and improvement is purely related to sulphur. Nevertheless, sulphur mitigation methods also enhance and reduce ash as well, given that ash is also a higher density component of the ROM coal.

- 4.41. The Daniels design process involved extensive computational modelling, using raw coal input data, and demonstrated that it was practical to deliver a process plant to meet a 1.4% premium HVA product specification. That design also included output of a secondary product, which could be tailored by the operator to meet chosen limits on sulphur or other coal parameter limits.
- 4.42. Modern coal plants incorporate real-time coal quality monitoring equipment, to be able to continuously review ash and sulphur levels in the coal, as it passes through the plant. This is a core part of modern plant operation and final product quality control.
- 4.43. In para. 7.3 Professor Haszeldine seeks to highlight anomalies relating to the coal crushing maximum size. If Professor Haszeldine had any insight and experience of coal processing, this would be referred to as the 'ROM feedstock topsize'. Nowhere does he utilise industry standard nomenclature.
- 4.44. Further, the large majority (and all historical UK plants focussed on ash levels for electricity thermal coal) of global coal processing plants have a standard current operational topsize of no less than 20mm. Professor Haszeldine makes no comparison to standard practice. He further seeks to suggest that WCM's decision to move from 3mm to 6mm topsize would impact the ability to remove sulphur. This is not the case, and Professor Haszeldine again shows his lack of knowledge in relation to topsize, size distribution and ultra-fines produced by crushing.
- 4.45. WCM has performed extensive laboratory testing of recovered coal samples, including crushing samples to different topsizes, and analysing the potential washability performance and size distribution. A major challenge with crushing coal down to a very low topsize is the ability to dewater the coal effectively (e.g. final product moisture content) and the subsequent handleability of the product coal. WCM has also completed handleability tests to understand these specific aspects of the product.
- 4.46. The decision to shift to a 6mm topsize was a result of laboratory testing and plant design experts balancing the plant performance (in terms of sulphur levels) and the product size range and moisture content.
- 4.47. At no stage has WCM ever sought to represent the proposed product to be an ultra-low sulphur coal. However, it does, as a result of the coal processing, result in an ultra-low ash coal, with very attractive overall properties and acceptable sulphur content.

- 4.48. Para. 7.5 of Professor Haszeldine's proof demonstrates his lack of understanding in relation to how a coal processing plant operates and how the plant can be controlled in terms of key input and output parameters. If Professor Haszeldine had any relevant and current knowledge of modern, metallurgical coal treatment methods, he would not state 'it is not clear how the cap will be designed into the process or whether the process is the same as that proposed at the time of the Oct 2020 committee meeting'.
- 4.49. Amazingly, Professor Haszeldine seeks to utilise a quote from Parnaby Cyclones' website to evidence that they do not guarantee any reduction of sulphur content in coals. This is a very weak attempt to present a generic website reference, and support it with TER outdated reference to sulphur reduction. Note that within TER there is reference to coal processing plants delivering sulphur reduction of between 30 to 40%.
- 4.50. Parnaby have provided formal design and plant flowchart (input and output data) information that clearly demonstrates that their plant design for Woodhouse Colliery would deliver significant sulphur reduction.
- 4.51. The latest Parnaby updated process is simply an evolution of the previous process design. It is a dense medium, multi-stage separation process. It utilises a series of well proven and highly efficient techniques, in combination, to separate the highest proportion of sulphur as practicable to do so. It uses screens, primary and secondary cyclones, spirals, centrifuges, and column flotation to undertake multiple stages of treatment.
- 4.52. The plant would produce two outputs streams, both being metallurgical coal. The primary output stream would be less than 1.4% sulphur. The secondary would be less than 1.6% sulphur. This would enable WCM to meet the planning condition of mean sulphur of 1.4% and a maximum of 1.6%. All other material will be passed to the reject stream, where it is dewatered and prepared for disposal underground within the worked out mined panels. The plant would incorporate modern real-time feed coal quality monitoring (via in-situ online analysers) to show ash and sulphur levels at various points throughout the process. Very fine control of media density will also be undertaken using radiometric density meters for monitoring of the coal separation processes.
- 4.53. As a result, there are no material changes or impacts, as claimed by Professor Haszeldine, in para. 7.6. The plant design has witnessed careful and thoughtful design evolution, including the introduction of state-of-the-art column flotation cells to significantly enhance the ultra-fine coal portion treatment and recovery.

- 4.54. At an average ROM coal feed into the plant having sulphur content of ~1.9%, even a conservative level of sulphur reduction of 30% through the multi-stage dense media plant, the output product would have sulphur content of 1.33%. It is clear, even from TER, that WCM coal can be readily processed to produce a product which is well within the limits WCM has imposed – indeed even a 26% plant reduction level would produce a product of 1.4% sulphur.
- 4.55. Professor Haszeldine also fails to recognise that the process plant output can be varied and changed to suit input ROM coal quality, and to produce specific clean coal quality parameters. This is achievable by the dual stage design of the plant, with the ability to constantly adjust the density and performance levels of discreet elements within the plant, including the cyclones, spirals and flotation cells.
- 4.56. Professor Haszeldine provides helpful commentary in section 8, in that with his assumed 0.5% organic sulphur level (I agree that this element of entrained sulphur cannot be removed via coal processing) is the lowest achievable sulphur level in the product – further supporting the WCM design work which shows that significant levels of raw coal sulphur can be practically reduced via focussed and specific processing techniques.
- 4.57. There is no substance to the concern raised by Professor Haszeldine regarding acid mine drainage in relation to WCM. From the very outset, WCM has committed, a first in the UK industry, and innovative for global underground coal mines, to dispose of all process plant ‘reject’ material underground within worked out mining areas. It is totally incorrect to suggest that there would be any concerns or issues with surface pollution of groundwater and surface water (para. 8.2). There will be no such open stockpiles or long-term storage of material on the Marchon site. The reject material is treated through the process plant, including via presses to reduce moisture to produce a suitable material for input into the paste backfill plant. It is stored in covered structures to ensure no exposure to external elements – the covered areas having integrated drainage and water collection back to the process facility water treatment unit.
- 4.58. In para. 8.3 Professor Haszeldine recognises that cement is beneficial for the waste, and I can further confirm that cement consumption and costs are included within the WCM financial model, as an integral operational cost as part of the disposal process.
- 4.59. Once worked out mine panels have been backfilled with paste, the paste backfill will be a solid non-leaching material, which will be closed off completely by the construction underground of airtight barrier walls. This is a part of the

methane collection and management strategy but will also mitigate mine water flows from the worked out and backfilled zones.

- 4.60. In reference to section 8.4, and a full water balance, this was provided in Chapter 5 of the ES. As such, WCM has already completed detailed water balance assessments, and remains of the clear view that water consumption or disposal can be actively managed without any risks to the environment.
- 4.61. In para. 8.5, Professor Haszeldine again demonstrates his basic lack of insight in relation to the operation of a modern coal process plant. His assumptions regarding working hours and shifts are completely unrealistic. He goes on to state 'if water is recycled that requires exceptional 96% recovery'. WCM's plant has always been designed as a closed-circuit dense media plant, with the water being pumped, collected in tanks and passed through a dedicated high rate thickener, which recycles all of the feed water and separates fines to clarify the water for recirculation throughout the plant. The plant has an integrated water treatment facility which controls water quality via the addition of specific reagents within the operation of the process.
- 4.62. The only loss of water is within the reject stream, which is already treated via plate press to reduce moisture as far as practical to do so.
- 4.63. The WCM water balance demonstrates that the top-up water to support the plant operation is nominal, with a slight excess of available water (demand is shown as 261 m³/hr). This is a direct result of the assessments of water inflow into the mine (including from the Byerstead Fault) and the capture of surface water from rainfall, using the extensive water storage tank capacity incorporated into the site design.
- 4.64. Professor Haszeldine claims in para 8.9 that the ES should in some way be revisited due to his erroneous calculations in relation to the water balance (albeit he does not refer to demand, recycling, export or waste disposal as being part of this balance). His assumptions for plant recycling rates are not supported by any evidence, and his other claimed 'assumptions' are also totally unsupported and do not align to the information WCM has utilised from industry expert plant designers. If Professor Haszeldine was unclear about the water balance assessment he could have sought clarification from WCM on this, which would have avoided the need for this unnecessary response.
- 4.65. In his conclusions, Professor Haszeldine suggests that 'all the evidence I have reviewed' results in his statements regarding sulphur levels and sales into Europe and global markets. Unfortunately, as presented above, the evidence he is quoting is flawed, outdated and not relevant in relation to the state-of-the-

art in coal processing technology, including dense media, multi-stage, closed circuit treatment process plants that have demonstrable abilities to deliver at least 40% sulphur reductions from ROM coal where high concentrations of pyritic sulphur (as within the Cumbrian coalfield) exist.

- 4.66. Wood Mackenzie (Jim Truman) have presented in their evidence analysis of commercial sales and recognition of sulphur related penalties, as well as premia for other positive aspects of WCM metallurgical coal.
- 4.67. Professor Haszeldine remains completely silent on the issue of coal blending, practiced by all steelmakers to meet their own unique coke oven input blend requirements. This provides significant latitude for steelmakers to source different grades and types of coking coal to provide the optimum value in use for their requirements, with an overall target on multiple parameters for their coking coal blend, as highlighted earlier.
- 4.68. In para. 9.2, Professor Haszeldine states that WCM product coal will not be classified as a HVA coking coal. The evidence presented above, and separately by Wood Mackenzie, demonstrates that this conclusion is flawed and incorrect. Also, I note that Professor Haszeldine does not propose or make any suggestions as to the classification he would attribute to WCM product coal.
- 4.69. There is no evidence whatsoever that WCM would seek to exploit other coal seams. Nonetheless, if other seams were shown to have attractive properties that are able to meet WCM's coal specification, there is no reason to exclude these from the available potential coal resource.
- 4.70. In para 9.4, Professor Haszeldine states that his evidence proves that a HVA coal must have sulphur less than an average of 1.1%. This is simply not the case, and the evidence of Wood Mackenzie and my direct engagement with the raw commodity buyers for steelmakers confirms that this is not at all the case.
- 4.71. Professor Haszeldine demonstrates throughout his evidence that it is wholly reliant upon The Edinburgh Report which, as discussed above, fails to provide any relevant details of the expertise of its author. His evidence is therefore built upon weak foundations, and he provides no further evidence of industry knowledge, experience or involvement in relation to modern coal processing, or the inability of the proposed WCM plant designs to deliver the independently designed and verified plant performance and product outputs.

4.72.

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order 2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation To

The Planning Application Reference 4/17/9007 For Application For Development Of A New

Underground Metallurgical Coal Mine And Associated Development To Be Located At

Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

APPENDIX – WCM/MAK/4

This is the Appendix marked WCM/MAK/4 referred to in the Rebuttal Proof of Evidence of Mark Kirkbride dated 31.08.2021 on behalf of West Cumbria Mining Ltd

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Document 1

This is document 1 referred to in the Appendix marked WCM/MAK/4 on the Rebuttal Proof of Evidence of Mark Kirkbride dated 31.08.2021 on behalf of West Cumbria Mining Ltd



Local Skills Report

2021

CLEP

CUMBRIA
LOCAL
ENTERPRISE
PARTNERSHIP

NORTHERN of
POWERHOUSE Local Government



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Foreword by Chair – **Mike Smith OBE, LEP Board Member**



Cumbria's £12 billion economy has an unusual polycentric industrial structure with strengths in agriculture/land-based industries and tourism on the one hand and in food manufacturing and nuclear and advanced manufacturing on the other.

The Skills Advisory Panel (SAP) for Cumbria has brought together information and intelligence about skills successes, needs and challenges and works closely with leaders from across Cumbria's economy and vibrant education and skills system.

The progress made has been significant, building on the Cumbria LEP Skills Investment Plan, eight sector skills plans and developing a skills evidence base that supports the priorities set out in the people section of the draft Local Industrial Strategy.

The strategic imperatives relating to people set are reflected in the data and intelligence analysed to develop this report and can be summarised as follows:

- A declining working age population
- A thin pool of higher-level skills; and
- Cold spots of worklessness and deprivation

In response the SAP has developed a set of 5 priorities to address the challenges that underpin the strategic imperatives. These priorities are:

- Making the best use of available talent
- Developing and retaining higher level skills in our economy
- Creating the future workforce and skills to meet the needs of our economy
- Developing our future leaders and managers; and,
- Addressing worklessness and youth unemployment

The SAP has also developed a range of interventions to deliver on these ambitions and provide a focus for innovative partnerships between employers and education/skills providers, to support workforce and skills development across the County.

These partnerships have never been more needed. With changes to the labour market emerging at the end of the EU transition period and the impact on the economy of the Covid-19 pandemic the SAP has recognised that young people are increasingly concerned about their futures, employer's skills needs are changing rapidly, unemployment is rising and the skills system is facing unprecedented challenges in providing support to learners as well as employers.

These challenges, however also present opportunities for employers and the skills system to work

together to develop an offer that responds to the critical needs set out above but also the changes brought about by digitisation and the increasing drive to develop 'green jobs' in our economy.

The ability of the SAP to bring together intelligence from across the economy and skills system and develop responses to emerging challenges has been evident in our drive to simplify a complex skills and advice offer to enable individuals, communities and employers to benefit from the high-quality skills offer across our county. This report also builds upon the Business and Economic Response and Recovery Group of the Local Resilience Forum's "Restart, Reboot, Rethink - A Plan for Cumbria's Economic Recovery".

The conclusions emerging from the analysis of the skills landscape in this report are critical in driving improved productivity and growth across the economy. These are:

- the communication of careers and careers pathways are essential to developing, retaining and attracting talent to Cumbria
- continued targeting of provision needs to be developed to ensure that skills and employment support reflects the changing labour market
- continued development of the higher-level skills offer.

I am particularly delighted that we have been able to consult in the development of this report with young people who will form the workforce of the future and Cumbria's future leadership. Their thoughts and views are critical to the development of the work of the SAP and we will continue to ensure our talented young people contribute to the development and implementation of the SAP's priorities.

Finally, the SAP recognises that this report is just a starting point. It identifies needs and strategies. It proposes actions. It looks back at what has been achieved and looks forward to what must be done to continue our aspiration for inclusive growth at a time when there are significant changes in the labour market and the skills needed for employment. The details in this report have been developed in partnership with employers, young people, schools, Colleges, Universities, voluntary and community sector, private training providers and Government Departments. As the economy recovers, as our employers look to develop their workforce, as our young people look beyond uncertainty and to their future careers and as individuals look to gain employment, the SAP will continue the conversation with our partners in order to secure the on-going development of skills needed to support the Cumbrian economy.



CHAPTER 2 - Introduction



Cumbria matters. Our economy generates £12 billion annually, we are home to 500,000 people and attract some 47 million visits per annum.

We fulfil a number of unique functions that make our polycentric economy significant nationally, namely our:

- Unique geography and vital location
- Special environment and strategic resources
- People, business and economic assets
- Major investment opportunities.

Cumbria has a complex and unique economic geography. As the 8th largest LEP area geographically (at 6,800 sq. kms) combined with a relatively low population, Cumbria overall has the lowest population density and economic output density (GVA per hectare) of any LEP area. Cumbria therefore has genuine space to grow.

Our geography is not without its challenges: population and businesses are dispersed across Cumbria and travel to work and learn distances across different functioning economic areas are longer and more complex than in urban environments.

Cumbria sits at the heart of Britain – on vital cross-roads between England and Scotland, supporting critical north/south (M6/West Coast Mainline) and east/west links (A66 and A69).

Our close and historic ties to Scotland are reflected in the Borderlands Inclusive Growth Deal and in the daily flows of workers, shoppers and visitors between southern Scotland and north Cumbria. Carlisle acts as a sub-regional centre for a large part of the Borderlands geography (covering all of Cumbria, Northumberland and south Scotland). Cumbria is playing its full part in the Borderlands Inclusive Growth Deal providing strategic investment proposals related to digital infrastructure, renewable energy, place-making, better business premises, enhancing the higher education offer and knowledge exchange.

South Cumbria has strong housing and labour market links with northern parts of Lancashire – especially Lancaster – with a history of cross-border economic development activity around the



Morecambe Bay area. Lancaster University is closely involved in Cumbria, working in partnership with the University of Cumbria. Lancaster, South Lakeland and Barrow are working together on producing an Investment Plan for the Lancaster and South Cumbria region around Morecambe Bay, building on strengths in skills, energy, world class manufacturing and tourism.

The understanding of the skills needs and offer across the County is critical as Cumbria is the most self-contained LEP area in terms of travel to workflows (at the level of the overall LEP area). According to the 2011 Census, 96% of Cumbria's residents worked in Cumbria and 94% of all jobs based in Cumbria were filled by Cumbrian residents. However, the County does not function as one single travel to work or functional economic area. The size and typography of Cumbria means that the county has a series of overlapping economic and housing areas centred on our main towns and city. The impact of technology and the current environment may have an impact on this that the skills system will need to consider.

Skills Advisory Panels: the national and local context

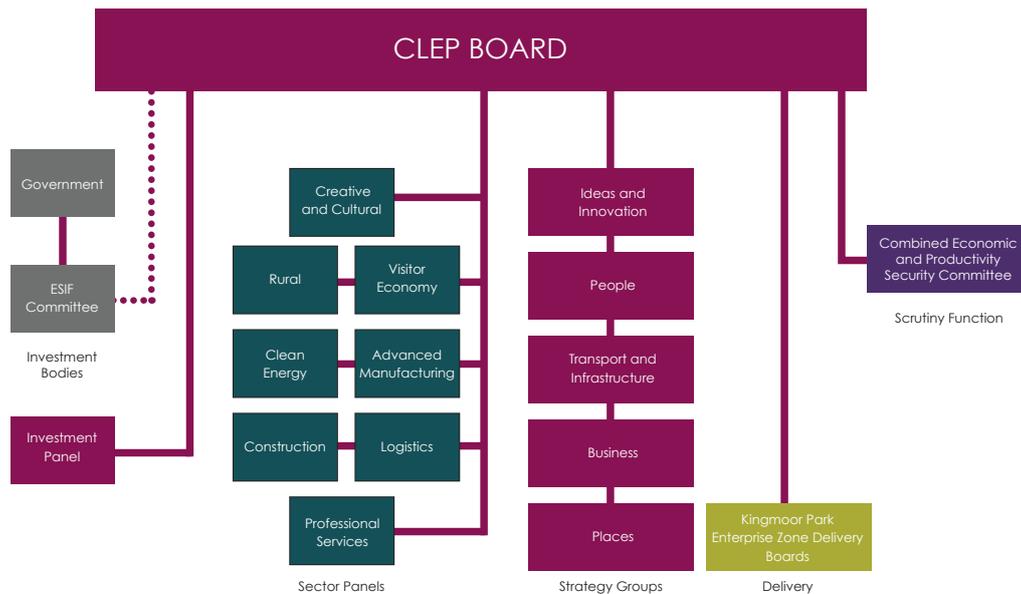
Skills Advisory Panels (SAPs) bring together employers, skills providers, and key local stakeholders to better understand and resolve skills mismatches at a local level. There are 36 SAPs across England as part of Mayoral Combined Authorities and Local Enterprise Partnerships.

The Department for Education (DfE) supports SAPs with grant funding primarily to produce high quality analysis of local labour markets and [Local Skills Reports](#). The Reports set out the local strengths and skills needs and how the SAP proposes its area addresses its key priorities. The Reports aim to influence local partners and feed intelligence to central government, including the national-level [Skills and Productivity Board](#) (SPB).

In January 2021, DfE published its White Paper "[Skills for Jobs: Lifelong Learning for Opportunity and Growth](#)," which set out a number of reforms aimed at putting employers more firmly at the heart of the skills system. The White Paper outlined plans to test in 2021-22, in a small number of areas, "Local Skills Improvement Plans" created by business representative organisations.

The White Paper committed to build on the work of SAPs to date. SAPs and their Local Skills Reports will continue as the DfE trailblazes "Local Skill Improvement Plans" and until any potential changes are made to a SAP's remit and responsibilities.

The role of the Skills Advisory Panel in Cumbria is delivered by the Cumbria LEP People, Employment and Skills Strategy Group (PESSG), and this is the thematic arm of the Cumbria LEP Board for all employment, education and skills related issues and provide advice and recommendations to the LEP Board on future investment in line with the current and future needs of the Cumbrian economy.

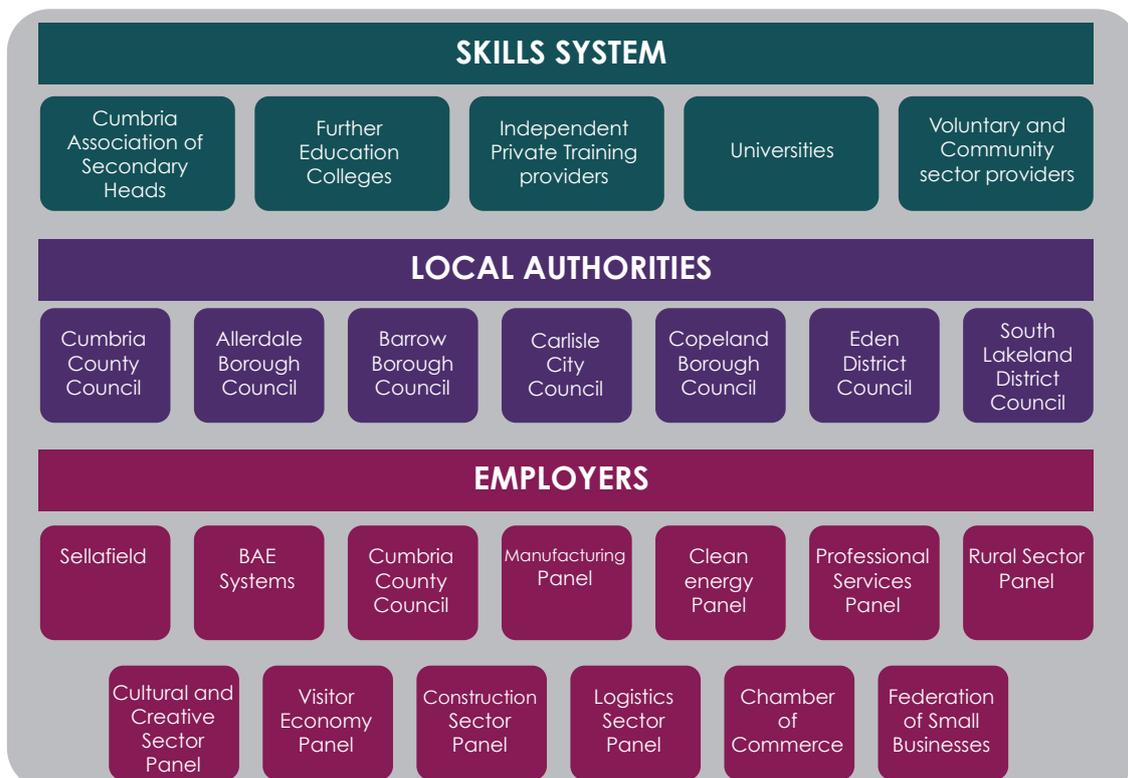


The SAP draws together leaders from employers, schools, Colleges, Universities, independent private training providers and voluntary and community sector organisations across Cumbria.

It provides guidance and support to the skills system to tailor provision to the needs of the current and future workforce to facilitate sustainable and inclusive economic growth. It works with businesses to understand their employment and skills needs and encourage the continued upskilling of individuals to drive productivity and business growth. The SAP champions inclusive growth ensuring that nobody is left behind and effective measures to tackle worklessness are in place.

The membership of the SAP is, therefore, necessarily wide and reflects the specific geographies and distinct economies within Cumbria.

The membership of the group can be demonstrated as follows:



This model places employers at the heart of the system, providing high quality intelligence and support to a skills system that has demonstrated its ability to respond.

In addition to the involvement of employers at all stages of strategy and plan development, the Cumbria SAP model also includes the voice of young people as the SAP includes representation from the Cumbria LEP Futures Forum.

As detailed in the Executive Summary, a key priority for the SAP is the development of the future workforce. It is therefore critical that our workforce of the future is able to comment on the development and delivery of SAP work. The Cumbria SAP has representation from the LEP Futures Forum, a group of young people who support the LEP in the development of its strategies and plans. In addition, the SAP also has also met with other young people to gather their views on the development of the Local Skills Report.

The SAP meets usually on a quarterly basis, however during the pandemic the group has been meeting more frequently. In the early stages this was weekly as challenges to the continued delivery of skills to employers and young people were identified, with employers and the skills system working together to support learners and ensure progress was maintained.

To maximise contributions to the work of the SAP, the work programme of the group is co-ordinated with that of employer and skills system groups. This is secured through the LEP Head of Skills and SAP members attending each Sector Panel and LEP Strategy Group, being a members of the Work Based Learning Provider Forum and the County's Children's Trust Board.

Details of the progress made with this report and skills strategies can be found here:

<https://www.thecumbrialep.co.uk/skills/>

If you are interested in getting involved in developing Cumbria's skills offer contact:

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Chapter 3 – Skills Strengths and Needs



Summary

Cumbria has strong and effective partnerships between employers and the skills system to secure the skills the county needs.

At a time of rapid change across the economy the need for these partnerships has never been greater to ensure that the skills offer reflects the changing demand for skills as a result of economic change, a declining working age population and the demand for increased higher level skills.

Cumbria LEP receives quarterly projections from Experian since before the pandemic and these are explored in more detail in Annex B but in summary, the pre-pandemic projections suggested a relatively static economy in Cumbria compared to growth nationally. When pandemic impacts are factored in, they show a sharper decline in Cumbria and slower recovery, largely due to Cumbria's reliance on the hospitality sector, together with the pre-existing slow rate of growth.

Whilst much of the local manufacturing base has been protected to some degree from the worst economic impacts of Covid-19, the same cannot be said for the substantial visitor economy which has been hugely impacted by repeated closures and travel restrictions which have effectively seen the sector endure "3 successive winters". The extensive use of furloughing, with parts of Cumbria consistently having the highest rates in the country, is evidence of the impact on the sector and its workforce and the reliance of other sectors in the county on trade from the visitor economy has also been exposed by the pandemic. Migration changes resulting from the UK's exit from the EU present a further challenge for a sector which has traditionally relied on overseas workers at peak times.

This has implications for the skills system to produce both new skills required by employers and employees but also the skills needed by employers facing a loss of skills through a declining working age population.

In addition to the skills strengths and needs set out in this chapter, there is an imperative to ensure those potential entrants to the workforce understand the opportunities available and the pathways into those opportunities. This will require employers, the skills system, Careers Hubs and the National Careers Service to work together to ensure young people, unemployed residents and those considering career changes have access to simple, high quality, relevant careers and pathway information to help them make informed decisions about the opportunities available in the county.

Finally, to enhance the skills available to the sectors in our unique economy, partners, including the Cumbria Local Enterprise Partnership, are working together to promote opportunities for careers and employment within Cumbria beyond the county.

The SAP has clearly set out the skills strengths and weaknesses of the county:

The challenges include:

- A declining working age population;
- A small pool of higher-level skills, and;
- Cold spots of worklessness and deprivation

The implications of these challenges are that employers report skills shortage vacancies where they cannot source the skills and talent they need, and they face increased workload, higher operating costs, and challenges in introducing new working practices.

This situation is likely to become more acute with the needs to develop have a direct impact on productivity, particularly when aligned with the need to develop new skills for emerging technological change and new legislation.

Consequently, the analysis suggests particularly high concentrations in education, transport and storage and construction. However, the impact of the declining working age population can be seen in several other sectors and occupations with employers looking to replace over 86,000 roles over the next 10 years. Whilst every sector and occupation will require skills to be replaced, the following occupations have replacement demand rates above the average for the county:

- Corporate managers and directors
- Health professionals
- Health and social care associate professionals
- Caring personal service occupations
- Teaching and educational professionals
- Business, media, and public service professionals
- Skilled agricultural and related trades
- Leisure, travel, and related personal service occupations
- Transport and mobile machine drivers and operatives

There will also be significant replacement demand for administrative, sales and public service occupations.

This is re-enforced by the analysis of growth sectors and occupations which suggests growth in the following areas:

Growth Sectors	Growth Occupations
Arts and entertainment	Caring personal service occupations
Information technology	Customer service occupations
Professional services	Health & social care associate professionals
Health and social work	Corporate managers & directors
Real estate	Business, media & public service professionals

In addition to the analysis of growth sectors and occupations the LEP Sector Panels and partners have identified a range of occupations where recruitment is challenging, and skills are in short supply. These include:

Sector	Role
Visitor Economy	Food and beverage professionals
	Chef
	Restaurant Manager
	Hotel Manager
Advanced Manufacturing	Production and process engineers
	Control and Automation including remote handling, adaptive control, intelligent autonomous systems, and control networks/logic controllers.
	Mechanical and Electrical Design. 3D CAD & Modelling, Structural Analysis & FEA, Virtual modelling and Thermo-fluid systems.
	Electronics Engineers
	Electrical and Electronics trades
	Mechanical Engineers
	Quality Control and planning
	Welding
Construction	Civil Engineers - including structural analysis and design
	Civil Site Managers- including building site management and project management
	Quantity Surveyors
	Electrical Power Technicians and Engineers
	Scaffolders
Clean Energy	Waste Management
	Waste Characterisation
	Innovative decommissioning technologies/techniques
	Nuclear safety case design
Rural Sector	Agricultural engineers – especially Agri-tech technicians
	Countryside conservation or estate management professional
	Arboriculture
	Commercial landscapers
	Heritage skills professionals
Healthcare	Medical Professionals
	Psychologists
	Nurses
	Radiography / therapy
	Occupational Therapist
	Paramedics
Professional Services	Purchasing, IT, HR, Quality, Project Managers
	Asset & Facilities Managers - including asset performance and analysis, asset management & sustainability
	Safety, Health and Environmental professionals
	Teachers

In addition to the specific occupational challenges detailed above, the SAP has also identified the need for enhancements to the skills offer to support the development of skills that would support every sector of the economy:

- Leadership and Management
- Digital Skills – both productivity level skills e.g. Word, Excel, and industry specific higher-level digital skills and
- Digital Marketing

Workforce Change

Cumbria has seen barely any growth in total population over the last 25 years (11,700 or 2%) and indeed the total population peaked in 2008 and has since fallen slightly. In the rest of the North West and nationally there has been much stronger population growth.

The population of working age (16-64) has been contracting and fell by 21,000 or 7% over the last 10 years. This is the fastest rate of decline of any LEP area, although within this age group there exists a complex picture with growth in some age ranges.

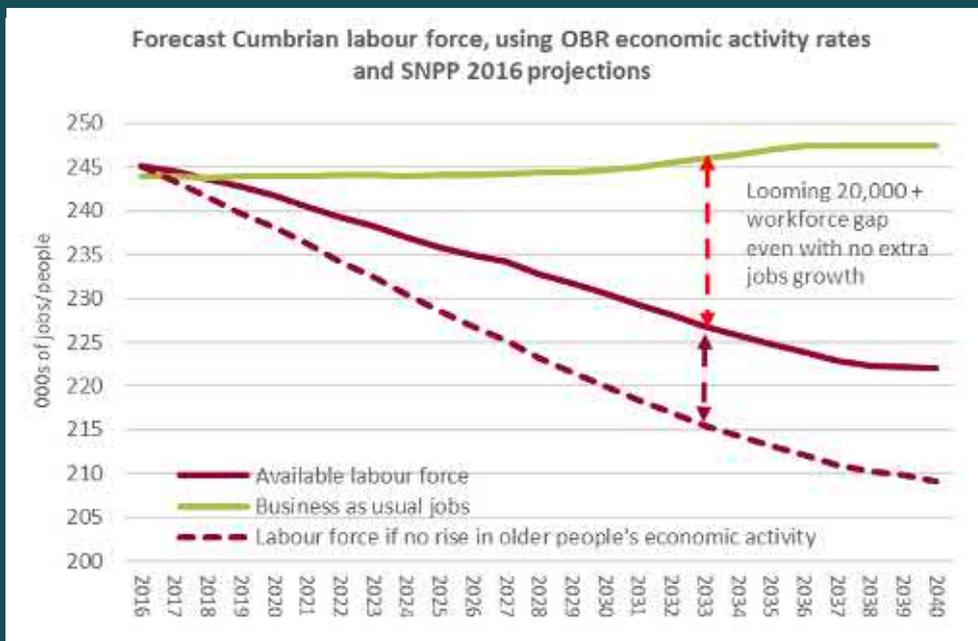
The latest official projections are for continued population decline with total population falling from the current 497,000 to 490,000 by 2030. The projected overall population of working age (16-64) could fall by 7% (20,000) over the 10 years to 2028 and by 11% (33,000) over the 15 years to 2033. However, this is likely to be offset to some degree by increases in economic activity rates for those over 60, particularly women.

The overall available labour force is projected to fall by over 20,000 over the next 15 years in the absence of a change in current population trends. Within the overall total, older workers will become much more important.

Even with employment remaining at current levels and very modest jobs growth, the current trends projected forward are for a steady reduction in the available workforce in Cumbria.

The effect of the assumed growth in economic activity rates for those over 60 offsets the decline in core working age population (by around 10,000 people by the 2030s). However, it is important to stress that these rises are not guaranteed.

Even with this growth, based on the latest official population forecasts the available labour force will fall by 16,000 to 2032, increasing to a fall of 22,000 by 2037. This takes place in the context of an already very tight labour market in Cumbria.



Source: ONS population projections 2016, OBR economic activity rates

Higher Level Skills

Cumbria has by far the smallest pool of residents qualified to Level 4 or better (degree level) of any LEP area with around 92,100. This is around 32% of all those aged 16-64 which is one of the lower rates in England. However, the relatively low rate coupled with Cumbria's geography (and relative isolation from other areas) means that the effective pool of higher-level skills is very modest overall and within each travel to work geography. This means that the labour market for higher level skills is particularly "thin", creating an issue for employers and in attracting people to live and pursue a career in Cumbria.

The factors that explain the use and prevalence of higher-level skills (as proxied by qualifications) are largely the sector and occupational mix in Cumbria with the pattern of NVQ4 qualifications by sector closely matching that at a national level in most sectors. Exceptions are manufacturing with a higher rate locally reflecting the high level of skills in sectors such as nuclear and shipbuilding; conversely ICT, finance and professional/technical services have notably a lower proportion of graduate level qualifications locally. These are also the private knowledge-based sectors where relative productivity is lower than nationally. So we can see that the proportion of higher level skills in the Cumbrian economy is partly a composition effect (importance of sectors with relatively low rates of people with NVQ4 (such as tourism and agriculture)) and also a below average rate within the private sector knowledge based service sector.

Strengths and Weaknesses

At broad occupation level, the largest occupations among residents in Cumbria are professional occupations (19%) and skilled trades (15%). This reflects the concentration of manufacturing employment in Cumbria with the latter being the second highest concentration of any LEP area.

Cumbria also has relatively higher shares of residents working as process, plant, and machine operatives and in elementary occupations than nationally.

Conversely, despite the local proportion of professional occupations, this is lower than the national average and there are also lower proportions of residents working in associate professional and technical occupations, and administrative and secretarial occupations than nationally.

As noted above, Cumbria has a lower proportion of its workforce qualified to NVQ4 or higher. However, the proportion of the workforce with NVQ level 3 qualifications is higher than average which reflects the importance of manufacturing and skilled trades in the county. Over the past decade there has been a shift towards higher skill levels among the working age population in Cumbria.

An analysis of the skills offer also indicates that the offer is broadly aligned to the needs of employers:

- A degree level offer that supports growth sectors and skills shortages within the economy
- A greater proportion of young people entering higher and degree level Apprenticeships at the end of Key Stage 5 than the national average
- Level 4+ starts in Community Learning, Apprenticeships and Education and Training for learners whose home geography is Cumbria have risen by a third
- Over 60% of Apprenticeship starts are at level 3 and 4
- The learning aims analysed align closely with the key sectors of the economy with the largest 3 sector subject areas being Engineering and Manufacturing, Health, Public Service & Care and Business Administration and Law

Chapter 4 – Skills Strategy

Chapter 3 of this document set out the skills strengths and needs of the county as identified by the SAP. These strengths and needs have been considered by the SAP and Cumbria LEP's broader governance structure including our eight employer panels and five strategy groups.

The SAP has worked with partners to develop strategies to deliver on our ambitions of growing Cumbria's talent pool and ensure all residents contribute by sharing prosperity and opportunity. These strategies are aligned to the challenges set out in the previous chapter:

- Declining working population
- Thin pool of higher-level skills
- Cold spots of worklessness and deprivation
- The strategy encompasses the following elements

Making the best use of available talent

The decline in our future workforce needs to be addressed and the LEP's strategy groups are working with partners to help attract more people of working age to Cumbria.

However, the SAP has identified areas related to skills development and recruitment which can help maintain or increase our workforce, focusing on:

- Our older residents/workers.
- Our workless residents (see below).
- Provision of new/innovative paths for careers and education
- Young people who leave the county.

Older people over 60 will become, in both absolute and proportional terms, an increasingly important part of our actual and potential workforce, given the decline in working age population. This will involve developing and building on existing interventions as part of a fuller working lives strategy. There are opportunities to:

- Work with employers to encourage them to consider recruiting and training/developing older people
- Provide suitable support and training for those seeking to re-skill
- Use links into the voluntary and third sector to help recruit older workers
- Ensure that suitable flexible working opportunities are offered in all sectors
- Explore how to tap into the experience and skills of those not wishing to work full time or in paid employment



The actions underpinning this element of the strategy are set out in the following chapters. However, these actions need to reflect some cross-cutting themes.

Firstly, in attracting old people into the workforce there may be a need to connect opportunities, providing opportunities for partners within the County.

Secondly, the provision of a range of information to highlight the opportunities for reskilling for older residents and workers and the routes into these opportunities

Thirdly, the development of modular skills programmes to facilitate flexible delivery to this group.

Develop and retain higher level skills in our economy

The thin pool of higher-level skills in Cumbria is recognised as a barrier to improved productivity and progression.

There are examples of partnerships of employers and skills providers working together across the County to extend the higher education offer to fully reflect the needs of the economy, demonstrating a shared ambition to attract and retain graduates as well as up-skilling the existing workforce.

Examples of these partnerships include:

- University of Cumbria's Project Academy with Sellafield Ltd (see case study)
- University of Cumbria's Institute of Health
- The growth in Higher and Degree Apprenticeships
- Partnerships between further education providers and universities

In addition to these the SAP has also supported the development of a bid for an Institute of Technology to support the Healthcare and Manufacturing sectors.

As the offer continues to grow there is also a need to promote the full range of HE opportunities to young people, highlighting the range of career opportunities on offer and encouraging younger people to build rewarding careers in Cumbria.

The rates of progress into higher education vary widely across Cumbria and there is a need to make young people (and those in the workforce) better aware of the opportunities and benefits from obtaining higher levels skills and qualifications whether through full-time traditional study or alternative routes including degree apprentices etc. The Cumbria Careers Hub's partnership with Hello Future (Cumbria's Uni Connect Programme) will promote the higher education offer to young people across the County, reflecting the breadth of the offer and the progression routes into opportunities. The SAP will continue to support partnerships between schools, further education providers and higher education institutions to encourage more young people to access high education opportunities e.g. Hello Future.

As well as increasing the number of residents developing higher level skills, we need also to develop a graduate retention/attraction strategy. This will have a two-pronged approach:

- First, continue to develop longitudinal relationships with those young people who leave Cumbria to study and then work elsewhere. This could build on existing alumni networks of individual school and colleges and develop Cumbria ambassadors and networks in major cities in the UK, supporting projects such as the development of the Cumbrian Award implemented by Beacon Hill Community School. The Cumbrian Award aims to support students in understanding about the benefits of living and working in Cumbria through exploring the local area in hope that students will share their reflections of Cumbria with other students whilst at Uni, and that they will be more likely to return

- Second, support the creation and promotion of graduate opportunities in our businesses and organisations to provide the glue to retain our graduates, potentially via graduate placements and secondments post degree.

Create the future workforce and skills to meet the needs of our economy

The SAP recognises the range of high-quality partnerships between employers and the skills system that deliver the skills needed by sectors across the Cumbrian economy. However, LEP Sector Panels and other partnerships have identified a range of roles where skills shortages exist, for example chefs, food and beverage workers and cross-sector skills shortages such as business and digital skills.

To build the workforce of the future the SAP and partners recognise the need to ensure that young people receive messages and signals about the economy and career opportunities that reflect a changing labour market and the changing skills required to secure opportunities within this labour market.

The strategy for securing the skills needed across our workforce and building the workforce of the future includes:

- Working with our sector panels and partners to understand emerging and current skills needs, and supporting our high quality, responsive skills system to enhance their skills offer to meet identified demand
- Supporting our schools, colleges and universities to enhance careers education and work experience across the county, effectively linking young people to the workforce
- Ensuring young people are equipped with the necessary digital and creative skills to support innovation in the future
- Supporting the system to help address the variations and gaps in attainment and progress which represent lost opportunities and talent for Cumbria.

Develop our future leaders and managers

There is considerable national evidence that the success of companies in improving productivity and engaging in innovative activity is in very large part due to the quality of and investment in the leadership and management of the business.

Cumbria's employers and skills system work together to develop a range of business management and leadership programmes to meet this challenge.

As the economy changes, so will the skills required of leaders and managers need to change and the challenge of developing digital leadership and management skills is becoming ever more critical.

The SAP has worked to develop the leadership skills focused element of the Cumbria LEP Digital Strategy and has collaborated with our Sector Panels to understand their leadership and management skills needs within sector skills plans.

This work has informed the development of programmes of skills support for future leaders and managers and will continue to inform the development of the skills offer

Address worklessness and youth unemployment

In engaging with workless households and communities that are not fully engaged with the labour market employers and the skills system have the opportunity to develop a workforce that has the

skills required to address needs identified above and also bring more people into the workforce. The challenge in doing this is frequently a range of skills and employment support programmes that are similar, duplicate the offer and not focused on the needs of the county, residents, or employers.

The SAP is committed to working with a range of partners to ensure the offer is simplified and recognises the different needs of a very diverse cohort e.g. some people will be a long way from the labour market and will need a considerable amount of support, whilst others will find themselves closer to the labour market and need a different level of support. This is particularly the case in the growth of the unemployed cohort as a result of the Covid-19 pandemic, and the recent increases in the group of young people not in education, employment or training (NEET). The strategy is to develop an offer that employers can access easily and meets the needs of their business, and one which provides access for residents at a point appropriate to their needs and facilitates progression towards the labour market.

The strategy is to develop an offer that employers can access easily and meets the needs of their business, and one which provides access for residents at a point appropriate to their needs and facilitates progression towards the labour market.

This will require innovation and collaboration across the skills system and with employers and community partners.

The skills strategy is also critical to the implementation of other LEP led strategy and plans.

Firstly, the LEP economic recovery strategy, Restart, Reboot, Rethink sets out the skills challenges contained within this report reframed to address the priorities emerging from the Covid-19 pandemic. This is reflected throughout this report

Secondly, Digital Cumbria – Connected, Capable and Creative: 2021 – 2026 sets out a strategy for digital transformation across the County. The strategy recognises that digital skills are imperative for an economy to thrive in the digital age. This spans inclusivity, so that people can access digital applications in everyday life, through to higher-end skills, so that a talented workforce can both apply existing and introduce new digital applications and techniques to business operations and drive revenue and margin in firms.

The skills priorities within the strategy include:

- Developing a high-quality skills and training offer that is focused on the needs of the employer and wider economy (see curriculum for growth).
- Promoting digital as a career option for young people (see Careers Strategy).
- Encouraging lifelong learning including the uptake of basic digital skills for those unable to use technology.
- Improving the adaptability of the workforce to future changes – by developing digital capability
- Supporting the capacity of schools to nurture and develop children's digital capabilities - through formal education by embracing technology and encouraging its use in the classroom. Deliver targeted school-business engagement activities focused on the STEM requirements of future employers.
- Enabling education professionals to be digitally enabled - ensure schools are plugged into the leading digital networks and have resources to access appropriate digital equipment and software to enable pupils to learn with the latest digital applications.
- Continuing to align the further and higher education curriculum with business needs – further and higher education institutions to deliver curriculum and content that is relevant to employers needs and emerging trends in the digital sector.

The Careers Strategy for Cumbria was launched in 2019 and is delivering an effective support programme for schools, Colleges and providers to achieve the Gatsby Benchmarks and develop Careers Leaders, communicating labour market information and opportunities to young people and developing a wide range of employer encounters and experience of the workplace. This has seen growth in the Enterprise Advisor Network and Cornerstone employer network, a group of committed employers working with schools and Colleges through the Careers Hub to support young people in understanding the labour market, the world of work and experiencing high quality opportunities with employers across the Cumbrian economy.

The Impact of Covid-19

The Covid-19 pandemic has required the SAP to consider the skills priorities set out above. The table below sets out how the priorities reflect the current economic environment. The timescales within the table reflect the projected economic recovery period from the pandemic:

Strategic Imperative	Impact			Priority Activity
	Short Term (Sept 2020 to June 2021)	Medium Term (July 2021 to August 2022)	Longer Term (Sept 2022 onwards)	
1. Declining Working Age Population	LOW Reduced employment opportunities will mask the shortage of labour.	MEDIUM Jobs recovery projected to be slower and slowly returning to normal levels avoiding obvious labour shortages.	HIGH Jobs return to pre COVID-19 levels exposing the growing workforce gap.	Ensure Jobs Fuse is linking the workforce to job opportunities. Reboot the Your Future Campaign to promote Cumbria as a place to live, work and invest.
2. Thin pool of higher level skills	MEDIUM Demand will be reduced as job opportunities decline. However, this is offset by redundancies some of which will affect those with higher skill levels.	MEDIUM Employment demand will not have fully returned, which will mask the availability of higher level skills.	HIGH Return to pre-COVID-19 levels of employment, increased new business opportunities and potential exit from the labour market of those with higher level skills will expose gap.	Encourage businesses to preserve higher level skills in restructuring activity. Develop Cumbria's HE offer through Citadels and Barrow Campuses. Strengthen linkages with HE institutions outside of Cumbria to promote Cumbria as a live and work destination.
3. Cold spots of worklessness and deprivation	HIGH Forecasting significant increases in unemployment making those further from the labour market less likely to be employed.	HIGH Employment opportunities in short supply. Business base in safeguarding rather than growth mode.	HIGH Increasingly competitive labour market makes it more difficult for long term unemployed to return to work.	Ensure new DWP programmes provides the necessary support to link opportunity and need. Work with CLES to develop and implement reboot Cumbria's commitment to inclusive growth. Work with the VCSE to support people living in deprivation to support skills development and mental wellbeing.

Strategic Imperative	Impact			Priority Activity
	Short Term (Sept 2020 to June 2021)	Medium Term (July 2021 to August 2022)	Longer Term (Sept 2022 onwards)	
4. Increase Business Start Ups	HIGH Start-ups unlikely in uncertain and difficult trading environment	MEDIUM More stable trading environment and availability of redundant workers stimulate start-ups.	MEDIUM Trading environment still not strong enough to see significant start up activity.	Target would-be entrepreneurs through the Your Future and Our Future campaigns. Ensure business start-up is an option for redundant workers
5. Increase Faster Growing Firms	HIGH Business focussed on stabilisation and preservation.	HIGH Businesses focussed on returning to pre-COVID performance.	MEDIUM Trading environment more settled and potential for growth returns.	Implement Peer-to-Peer Network programme. Implement Covid-19 Supplementary BEIS programme.
6. Increase Innovation Activity	MEDIUM COVID-19 has forced innovations as businesses have needed to adapt to survive.	MEDIUM Innovations implemented in COVID-19 period are refined and developed.	LOW The combination of COVID-19 and Brexit will have fostered innovations.	Develop and implement the Cumbria Innovation Programme, providing a route map through innovation products and services. Roll out the learning from the MIT REAP programme.
7. Improved Infrastructure	MEDIUM Infrastructure performed well during lockdown and delivered acceleration of digital working.	LOW Demand settles in a way that balances supply and demand.	LOW Greater harmony on infrastructure supply and demand, which facilitates further economic growth.	Promote and identify investment for Cumbria's Infrastructure priorities. Finalise and implement Digitalisation Strategy.

The strategies set out above align with other national strategies that reflect the importance of skills as a driver of productivity, innovation, and growth.

The Plan for Jobs announced a range of support for employers to build the skilled workforce they need as we emerge from the pandemic and offered skills support and guidance to those seeking to return to employment. The incentives within the plan reflect the strategies we have set out above, focusing on technical training (Apprenticeships and T Levels), routes into employment and skills opportunities (Traineeships, Kickstart and Sector Work Academies) and guidance through an enhanced National Careers Service.

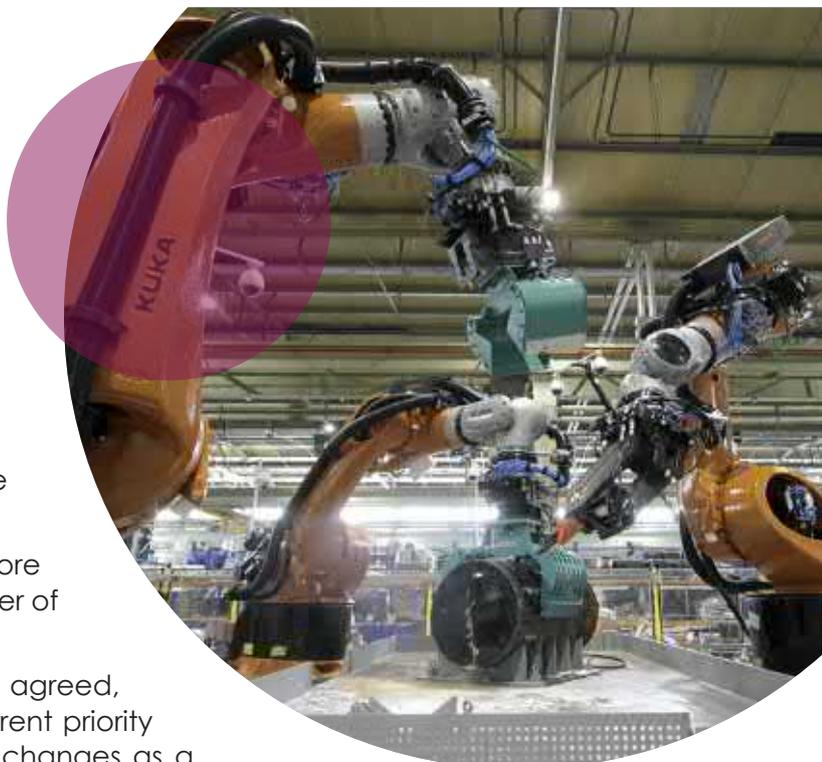
The Green Jobs Taskforce launched in November 2020 looks to ensure we have the immediate skills needed for building back greener, such as in offshore wind and home retrofitting. It aims to develop long-term plan that charts out the skills needed to help deliver a net zero economy and will support workers in high carbon transitioning sectors, like oil and gas, to retrain in new green technologies.

Cumbria's ambition is to become a net positive contributor to the UK on clean energy, decarbonising heat, power and transport through offshore wind, nuclear and hydrogen, driving clean growth to support the achievement of net zero by 2050. The SAP will work with the LEP's Clean Energy panel and other local partnerships to identify the skills and support required for this transition and support the skills system to continue to develop and provide a skills offer that enables employers to build the workforce of the future.

The Further Education White Paper, published in January 2021, sets employers at the heart of the skills system. The proposals within the paper include giving employers a role in designing skills programmes to ensure that the education and training people receive is directly linked to the skills needed for real jobs. It also aims to boosting the quality and uptake of Higher Technical Qualifications that provide the skills that our employers need and will provide support to enable people to train and retrain through modular and flexible learning. The aspiration of the SAP is to secure this for skills provision at all levels, including in partnership with our higher education partners.



Chapter 5 – Skills Action Plan



This action plan sets out the actions agreed by the Skills Advisory Panel to address the priorities set out in Chapter 3 and the strategy set out in Chapter 4.

Each of these actions aligns with one or more of the priorities and is being led by a member of the Skills Advisory Panel.

This section outlines each of the actions agreed, which of the priorities it aligns with, the current priority status, links to national initiatives and any changes as a result of the Covid-19 pandemic.

Place-Based Promotional Campaign



The SAP will work with partners across the LEP to deliver a place-based promotional campaign to reflect the opportunities available for rewarding careers in Cumbria, recognising the contribution young people make to the Cumbrian economy and their communities, the success of students in Cumbria, the skills and careers that can be secured in Cumbria.

The campaign will focus on young people and those in the workforce looking to locate to Cumbria and will be supported by the Cumbria Careers Hub and other agencies promoting opportunities in Cumbria.

As a result of the pandemic, in the short term this is low priority but by September 2022 will return to a high priority action.

Whilst the campaign is low priority, a high priority element to this for young people has been Cumbria Careers Hub providing a wide range of support and guidance for young people about the opportunities for young people to build rewarding careers in Cumbria. This has included the delivery of virtual work experience and links with employers, the provision of labour market intelligence and short videos for young people outlining current changes in the labour market. The aim of support is to ensure that young people understand the Cumbrian economy, the range of rewarding careers available across all sectors, the diverse nature of these opportunities and the routes through which they can access them.

For adults, this high priority support has been provided through the delivery of the Jobs Fuse initiative, a programme of co-ordinated careers guidance and skills support linking National Careers Service support with skills support for unemployed programmes.

This action aligns with the following priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

The development of a longitudinal relationship with young people



The SAP has identified the development of a longitudinal relationship with young people as a key driver in making the best use of available talent and creating our future workforce.

The aim of this project is to maintain a relationship with young people who leave Cumbria, to promote opportunities in Cumbria that would enable them to build a rewarding career in the County.

The key aspects of the project are:

- Map the existing offer and identify gaps – Cumbria has a range of excellent initiatives supported by a range of organisations which maintain contact with young people at different points in their career journey. These include Cumbria Future Leaders, Cumbria Futures Forum, school alumni, university alumni associations, Hello Future, service leavers groups etc.
- Identify the range of information and messages that could be communicated to young people and routes through which this could be done
- Develop mechanisms to co-ordinate the production and dissemination of information
- Work with Cumbria Careers Hub to develop effective tracking of students for up to three years in line with Gatsby Benchmark expectations

In the short term this is low priority but by September 2022 will return to a high priority action

This project aligns with the following priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Build a curriculum for inclusive growth



The SAP is committed to working with partners to build a curriculum that supports employers and learners to grow, to provide pathways into rewarding careers and employment opportunities, to provide opportunities for upskilling and re-skilling and to demonstrate the impact skills development can have on growth, productivity and progression. This will build on established partnerships between employers, schools, further and higher education providers and the voluntary and community sector. It will also build on national and regional skills interventions such as Careers Hubs, National Careers Service, Apprenticeships, Traineeships, T Levels, and the development of Institutes of Technology

The key elements of this curriculum will include:

- An effective approach to transition at key points
- A clear understanding of employer skills needs
- A technical education vision
- Building an enterprising culture
- A clear understanding of the current and future skills offers
- Demonstrate career pathways across growth sectors
- An approach to digital skills
- Meeting the needs of older workers
- Securing a consistent approach to employability skills
- An employer-led Higher skills offer.

In the short term this is a medium priority returning to high priority by September 2022

During the Covid-19 pandemic the SAP has worked to simplify and clarify the careers education, skills and employment support for young people, employers, and individuals. This has included the development of:

- Cumbria Activate Your Future – a programme of support for young people making the transition from school to further education
- Jobs Fuse – an extension of the National Careers Service to include skills support and guidance for individuals facing unemployment and employers making changes to their workforce
- The Edge – Skills Support for Workforce support employers making changes to their workforce, enabling people to upskill and reskills
- The Key and Journey to work – Skills support for unemployed residents focused on progressing towards, and into employment.
- Cumbria Opportunities – an online tool bringing together careers education, job opportunities and skills opportunities
- Careers Hub support for schools and Colleges – a range of support for young people and careers leaders including virtual work experience and Hello Future
- Youth Hubs – led by DWP and local authorities, a range of local agencies, including colleges, the third sector and the Careers Hub, have established virtual hubs which will offer face to face support for young people as guidance permits. Located in alternative venues to Job Centre Plus, Youth Hubs will be coordinated by Youth Employment Coaches. Hubs in Barrow and Carlisle have been launched to date.

The SAP will work with employers to understand their skills needs and priorities and work in partnership with the skills system to identify opportunities for development, innovation growth of the offer to respond to these needs, reviewing progress. This action will be an on-going piece of work as skills needs and employment patterns across the economy are changing rapidly.

The SAP will also support partners in the development of innovative skills initiatives such as the Borderlands Inclusive Growth Deal which will drive investment and innovation in rural skills and support the development of the Citadels project, a new city centre campus for the University of Cumbria which will expand opportunities for local students and attract new students to the area. The Borderlands Partnership aims to narrow the productivity gap, increase the working age population and deliver inclusive growth across the region.

This action aligns with the following skills priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Deliver a Careers Strategy for Cumbria



The SAP is committed to the delivery of the Careers Strategy for Cumbria. The actions associated with this plan include:

- An approach to careers education for all ages – the promotion of careers opportunities is critical to addressing some of the challenges set out earlier in this report. Improving the understanding of the scope of the Cumbrian economy, the employers that flourish within this unique economy and the opportunities available, will help with retaining young people and encouraging older workers to remain in work. Cumbria Careers Hub will work with schools and colleges to enhance career education for young people, ensuring young people learn from labour market information and link curriculum learning to careers. For adult careers education the National Careers Service provides a range of information to inform careers choices. This support has been enhanced during the Covid-19 pandemic to link this to skills support programmes and provide a service to those facing redundancy or unemployment
- A campaign promoting opportunities – this action will ensure that the work of the Careers Hub and the National Careers Service is linked to place-based initiatives such as the LEP's Your Future/Our Future campaign promoting opportunities for young people to build rewarding careers in the county
- Effective co-ordination of experiences – young people across Cumbria benefit from a wide range of encounters with employers and experiences of the workplace, with many employers working with Careers Leaders in our schools and Colleges to provide work experience, world of work days, mock interviews and a range of other experiences. The county also has a range of innovative projects that link employers with curriculum learning such the Local Labour Market Aligned Curriculum at Beacon Hill School in Aspatria. The challenge is to co-ordinate these projects and opportunities to secure support for all young people across the County including young people within special schools and pupil referral units.

During the Covid-19 pandemic the SAP has worked to implement a range of support including:

- Cumbria Activate Your Future – a programme of support for young people making the transition from school to further education
- Jobs Fuse – an extension of the National Careers Service to include skills support and guidance for individuals facing unemployment and employers making changes to their workforce
- Careers Hub support for schools and Colleges – a range of support for young people and careers leaders including virtual work experience

This action remains a high priority for all age groups and aligns to the following priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Develop a shared understanding of employer demand for higher level skills



The SAP has brought together a range of information and intelligence on current and emerging skills needs from LEP Sector Panels and other networks. This intelligence and information supplement the analysis contained in Annex A and B in this report which identifies the need for higher level skills across the breadth of the Cumbrian economy.

To clarify the specific higher-level skills needs of employers the SAP will work with each sector panel to identify the occupations where these skills will be required. At the same time the SAP is working with higher level skills providers across the area to identify the precise higher-level skills offer. A mapping exercise will then be undertaken to identify gaps in the offer and plans developed to enhance the offer where required.

In addition to sectoral and occupational level mapping, the SAP will also review the offer to ensure employer needs for higher level leadership, management, digital and enterprise skills are also met. This will have impact across all sectors of the economy.

The SAP will ensure that this activity is aligned with the implementation of T Levels across the County, supports the continued expansion of higher and degree level Apprenticeships and is also used to inform the development of a proposal for an Institute of Technology supporting the Healthcare and Manufacturing sectors.

This remains a high priority and aligns with the following skills priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Develop a technical education vision for Cumbria



The SAP has identified the development of a Technical Education Vision as a key component in further developing the high quality, responsive curriculum that meets the needs of employers and communities.

This is particularly critical given the significant shifts in technical education policy and Cumbria's strength in technical education, with many employers working with the skills system to deliver high quality technical education.

The changes to technical education include changes to Apprenticeship programmes, the growth of higher level and degree level Apprenticeships, the decline in intermediate and advanced Apprenticeships and the introduction of T Levels.

The aim of the Technical Education Vision will be to bring together a range of information, guidance, and support to enable employers and potential learners to become informed consumers of technical education.

It will cut through the often, complex nature of technical education and present the high quality, responsive technical skills offer in the county in a way that enables employers and learners to easily access the skills support they need. This is particularly important when employer's skills needs are driven by significant, fast moving technological and economic change.

The vision will have the following objectives:

- Identify and promote provider specialisms
- Streamline access for employers
- Share good practice in flexible delivery of skills support
- Drive collaboration between employers and providers and facilitate the translation of business skills needs into effective responses
- Provide high quality information for learners, employers, and influencers
- Support the development of high-quality pathways within the curriculum for inclusive growth, co-designed with employers
- Promote the high quality, responsive skills system across the County.

As part of the work programme of the SAP the Technical Education Vision will also support:

- The aims and ambitions set out in the Careers Strategy for Cumbria
- The aims and ambitions of the escalator model of support for unemployed residents

This remains a high priority action and aligns with the following skills priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Develop an escalator model of support for unemployed residents



The SAP has supported the development of a wide range of skills support and careers guidance to assist unemployed residents in gaining employment.

The programmes of support have enabled many people secure employment, however the range of support can often seem confusing to both learners and employers, and provision is often provided for a broad client group leading to duplication.

This action aims to secure collaboration to ensure that individuals and employers who require support can source guidance identifying the right programme for their needs and the guidance includes the identification of next steps in the journey towards employment. This is particularly important with the recent introduction of a variety of new national initiatives which add to the offer already in place and developed at a local level, and with significant changes unemployment rates and cohorts across the County.

The key aspects of the project are:

- Map the existing offer and identify gaps – the range of provision offered is significant but may lead to duplication and gaps in provision for some sectors, in some geographies and for some individual needs.
- Develop an escalator model of support – each individual seeking support will require a skills solution that reflects their ambitions and their distance from the labour market. The provision should be structured and communicated in a way that reflects this.
- Maximising flexibilities in funding to support the solutions identified above
- Communicating opportunities to older workers – utilising routes such as National Careers Service to communicate the range of opportunities available in Cumbria
- Ensuring employers are provided with a range of material that sets out the support available.
- Work with the Voluntary and Community Sector to reflect the work carried out in this critical area of skills support

During the Covid-19 pandemic the SAP has worked to implement a range of support including:

- Cumbria Activate Your Future – a programme of support for young people making the transition from school to further education
- Jobs Fuse – an extension of the National Careers Service to include skills support and guidance for individuals facing unemployment and employers making changes to their workforce
- Enhancements to the Key and Journey to Work programmes to support skills support for unemployed residents
- Supported the implementation of the Kickstart initiative
- Developed Cumbria Opportunities – an online tool bringing together careers education, job opportunities and skills opportunities
- Developing a programme of support for young people NEET to secure progression into education and employment opportunities

This remains a high priority and aligns with the following priorities:

SKILLS PRIORITY					
	Nurturing Talent	Grow & retain higher-level skills	Create the future workforce	Develop our future leaders & managers	Address worklessness
PRIORITIES ADDRESSED					

Chapter 6 – Assessment of Progress



Cumbria's Skills Advisory Panel (part of Cumbria LEP's People, Employment and Skills Strategy Group) is the only strategic group in the county focusing on working with employers to develop a shared understanding of skills priorities across Cumbria's unique economy and influencing the development and delivery of the skills offer to meet these needs. The People, Employment and Skills Strategy Group is the thematic arm of the Cumbria LEP Board for all employment, education, skills and careers related issues and provide advice and recommendations to the LEP Board on future investment in line with the current and future needs of the Cumbrian economy.

The SAP has worked together with partners across the LEP Governance structure of identify the strategic imperatives for skills and brought together leaders from across the skills system to develop responses to these priorities. This has facilitated the development of skills responses focused on challenges arising from the Covid-19 pandemic. The SAP has also worked with the Cumbria Business and Economic Response and Recovery Group to develop and promote skills initiatives and incentives and address employer needs.

It is the group that provides leadership through both membership and influence with links to a wide range of other networks and partnerships. This ecosystem is set out below:



Drawing on the skills, knowledge, and expertise from across this partnership the group has made considerable progress in driving forward agreed skills priorities detailed previously.

A summary of progress is set out in the following table:

Intervention	Progress
<p>Deliver a place based promotional campaign to reflect the opportunities available for rewarding careers in Cumbria, recognising the contribution young people make to the Cumbrian economy and their communities, the success of students in Cumbria, the skills and careers that can be secured in Cumbria.</p>	<p>The campaign commenced prior to the Covid-19 pandemic. Examples of the campaign material can be found here: https://www.thecumbrialep.co.uk/young-people-careers-in-cumbria/</p> <p>The Cumbria Careers Hub has also developed a range of support and guidance for young people to ensure they understand the opportunities across the Cumbrian economy. The impact of this can be demonstrated through performance data from the Careers and Enterprise Company (CEC) that indicates young people in receive high levels of encounters with employers and experience of the workplace</p>
<p>The development of a longitudinal relationship with young people to inform them of opportunities in Cumbria at every point in their learning journey as well as an approach to the communication of opportunities for older workers.</p>	<p>The structures through which the initial iteration of this could be delivered have been identified. This remains a work in progress and has been delayed due to the pandemic.</p> <p>An example of progress made includes the development of the Cumbria Future Leaders led steering group which draws together different youth boards and networks. The group is a mechanism by which the various Youth boards and youth groups and young people networks can come together to collaborate. The group have developed a website where all pre-existing opportunities placements work experience employer opportunities are gathered in one plug in place for young people 16 to 25 can access there's also a series of networking and development events.</p>

Intervention	Progress
<p>Build a curriculum for inclusive growth that builds on strengths across the skills system.</p> <p>This should include:</p> <ul style="list-style-type: none"> a) An effective approach to transition at key points b) A clear understanding of employer skills needs c) A technical education vision d) Building an enterprising culture e) A clear understanding of the current and future skills offers f) Demonstrate career pathways across growth sectors g) An approach to digital skills h) Meeting the needs of older workers i) Securing a consistent approach to employability skills j) An employer led Higher skills offer. 	<p>The progress made to date includes:</p> <ul style="list-style-type: none"> • The development of a transition focused portal containing a wide range of support for young people at the end of Key Stage 4 and Key Stage 5 • On-going discussions with employers and representative groups to understand skills needs and identify ways in which they can be supported has informed the development of the Skills Support for the Workforce programme, Edge in Cumbria. • Developing a programme of enterprise skills support for schools and Colleges through the Cumbria Careers Hub in partnership with University of Cumbria and the development of a programme of support for business start up • The evidence base provides an overview of the skills offer and this has been translated into a useable tool for learners and employers within the Cumbria Opportunities website and will inform the on-going development of the Cumbria Careers Hub website and Cumbria LEP website skills pages • Cumbria Careers Hub continues to bring together a range of information and support for schools and Colleges to demonstrate career pathways and the Jobs Fuse programme and Cumbria opportunities website provide career pathway support for adults and employers • The development of a digitally capable section of a Digital Strategy for Cumbria • The development of a Centre for Digital Transformation by University of Cumbria • The development of a co-ordinated programme of support for unemployed residents focusing on employability skills and sector focused pathways. • The employer led higher led skills offer continues to develop with the increase in degree and higher-level Apprenticeships, the development of a proposal for an Institute of Technology, the development of higher-level skills offers within Town Deal proposals
<p>Deliver a Careers Strategy for Cumbria including:</p> <ul style="list-style-type: none"> a) Effective co-ordination of experiences b) A stable Careers Education workforce c) A campaign promoting opportunities d) An approach to Careers Education for all ages. 	<p>The progress made with the delivery of the Careers Strategy for Cumbria includes:</p> <ul style="list-style-type: none"> • The place-based campaign detailing careers available in Cumbria • The Careers Hub providing support, guidance and information to schools and Colleges to develop their careers education practice • The development of high-quality work experience and employer encounters for young people, including virtual work experience • Progress has been made against each of the benchmarks for high quality careers education (Gatsby Benchmarks) with Cumbria amongst the best performing Careers Hubs for encounters with employers and experiences of the workplace. Significant progress has also been made against benchmarks for the stability of careers education programmes, learning from labour market intelligence, linking curriculum learning to careers, encounters with further and higher education and personal guidance.

Intervention	Progress
<p>Develop a shared understanding of employer demand for higher level skills including:</p> <ul style="list-style-type: none"> a) Understanding future employment trends and needs b) Developing flexible delivery methods c) Building an enterprise culture. 	<p>The employer led higher led skills offer continues to develop with the increase in degree and higher-level Apprenticeships, the development of a proposal for an Institute of Technology, the development of higher-level skills offers within Town Deal proposals</p> <p>The SAP is working with partners to develop a shared understanding of the breadth of the higher skill offer across the County. Further details are in Annex A and B to this paper</p>
<p>Develop a sustainable offer of Higher-Level Skills:</p> <ul style="list-style-type: none"> a) Understanding what Cumbria can offer b) Develop a shared approach to employability skills c) Develop theoretical pathways into high level skills opportunities. 	<p>See above</p>
<p>Develop a technical education vision for Cumbria that will:</p>	<p>A draft technical education vision has been drafted to support employers and learners identify the available routes and simplify the system</p>
<p>Develop a technical education vision for Cumbria that will:</p> <ul style="list-style-type: none"> a) Develop High Quality routeways b) Improve work readiness c) Anticipate skills demand changes d) Provide information for learners and influencers e) Provide engagement with employers at all stages of learning f) recognise skills and knowledge obtained outside the classroom g) Secure on-going collaboration between employers and the skills system h) Enable employers to become expert customers of the skills system i) Define delivery methods that will encourage employer participation. 	<p>A draft technical education vision has been drafted to support employers and learners identify the available routes and simplify the system</p>
<p>Develop subject and sector specific academies that would bring together the skills offer in common themes such as leadership and management, project management.</p>	<p>LEP sector panels have identified the development of sector focused academies as a solution to the delivery of skills needs. The basis for this concept needs to be further developed and the SAP will move this work forward as the economy recovers and the proposals for the following facilities are developed:</p> <ul style="list-style-type: none"> Institutes of Technology Town Deal skills projects Civil Construction skills facility Electric vehicle skills facility
<p>Develop an approach to engage young people in the design and delivery of responses to the People, Employment and Skills challenges.</p>	<p>The SAP has engaged the LEP Futures Forum and Cumbria Future Leaders in the development of proposals and the development of this report.</p>

Intervention	Progress
<p>Develop an escalator model of support for unemployed residents.</p> <p>Ensure that flexibilities in skills funding are fully influenced by the LEP, understood by employers, and utilised by providers to meet identified needs.</p>	<p>The range of support available for unemployed residents is significant, including:</p> <ul style="list-style-type: none"> Kickstart The Key ESF project Journey to Work JETS CAEHRS Job Finding Service <p>The SAP has identified that as programme continue to be developed at a national level the need for localised co-ordination aimed at localised priorities is becoming ever more important as the cohort changes and the skills needed to secure employment opportunities change.</p>

The influence of the SAP is demonstrated in the progress made against each of the priorities set out above and the associated work programme for the group.

There are, however, areas where the SAP has concerns about the ability to influence the development and implementation of provision.

These include:

- Local input to the development and implementation of national programmes such as Kickstart, Restart and Traineeships
- The speed at which provision is commissioned following LEP identification of priorities
- The commissioning of provision with large, diverse geographies

However, where influence has been possible the SAP has been able to support the development of a range of initiatives, including:

- Careers Hub – Cumbria was successful in an application for a wave 1 Careers Hub to develop a community of practice for schools and Colleges to enhance their Careers Education strategies. The Hub brings together a partnership of employers, schools, Colleges, Higher Education Institutions, and other agencies to ensure young people understand the range of rewarding careers available across the Cumbrian economy
- Institute of Technology – Cumbria has developed a proposal for an Institute of technology focusing on higher level digital skills for the Healthcare and Manufacturing sectors
- Skills Support for the Workforce – the Edge in Cumbria is an ESF funded project currently in its third iteration that has been critical to the development of the workforce in Cumbria, focusing on identified skills needs within the skills evidence base and sector skills plans. The current programme initially focused on the challenge of higher-level skills and has now shifted focus to address challenges arising from the Covid-19 pandemic
- Cumbria Opportunities – an online portal for young people, adults and employers bringing together careers guidance, job opportunities and skills opportunities

- The Link – a programme of employer engagement to link schools with the world of work and facilitate access to employer links for schools and Colleges. This project supports the Career Strategy for Cumbria and will help to enhance the range of workplace experience available to young people as well as linking careers to the curriculum
- The Key and Journey to Work – skills support for unemployed residents that enables participants to gain employment or the skills required to move towards the labour market.
- Jobs Fuse – an extension to the National Careers Service to enable adults to secure high quality careers guidance
- T Levels – building on Cumbria's high-quality technical education offer T Levels will offer higher level technical skills at a time when employers are setting out the need for the skills. With our skills system offering a range of T Levels this will enhance our higher-level skills offer.

The SAP has continued to enhance its knowledge and understanding of the local labour market, current and future skills needs and will continue dialogue with LEP sector panels, LEP strategy groups, Cumbria Business and Economic Response and Recovery Group and other key partners to continue this understanding and develop skills solutions that respond to identified needs. In addition, the SAP has purchased a range of labour market, employment and skills analysis tools to inform the development of programmes, plans and strategies.

Chapter 7 – Case Studies



As outlined in the previous sections of this report Cumbria has many examples of employers and the skills system working together to develop the workforce, provide skills and employment opportunities and support young people in identifying and securing the skills they need to develop rewarding careers.

The examples contained in this section highlight effective collaboration and impact and demonstrate the range of skills support available to employers and individuals across Cumbria.

The case studies set out in this report are:

Skills Priority						
No	Case Study	 Nurturing Talent	 Grow & retain higher-level skills	 Create the future workforce	 Develop our future leaders & managers	 Address worklessness
1	Hello Future – a University of Cumbria led partnership supporting young people from underrepresented groups into higher education					
2	Bright Stars – a project led by Centre for Leadership Performance providing careers support to primary schools					

Skills Priority

No	Case Study	 Nurturing Talent	 Grow & retain higher-level skills	 Create the future workforce	 Develop our future leaders & managers	 Address worklessness
3	Local Labour Market Aligned Curriculum – an innovative approach to embedding careers education in the school curriculum					
4	Careers at Lunesdale Learning Trust					
5	Youth Futures – Oaklea Trust					
6	University of Cumbria and Sellafield Project Academy					
7	Lakes College civil engineering skills centre					
8	SP Training Teaching Assistant Apprenticeships					
9	Penrith Building Society – a Carlisle College led skills support for the workforce project					
10	Lakes College support for Westhouse					
11	Copeland Digital Skills Programme					
12	Copeland Self Employment Programme					



Case Study 1

Hello Future Case Study

Hello Future is part of the Uni Connect Programme, a national programme funded by the Office for Students. Uni Connect aims to support the government's social mobility goals by rapidly increasing the number of young people who go into higher education, particularly those from underrepresented groups.

Hello Future is the Cumbrian partnership, led by the University of Cumbria together with a number of partners including universities, FE colleges, employers and skills providers. Since January 2017, the partnership has focused on working with local areas within Cumbria where higher education participation is lower than might be expected given the GCSE results of the young people who live there. The Cumbrian wards are clustered around West Cumbria, Carlisle and Eden and Barrow in Furness and the partnership offers support to the schools and colleges within these areas.

As an overview, since January 2017 the partnership has:

- Worked with 12,000 young people in Cumbria
- 7,000 of whom are on a sustained and progressive programme of outreach, receiving more than 5 activities
- 4,500 live in our targeted areas
- Engaged 52 schools, colleges, and organisations
- Delivered over 1,300 activities
- Delivered over 20,000 hours of outreach activity

Hello Future is committed to working closely with Cumbria LEP and the Careers Hub to support local skills needs. With the many challenges young people are facing due to the pandemic, there has never been such an important time to support and equip them to realise their talent and ambition. The programme has aligned to support the Cumbria Careers Strategy by working closely with schools and colleges on Impact Measure 7 (Encounters with Further and Higher Education) to offer meaningful intervention activities that are linked to skills required for the workplace and the sector skills gaps.

Cultural Trips and community experiences have been created to provide a package of visits and activities for learners to explore different careers, sector pathways, training, and higher education environments. Following the sustained model of outreach, the packages were created to offer three trips which link to a regionally significant sector; informed by the Cumbria Careers Strategy and works in support of the Cumbria Local Enterprise Partnership and the Cumbria Careers Hub. Learners engage with local employers to expand their knowledge of the sector and careers available, network with industry professionals and hear their educational and training journeys. The With a focus on specific sectors and career opportunities, the trips provide subject insight for learners to experience the subject at higher education level, meeting student ambassadors and course representatives to hear first-hand accounts of student life.

In February 2020 a 'Digital and Media' employer engagement package was launched, facilitating learner trips to theidol.com, based in Penrith and LA12 in Ulverston for Cumbrian students in year 10 and 12 with an interest or passion for the subject.

The intervention aimed to:

- To support the work of the Cumbria Careers Hub, supporting learners in pursuing careers in showcased industries.
- To increase the likelihood of individual target learner progression to HE or a degree apprenticeship.
- To match the high aspirations set by learners based on learner feedback forms we have collected.
- To showcase how university can be suited to learners who may not aspire to higher education.
- Provide learners with low financial support the opportunity to visit institutions that would normally be beyond their financial reach.
- To recruit learners from a low socio-economic background.

Impact:

To evaluate the effectiveness of the outreach programme we used pre and post learner surveys to measure the distance of their aspirations, attitudes, knowledge, and intentions. This was triangulated with ethnographic observation by outreach practitioners on the day. Many of the learners told us that they had not spoken to someone who had been to Higher Education before or someone who was older but had shared interests.

As a result of their participation:

- Learners were more confident asking a question in a group and in giving their opinion to new people.
- Learners were more positive about their ability to learn outside of the classroom.
- Learners felt more able to apply their skills to new tasks.
- Learners felt more confident in their ability to ask for help when they need it.
- Learners enjoyed being able to challenge their skill set.
- Learners felt more confident travelling alone and travelling in a group.
- Learners felt more supported to make decisions about their future and generally felt more positive about their future.
- For learners who were unsure about pursuing university, an apprenticeship, or a career in this sector prior to the activity we saw a positive shift in their intention and those who had already decided remained confident of their decision after participation.



Case Study 2 -

Centre for Leadership Performance (CfLP) – Bright Stars

“Bright stars has really lived up to its name. We have developed a school full of Bright Stars who have gained so much knowledge about the world of work and how to run a company. The competition has given our children so many opportunities, beyond what we anticipated. Thank you CfLP.” Fiona Stoddart, Walton and Lees Hill CE Primary School, Brampton

OBJECTIVE

Bright Stars is an exciting eight-week programme designed to introduce children in primary schools across Cumbria to leadership, entrepreneurship and the world of business whilst raising money for charity, winning funds for their school and having fun along the way.

Bright Stars is project-managed by CfLP and delivered in partnership with local businesses. The programme originated through discussions with Cumbrian business leaders keen to address low levels of business start-ups and the need to inspire and nurture a culture of enterprise and aspiration from a young age.

Now in its 9th year Bright Stars has involved more than 60 businesses and 100 schools, and engaged more than 6000 children, raising over £100,000 for schools, and chosen charities

PROGRAMME

Schools are partnered with local business mentors and have eight weeks to grow a stake of £50 through investment and creativity by setting up their own mini businesses.

The programme is an inclusive programme open to whole year groups. Children who may not be switched onto traditional learning often light up though the excitement of running a business and being leaders in their schools with roles and responsibilities.

Pupils develop their skills while raising money for charity, winning prize funds for their school and, of course, having fun along the way. Bright Stars provides opportunities for local businesses to forge ongoing links with their local community, and gives the business partners a refreshing new perspective on the world of business.

To overcome COVID restrictions, the CfLP in consultation with primary schools and business partners developed a new approach for Bright Stars 2021. It has become a virtual experience and the focus of the challenge has shifted from “making a profit” to “making a difference”.

It focuses on growing concern of communities being ‘left behind’ due to COVID-19, reinforced the need to provide enriching and stimulating experiences for the children. Each school and their business mentors will work together to develop a digital campaign to ‘make a difference’ or bring about change relating to an issue that matters to the children, either local or linked to a national or global topic.

OUTCOMES: BRIGHT STARS

- Helps to raise aspirations, confidence and self-belief as young people showcase hidden talents.
- Enables children to develop new skills in communication, enterprise, and leadership.
- Gives the young entrepreneurs access to positive role models from the world of business - raising aspirations and showcasing local careers and companies.
- Encourages children to 'Dream Big' and feel more confident and braver about their future, empowering them to influence change and 'make a difference'.
- Forges ongoing links between schools and businesses and builds stronger relationships with their communities they serve.

IN THEIR OWN WORDS

"We worked better as a team and have learnt to be grateful for what we've got as we have raised lots of money for our charity" Poppy & Marsie, St Joseph's, Cockermouth

"I loved the experience, every minute of the planning and at the end it was all worth it. Our team was outstanding I wish it had never ended! We all said how happy the people at the Shelter and Centre were to see us and our soup. It put huge smiles on our faces for the rest of the day." Pupils at Newbarns Primary and Nursery school"

"it's not like learning, it's just brilliant!" Pupils at Victoria Academy



Case Study 3 -

Beacon Hill Community School

The Local Labour Market Aligned Curriculum (LLMAC) is one of the many aspects of Beacon Hill school that makes it individual, forward thinking and deeply embedded within the community.

The school recognised that as a country we are in the midst of great change, and these changes have a major impact in Cumbria, which will accelerate in the coming years. In Cumbria, there is a significant shortage of people to take over the jobs of those projected to retire or leave in the coming years. This number is in the tens of thousands, and there are just not enough students coming through from our schools and colleges to fill these often vital roles.

In response to these challenges the school decided, following extensive talks and consultation with local and national employers and professional bodies to introduce the LLMAC curriculum.

The school wants to ensure that their students are prepared, aware and ready to accept the challenges that are coming and grasp the huge opportunities that they offer.

The strands that weave together into LLMAC, together with the traditional curriculum, are Cumbrian Award, Industry Project and a BTEC in Engineering.

The Cumbrian Award was developed with the aim of preparing students with the necessary knowledge, communication and problem-solving skills they will need to address both their own and the local areas needs for the future. Independence is a core attribute, and many of the activities are designed with this in mind. Teamwork and defined team roles are also practised with each team member having a defined and contributory role. Within the Cumbrian Award, students learn more about the opportunities available to them and how to access them, and the geographical features- the science that surrounds us, and historical aspects of Cumbria – often through planning then taking part in expeditions where they explore parts of our region with a guided purpose.

Industry Projects expose students to the job opportunities available to them in Cumbria. A business works with students on a six-week project. Students present their findings to professionals in the field they are exploring for that project. Site visits give a greater awareness and understanding of the industry that surrounds us. There are five core skills, which were identified following extensive discussion with leaders in industry and education, that Beacon Hill seeks to develop in each student - communication, teamwork and leadership, problem solving and analytical thinking, personal management, creativity and innovation.

LLMAC is assessed on a different basis to other subjects, with students expected to work towards the five skills outlined through their project work. There is a progression through each of the skills, and this is split into four descriptors- Introductory, Developing, Applying and Excelling. This allows students who have particular strengths or weaknesses to be self-reflective in assessing their own performance and be aware of their own areas of development or success.



Case study 4:

Exemplary Careers Education at the Lunesdale Learning Trust

CAREERS AT THE LUNESDALE LEARNING

TRUST: <https://vimeo.com/mulhollandmedia/review/524223197/fc39fcd6bb>

At the Lunesdale Learning Trust their ambition is to provide a gold standard of careers advice and guidance tailored to meet individual student needs. The Trust promotes all options from HE to becoming self employed and they place a huge amount of emphasis on employability skills and project based learning.

The Lunesdale Learning Trust is an exemplary example of demonstrating commitment to providing outstanding careers education in school. Their team consists of a Careers Leader, Careers Advisor, Careers Co-ordinator, Employer Engagement Officer supported by an Enterprise Advisor.

Careers Leader Cathy Harrison drives the careers agenda across her two school sites. She has shown real leadership in establishing a strategic framework which gives real stability and focus to the differing agendas across the two schools.

One of the sites is a Studio School, and Cathy with her careers team has shown real leadership in realising the vision for the school, establishing the school and embedding the careers pathways across the school. The Studio School is the jewel in the crown for our approach to careers education development across Cumbria. Queen Elizabeth Studio School is also one of four lead schools for Cumbria Careers Hub and they work hard to share best practice with colleagues across the sector.

The Lunesdale Learning Trust is pro-active when developing their careers programme and willing to look at new initiatives as opportunities to enhance opportunities for their young people including establishing Young LinkedIn Champions and establishing the Employer Advisory Board for the school, another development which is unique within our Hub Area. The Trust know the importance of developing strong stakeholder engagement and has worked tirelessly to establish and develop really strong links within their local area. The development of the Employer Advisory Board has added stability to the careers programme and also ensures that the school is well connected to the local business community. During 2020, the trust took advantage of the use of technology to connect the Studio School with the widest possible employer pool – this has broadened the perspective of the young people and helped to raise aspirations and horizons.

The Careers Team are passionate about raising the future prospects of young people and through their five year careers strategy they are able to adapt their provision to meet the bespoke needs of any individual whilst delivering an innovative and inspiring careers education programme.



Case Study 5

Youth Futures Programme – Oaklea Trust

BACKGROUND

T lives at home with 2 younger sisters, Mum and Dad. He is on roll at a local secondary school but he had not accessed education fully since Year 8. He does not have any special education needs and other than moderate behavioural issues there was no explanation to T disengaging from his education. At the point of referral in October it was noted that 'T's difficulties attending school were historical which have incrementally deteriorated over a period of time, specifically due to lockdown and the return to school'. At this stage in Year 11 he was at risk of NEET and leaving year 11 with no qualifications. T used to play in 2 football teams but had stopped and also withdrawn from seeing friends. Parents are very supportive and made continuous attempts to get T in school. Medical history – T is generally fit and well other than a Gastro problem which previously resulted in admissions to hospital and is currently under the Gastroenterology department at RVI but no actual diagnosis (he takes regular medication). Mental health – T does have episodes of anxiety, mainly relating to the school which worsened when attempting to enter the school building, he also is anxious with new situations. CAHMS were involved but T didn't engage and they recently have withdrawn.

PROGRESS TO DATE

Just prior to R2W being involved, T was not accessing any provision. HHTS had started in the October with Functional Skills Maths & English being taught at home 2 x 2.5 hour sessions per week and this is going well. 16th November was the initial home visit with T and Mum present. T was quiet and lacking confidence but was polite and engaged in conversation (although it was 1 word answers). At this stage it was very clear that T would not manage returning to school for the remainder of Year 11 and school accepted this. The family did not know what options there were for T if he did not go to school and were concerned for his future. Up until now T had some occasional experience of working alongside his Mum doing groundworks tasks and 'was not shy' of outdoor practical work but had not had significant experience to explore his skills and identify areas for skills development. Post 16 education routes were discussed with T including College options and Apprenticeships. A careers advice and guidance session was conducted and action plan completed. T followed through with the action points which included college and apprenticeship research, accessing a virtual college open event and exploring options for work experience. Weekly 1 hour meetings were confirmed for mentoring T on an employability programme from home, building up to the meetings taking place in school. Work experience was set up and risk assessments carried out by R2W with all paperwork of consent and preparation for work experience delivered by R2W.

January 2021 (during lockdown); T continued with his work experience placement and our 1:1 meetings were online. Maths and English continues (online). R2W support adapted to suit online delivery with guidance and support with T to complete a power point presentation about his work experience to be used for the Speaking & Listening element of the English exam.

April 2021; T continues with Eden Bespoke 2 or 3 days each week. In February T was offered an Apprenticeship with his work experience provider. R2W worked with the employer to explore suitable Apprenticeship programmes and set up meetings with both Kendal and Carlisle College for further discussion. Neither could offer a programme that suited the employer ie; a combination of general construction and landscaping. Myerscough was considered by the employer for a Landscape Gardening Apprenticeship but T was not interested due to his passion being more general construction at this stage. R2W supported T with exploring other options.

REFLECTION

T was at risk of becoming NEET. From knowing T for the past 5 months there has been a remarkable change. He now has full engagement in two way conversations, he is happier and his anxiety is improving. The work placement are very, very happy with T commenting on his reliability, hard work and enthusiasm. He goes alone to placement without the support of R2W and other than anxiety at the start he has settled in very well and is really enjoying it. T has improved his skills in confidence, commitment, resilience, independence, communication, time management, team work and problem solving through his work experience. He has also had chance to become more aware about Health & Safety in the workplace and recognises he is a practical learner. Attending a construction related placement has helped further develop his skills, knowledge and experience in this sector which ultimately has confirmed his desire to pursue a career in the construction industry. Engaging with friends again is very promising and his family have commented on the improvement in his moods at home, he now has conversations with them and is 'happy' again. Although T is not getting the opportunity to sit all the exams like other Year 11's he is doing very well with his efforts towards his FS Maths & English. The biggest achievements for T has been entering the school premises (pre lockdown) supported by R2W and his ongoing positive record of attendance with his work experience.

Although an Apprenticeship was T's first choice Post 16 and is still keen to explore this option, he also now recognises the benefits of attending a full time course at college to work alongside others of a similar age and the chosen course will give him experience in 4 disciplines to further his skills and knowledge.

With the continued working relationship between the learner, parents and R2W there are no immediate concerns to the ongoing success of T. R2W are in place to ensure T is successfully accepted into further education after Year 11. T is happy with the progress to date and is motivated to follow through with the next steps.

Expected outcome at the end of Year 11:- To continue in education, either a Level 2 Apprenticeship (if Level 1 Maths & English achieved in the summer) or a full time Level 1 course at Carlisle College then leading into a Level 2 course next year or Apprenticeship.



Case Study 6

Project Academy for Sellafield with University of Cumbria

Originally established in 2016, the Project Academy for Sellafield is a collaborative commercial relationship between the University of Cumbria and Sellafield Ltd. The Project Academy for Sellafield is the first of its kind in the UK, providing specialist education, training, and professional qualifications necessary to deliver the complex and challenging projects on one of Europe's most complex nuclear sites. The Academy delivers project management short courses, professional qualifications, and degree programmes to prepare and educate employees for the changing landscape of project management.

The Project Academy is not a physical place, but an integrated pathway of education, training, development, and professional qualifications. This approach means candidates can begin qualifications at various entry points, determined by their existing experience and qualifications – and to build on this to enhance their skill set. We currently have over 40 offerings available in the form of continuous professional development, professional qualifications, and higher education from Level 4 (HNC) to Level 8 (PhD).

We have worked closely with the Association for Project Management (APM) to ensure our educational offerings are current and reflect the developments being made in wider industry. As the leading professional body for the project management sector, the APM has gone on to accredit a number of our products and we are a provider of APM franchised products. We currently provide a full range of professional qualifications including APM PMQ, APM PFQ, Risk Level 1 & 2 plus many more. We are also delivering a full suite of Continuing Professional Development, including short courses covering a range of project management related professions and disciplines.

The education on offer is available to employees, the supply chain and members of the wider community. This in conjunction with longer term relationships with supply chain companies ensures that our in-house capability is being developed in a sustainable way.

This year we have developed our long-term strategy in response to the Coronavirus pandemic, with our courses being delivered online using specialist software for education purposes. Online courses for the Project Academy are delivered through a virtual classroom to up to 12 participants at a time. The courses are highly interactive; participants will take part in a variety of small group activities and have opportunities to discuss and share experiences throughout the course.

The Project Academy for Sellafield has:

- Engaged with 50 companies and charities who have benefitted from the training and education
- Over 60% of students enrolled on Higher Education courses from organisations external to Sellafield, showing sustainable growth and expansion beyond the nuclear sector.
- Had 4000 Sellafield Ltd attendances on Project Academy courses
- Registered 200 members of Sellafield's project teams on higher education courses
- Delivered over 70,000 hours of education to the Sellafield project teams
- Saved over £1.3m compared to education market rates

The Academy has also received the following:

- Recognised as part of Sellafield's Contribution to the Profession APM Award 2019
- Winner of the Nuclear Decommissioning Authority Supply Chain award 2017 – Best Enhancement of Capacity and Capability
- Excellent Award at the Sellafield Business Awards
- Foundation degree students won the regional APM award in 2017
- The University of Cumbria was invited to speak about the Project Academy at five international conferences
- Selected as a finalist for the National Skills Academy for Nuclear 2021 'Best Employer & Training Provider Partnership Award' (outcome to be announced March 2021).

The vast majority of feedback we have received from candidates enrolled on Project Academy courses is extremely positive. An example of which is shown below:

"I recently attended the Introduction to Commercial, Contracts and Supply course and the whole experience was very positive. Our course tutor was very knowledgeable and paced the course well. I really enjoyed the delivery using the Zoom platform, in fact it was even better than some of the classroom courses I have attended previously. I'm looking forward to taking part in other courses that are being delivered in the same way."

Engineering Manager, Sellafield Ltd



Case Study 7 –

Civil Engineering and Lakes College

Work is set to begin on building a multi-million pound Civil Engineering Training Centre at Lakes College. Celebrations are taking place after the Department for Education awarded £1.4million for the project. This will be added to £900,000 from Cumbria LEP's Growth Deal fund, and £550,000 of college funds.

The centre, earmarked for land opposite the college's main entrance at Lillyhall, Workington, is due to open its doors to the first students next September – the same time the college launches its new T Level courses, which are the equivalent to three A Levels.

College principal Chris Nattress said: "I'm thrilled that we are commencing the construction of our Civil Engineering Training Centre, and have appointed a local contractor in Storys to work with us. "Once open for training next summer, this Centre will provide a fantastic facility here in West Cumbria to support individuals, communities and employers throughout the region train for skilled employment, apprenticeships and careers in construction and civil engineering.

"We know how important a pipeline of talent is for the civil engineering sector, in support of a multitude of build projects and infrastructure across the North. We can't wait to get started now and develop a very impressive asset for Cumbria and beyond."

Work has been going on behind the scenes for six years, planning for the Civils centre. The facility will form a 'world-class', integrated training and skills environment for all aspects of the nuclear and civil engineering supply chain.

It will have an indoor practical area with teaching spaces and outdoor areas for civils training and for heavy machinery and plant operations. It will provide training for a variety of trades, including scaffolders, steel fixers and plant operatives.

Mike Smith OBE, Cumbria LEP Board Member and Chair of the People, Employment and Skills Strategy Group, said:

"Cumbria LEP is proud to support the investment in a high-quality civil construction skills facility at Lakes College. This facility will enhance the skills offer across Cumbria providing our construction sector with a range of support to build their workforce of the future and develop the talent needed to address the challenges of future. Cumbria LEP is committed to supporting our high quality, responsive skills system in meeting the skills needs of our unique economy."

Employers and the civil engineering industry has been fully involved in the design and range of training offered from the outset.

Following the news that planning permission has been secured from Allerdale Borough Council, employers have welcomed the project.

Tracey Emerson-Jewkes, group human resources manager at Thomas Armstrong (Holdings) Ltd, said: "We are delighted to hear Lakes College's wonderful news about the new Multi-Million pound Civils Centre to be built at Lillyhall in Workington.

"As a large local Construction Company employer operating throughout Cumbria and beyond, it will certainly be a valuable and beneficial resource for us and enable us to boost our future employee's skillset."

Paul Fletcher, Cumbria Projects Director for Jacobs, the global technology-forward solutions company, said: "Jacobs has been fortunate enough to recruit many apprentices who trained at Lakes College, so we are looking forward to seeing this new centre take skills to the next level for people joining Cumbria's thriving civil engineering sector."



Case Study 8 – Teaching Assistant Apprentices and SP Training

Apprentices from Carlisle based training provider System People are enjoying great success as results from the Level 3 Teaching Assistant Apprenticeships are announced. A staggering 80% of these Apprentices achieved a distinction grade. The remaining 20% of level 3 learners all gained a pass result.

An Account Manager from CACHE the awarding body confirmed that just under 50% of learners are receiving a distinction nationally. The fact that 80% of their learners received a distinction is fantastic news for the local training provider. This result is particularly welcome since this year sees the first cohort to graduate following the new apprenticeship standards released in 2018.



Louisa Bowman from Carlisle began her Level 3 Teaching Assistant Apprenticeship after she completed the Level 2 with System People in 2019. Louisa achieved a distinction grade and is delighted with her results. Louisa thoroughly enjoyed her Apprenticeship and completed this as an apprentice Teaching Assistant working for Castle Carrock School, a small village school situated on the fringes of Cumbria.

Louisa told us *“I am so happy with my result and have thoroughly enjoyed my apprenticeship. I want to say a massive thank you to my Tutor, Sarah Taylor and all the staff at System People and Castle Carrock School for the support, guidance and learning opportunities throughout my apprenticeship journey.”*

Managing Director of the company Rebecca Bird said that the results are *“fantastic and a real achievement for Louisa, our other Apprentices and teaching staff at System People especially in light of the recent 3 lockdowns.”* She went on to say that *“We are very proud of all of our current Apprentices who are a real credit to our business. They have all showed dedication and commitment to their work and study and deserve the grades they have been awarded, even more so in light of the current lockdown situation.”*

In March this year, as a response to the lockdown, all apprenticeship learning moved to virtual platforms within 1 week of lockdown being announced. Rebecca Bird went on to say *“This prompt reaction and the quick adjustment to the new delivery method has meant that learning continued throughout the pandemic without any classroom sessions being missed with a zero break in learning. Our apprentices have shown real resilience during these trying times and for 80% of them to receive a distinction is testament to that.”*

All of the Apprentices from these courses have progressed into permanent full-time employment which is a positive sign for young people who are considering this route. If you are interested in beginning an Apprenticeship this year and would like to find out more about how System People can help you, please visit their website. www.system-people.co.uk



Case Study 9 –

Penrith Building Society and The Edge Project

Penrith Building Society is a small local business, with 20 members of staff with a relatively small turnover, and so without access to funding, the training and development of staff would be difficult.

Penrith Building Society were able to access European Social Fund (ESF) Skills Support for the Workforce funding via The Edge Project and Carlisle College. The Edge project was commissioned by Cumbria LEP and aims to support SMEs with workforce development needs by raising attainment levels, thus supporting business growth and prosperity.

Following a training needs analysis, Penrith Building Society identified four members of staff to be put through the Leadership and Management programme. All had a number of years of experience within the company and were deemed suitable to complete the Level 4 course.

Penrith Building Society has several key values as a business, one of these values is that they are there to “help its staff to achieve what they aspire to, for themselves and their family during their lifetime.”

Michelle Stevens, Retail Operations and Distribution Executive said

“The Edge funding has assisted Penrith Building Society to help invest in our staff where otherwise it would not have been possible.

“As a company we recognise the importance of training and developing our staff, ensuring they have the adequate support, training and knowledge to conduct their roles to their best ability. We also recognise the importance of staff satisfaction within their roles, and the benefits of staff development and training to get the best out of them, and to make each individual feel valued, whilst also enjoying their working life and building a loyal and happy workforce.”

One of the members of staff on the Level 4 course has since progressed to a Level 5 Leadership & Management Apprenticeship, whilst Penrith Building Society also has a second Apprentice completing an Assistant Accounting Apprenticeship. Both apprentices attend Carlisle College to develop their knowledge and enhance their skills and will achieve professional qualifications.

The training provided by Carlisle College has ensured that Penrith Building Society employees have the knowledge and support to deliver their roles to the best of their ability.



Case Study 10 – West House and Lakes College

Created in 1986 as a partnership between the NHS, Social Services and local charities such as MIND and Impact Housing, West House soon established itself as a care and support provider specialising in helping people feel and be a part of their local community.

West House became an independent Industrial and Provident Society in 1996. Since then the organisation has continued to grow whilst remaining true to its vision of creating better lives for people.

Westhouse are now both one of the largest voluntary organisations and a major employer in Cumbria, with over 400 care and support staff; supporting over 200 adults and over 150 children at home and in the community. West House is a charitable membership organisation, with around 60 shareholding members.

Recognising the need to recruit, upskill and retain staff in a sector that has high staff turnover, Westhouse has demonstrated commitment to training and continual professional development. Lakes College has currently supported them by undertaking organisational training needs analysis. Training packages have been agreed such as 50 care apprenticeships, 11 team leading apprenticeships, 3 leaders in care apprenticeships and NVQ training to upskill current staff. Short courses, care certificates and distance learning are also planned to ensure continuous professional development for staff.



Case Study 11 -

Digital Programme helps fill Vacancies in Care Sector

A new digital programme in Copeland has been rolled out for the first time to move people into work. The programme prepared eight unemployed residents for jobs in the Care Sector. Working alongside Wyndham Manor Care Home in Cleator Moor, Copeland Work & Skills Partners trialed the new programme using a Google Classrooms platform as part of delivering differently and as a result of COVID-19. Five unemployed individuals have been offered employment through taking part.

The Programme covered essential short course training relevant to the care sector such as: Person Centred Approach; Dementia Awareness; Common Signs and Indicators of Stress; Nutrition and Hydration and; Health & Safety in the Workplace. Wyndham provided an insight into the range of job roles in the care sector and what skills and qualities are required to work in the sector. DWP identified and referred candidates to the programme. Inspira assisted clients to get set up digitally and then delivered employability skills over the course of the programme.

The new delivery model allows candidates to prepare for work in the care sector in a safe environment. The care sector was targeted as it is one of the few sectors that has continued to recruit during Coronavirus.

Quote from Deborah Naylor, Area Operations Manager, Inspira: *"Inspira are keen to work creatively in these difficult times to help unemployed clients access training that will lead to work. The response from job seekers and Wyndham Care Homes has been fantastic."*

Vacancies at Wyndham Manor included: Care Coordinators; Support Workers; Domestic Assistants; and Kitchen Assistants. The Partnership plans to trial out the programme with employers in other sectors such as Food and Drink.

Quote from Sue Edwards, Manager at Wyndham Manor Care Home:

"The Programme has helped us identify some good quality candidates who will fill key roles in our business. The candidates have been able to have a clear insight what it is like to work at Wyndham Manor and have had the benefit of care sector related training as part of the process. We have really enjoyed taking part in the Programme".

The Partnership has experience of delivering these programmes working with employers across a wide range of sectors. It's part of the Partnership's remit to help businesses recruit and prepare people for work and they have had to adapt our thinking and be creative in terms of delivery.



Case Study 12 -

Self-Employment Awareness Raising Session for Copeland's Unemployed Residents

Copeland Work & Skills Partnership is encouraging unemployed residents to consider self-employment as a future career option. They now better understand the concept of self-employment through recently attending a newly developed 'awareness raising' session, unique to the Copeland Work & Skills programme.

Supported by Inspira and DWP, the half day, online session, delivered by Dave Porthouse, Director at Money, Education & Support Services, offers attendees the opportunity to find out more about self-employment, including the challenges and requirements of being self-employed and is designed to provide attendees with information about aspects of self-employment to help them decide if self-employment is something they could be interested in. It is seen as a forerunner to 'Entry into Self Employment' – a longer-term programme, currently in place and being delivered by Inspira. The opportunity is open to all unemployed residents across Copeland, including those whose careers may have been affected by COVID-19.

Chris Gibson, Deputy Area Operations Manager at Inspira said: "Through getting involved, attendees will: have an awareness of the different types of self-employment; an awareness of the myths versus the reality of self-employment, along with an understanding of some of the essential skills and characteristics required whilst being self-employed. Support will be available for people who wish to go self-employed including how to access pathway projects such as Inspira's Copeland Entry to Self-Employment programme."

Wayne Dixon, a participant at the session said: "I really enjoyed the course and found out things I didn't know about starting up as being self-employed. The session was very useful in pointing me in the right direction. Dave was a great trainer and the course covered everything I needed to know."

Dave Porthouse of Money, Education & Support Services, said:

"I believe many people at some point in their lives consider self-employment, but are put off by how daunting it can seem. Self-employment is about taking an idea, identifying the barriers and then looking at how to overcome them and unless you actively take those steps to find out more about it you will never know what you don't yet know. Exploring Self Employment gives people the opportunity to find out more about what it means to be self-employed and realise that is not as daunting as it first seemed."

A number of those who attended are now progressing on to Inspira's Entry to Self-Employment Programme, commencing 8th March 2021.

This opportunity is one of a number of ways the Work and Skills Programme – jointly funded by Copeland Community Fund and Sellafield Ltd - is providing support to unemployed residents across Copeland. The Programme also offers workforce development support to employers through its Sector Based Work Academy Programmes and Wage subsidy schemes.

Chapter 8 – Looking Forward

The previous sections of this report outline the challenges facing employment and skills in Cumbria.

The report demonstrates the strengths in skills Cumbria has across its unique economy, and the breadth of employer engagement with our high-quality, responsive skills system where they are at the heart of innovation in skills support and delivery.

The report also demonstrates that the skills priorities identified by the SAP prior to the Covid-19 pandemic are still relevant, albeit with a change in focus and priority level.

It is with this in mind that this section of the report looks forward and draws together the various strengths, challenges and opportunities that exist for skills development across the county.

Firstly, there is a clear need to simplify the skills system to enable employers and individuals as users of the skills system to efficiently access the support they need when they need it. The development of the technical education vision and the on-going development of Cumbria Opportunities, aligned with effective promotion of the skills offer will enable employers, young people, those in work and unemployed residents to become informed consumers of skills support. The SAP will work with employers to understand their challenges and work with the skills system to simplify what can often be a complicated skills offer.

The continued drive to enhance careers education will enable young people to understand the world of work, the Cumbrian economy, and the opportunities for rewarding careers across the county. Cumbria Careers Hub has continued to support schools and Colleges in the development of careers education practice and innovative projects, some receiving national recognition, and the LEP's sector panels are clear that further employment involvement in careers education is critical to developing the workforce of the future. The SAP will continue to engage with employers, schools, and Colleges to secure the high-quality careers support young people across the county require, and that employers have identified as a priority in developing the future workforce.

In discussions with employer partners and the SAP the challenge of flexible skills delivery has emerged. At a time when employers are facing challenges relating to the Covid-19 pandemic the need for increasingly flexible methods of delivery from our skills system is increasing. The innovation developed during the pandemic in supporting skills delivery to employers and individuals can be built upon to continue upskilling and reskilling the economy will require and as set out in Restart, Reboot and Rethink. The SAP will continue to work with our employers to identify the methods of support they need and share these with the skills system to facilitate the on-going innovation in skills delivery. The SAP will also support other innovations in skills for example the Borderlands Inclusive Growth Deal which will drive investment and innovation in rural skills and support the development of the Citadels project, a new city centre campus for the University of Cumbria which will expand opportunities for local students and attract new students to the area.



The higher-level skills offer in Cumbria has continued to grow with the growth in degree level Apprenticeships and the development of the Barrow Learning Quarter as examples of this. As this development continues we will look to our employer partners to continue to identify the specific higher level skills they need to enable their businesses to grow and prosper, which will enable the SAP to support proposals for the on-going enhancement of the offer e.g. Institute of Technology. This will be aligned to the SAP's on-going review of the skills offer and work with sector panels to ensure the skills offer meets needs.

As the effects of the pandemic on employment become clearer the need for a co-ordinated approach to skills support and careers guidance for unemployed residents is critical. There are many programmes of support available, each offering a very similar mix of skills delivery and guidance and targeted broadly at the same cohort. The SAP will work with partners to secure effective targeting and the development of an approach that recognises the distance the individual is from the labour market and the rapid changes in the skills needed to secure employment.

Local Skills Report Annexes

Core Indicators (A) and Additional Data (B)

The core indicators in this Annex and the additional analysis in Annex B act as an insight into the key aspects of Cumbria's labour market. The core indicators and data sources have been selected by DfE to cover aspects of the labour market and skills landscape which are likely to be relevant across all areas.

The format and structure of this Annex have also been determined by DfE as this means that consistent data and analysis is available for all areas which will help those looking across reports from different areas to understand the national picture. Interpretation and narrative has been provided by local analysts and the Cumbria People Employment and Skills Strategy Group (PESSG) which acts as the Skills Advisory Panel (SAP) in Cumbria.

In addition to the fixed, core indicators in this annex, further analysis, including additional data sources selected by local analysts, is contained in Annex B. For clarity, both annexes are structured using the same theme headings as Annex A (Local Landscape; Skills Supply; Skills Demand; and Mapping Skills Supply and Demand) and this structure also reflects the structure used in the skills evidence base produced in 2019 (*Skills evidence base 2019*).

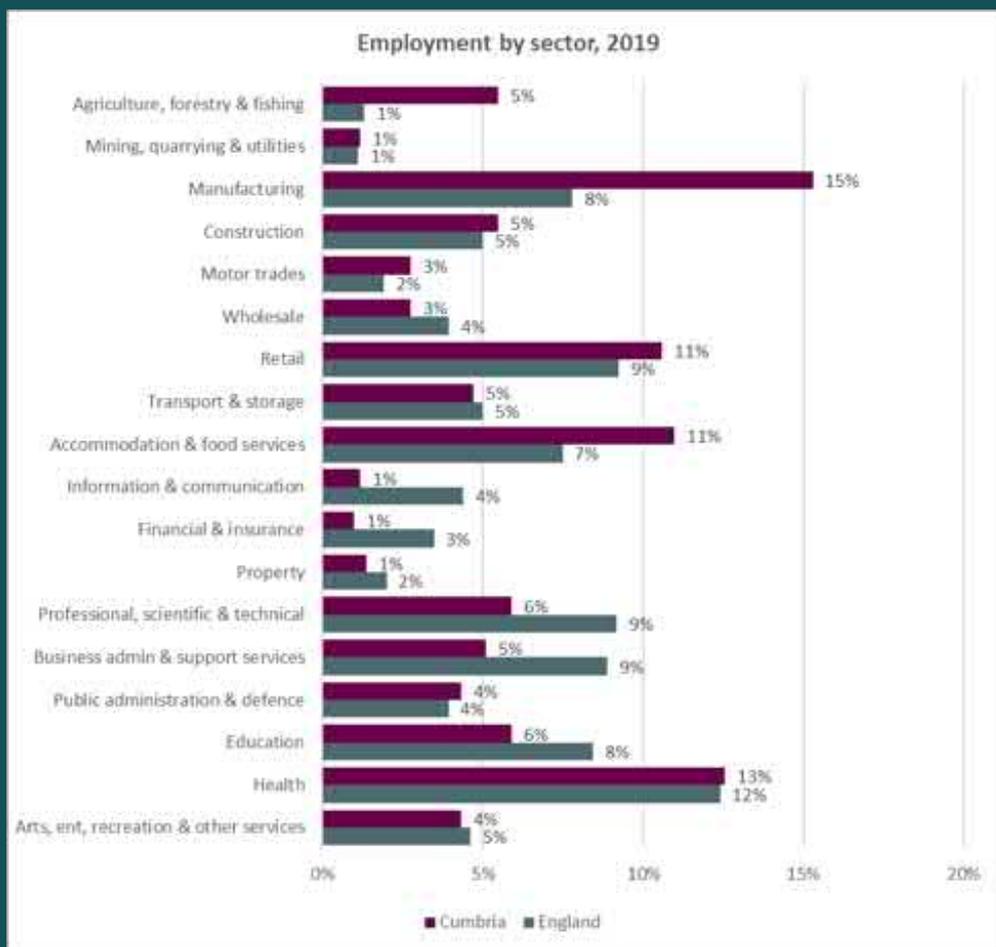


LOCAL LANDSCAPE

Local Landscape - Summary

- Cumbria's geography – its size and location – is a key driver of the county's economic structure and performance.
- Cumbria has an unusual "poly-centred" industrial structure and the £12 billion economy has strengths in
 - o agriculture/land-based industries and tourism on the one hand and in
 - o food manufacturing and nuclear and advanced manufacturing on the other.
- Cumbria also has strengths in logistics, construction, some technical services and in social care (linked to the elderly population).
- Cumbria LEP's 9 key sectors account for about 60% of the economy.
- There are wide variations across the county in economic success and performance in large part because of the location and concentration of different industrial sectors.
- Cumbria has a series of to some degree overlapping but distinct economic areas. This means that the industrial structure varies widely. At a local level some areas have a high and indeed overly high degree of dependence on certain sectors and businesses.
- Relative productivity performance is poor to middle ranking in a UK context. Cumbria sits 13% to 15% behind national productivity levels and productivity performance is patchy across sectors (and geographies).
- Much of the relative productivity difference is caused by Cumbria's industrial structure, but there is some evidence of below national productivity rates in some sectors, especially in private sector services and digital/creative.
- Cumbria performs better on other economic measures such as employment rate, relatively high wage levels and average household incomes, although this varies between areas within the county.
- Cumbria ranks in the top 25% of LEP areas in terms of how inclusive growth has been recently, but there is more to do, and Covid-19 has highlighted this to a greater degree.

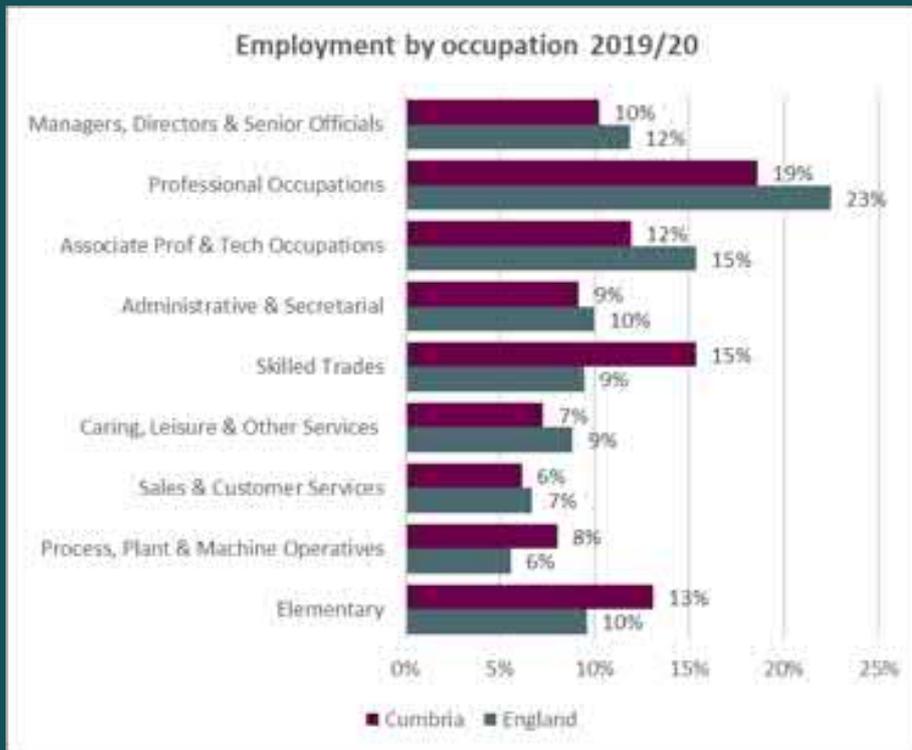




Employment by sector: Cumbria's biggest employing sectors are manufacturing, health, accommodation & food services, retail, and professional, scientific & technical services which between them account for over half of employment. All these sectors contribute to one or more of the LEP's 9 priority sectors, designated as such either for their local specialism and/or potential for growth. Cumbria has twice the national average concentration of employment in manufacturing and in some parts of the county, notably Copeland and Barrow, this concentration is around 4 times the average due to significant nuclear and defence manufacturing capability. Alongside this major manufacturing base is a significant land-based and tourism dependent rural economy giving Cumbria a unique sectoral structure. Cumbria has lower than average proportions of employment in financial services, IT and in professional, scientific & technical services.

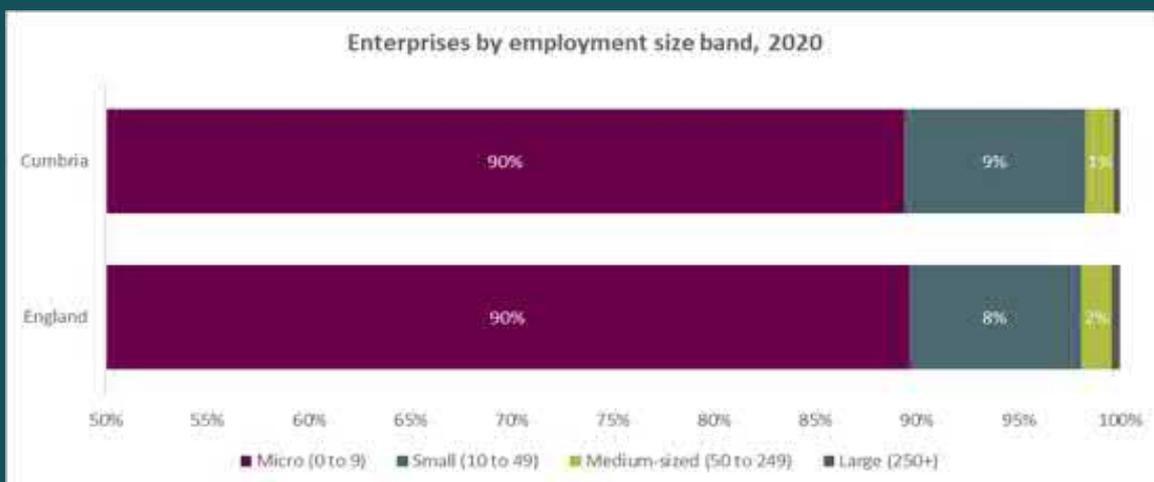
Whilst much of the local manufacturing base has been protected to some degree from the worst economic impacts of Covid, the same cannot be said for the substantial visitor economy which has been hugely impacted by repeated closures and travel restrictions which have effectively seen the sector endure "3 successive winters". The extensive use of furloughing, with parts of Cumbria consistently having the highest rates in the country, is evidence of the impact on the sector and its workforce and the reliance of other sectors in the county on trade from the visitor economy has also been exposed by the pandemic. Migration changes resulting from the UK's exit from the EU present a further challenge for a sector which has traditionally relied on overseas workers at peak times.

Source: Business Register and Employment Survey, 2019 (published 2020)



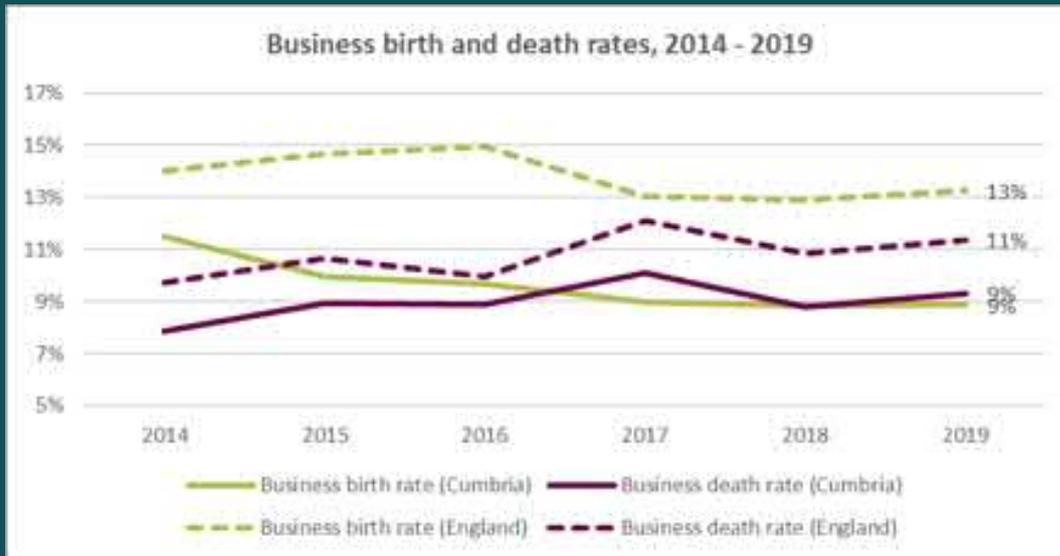
Source: Annual Population Survey, Oct 2019 - Sept 2020

Employment by occupation: The biggest employing occupations in Cumbria are professional occupations, skilled trades, and elementary occupations. The concentration of jobs in skilled trades is significantly above the national average (and the second highest of any LEP area), a finding which is linked to the substantial manufacturing sector in the area and which leads to significant demand for Apprenticeships. There are similar concentrations in process, plant and machine operative occupations and elementary occupations. However, the area has lower concentrations in higher level occupations such as managers, directors & senior officials, professional occupations and associate professional & technical occupations, and whilst this is partly a reflection of the sector structure in the area, it is also a trend which is known to cause recruitment and growth challenges for local businesses.



Source: UK Business Counts, 2020

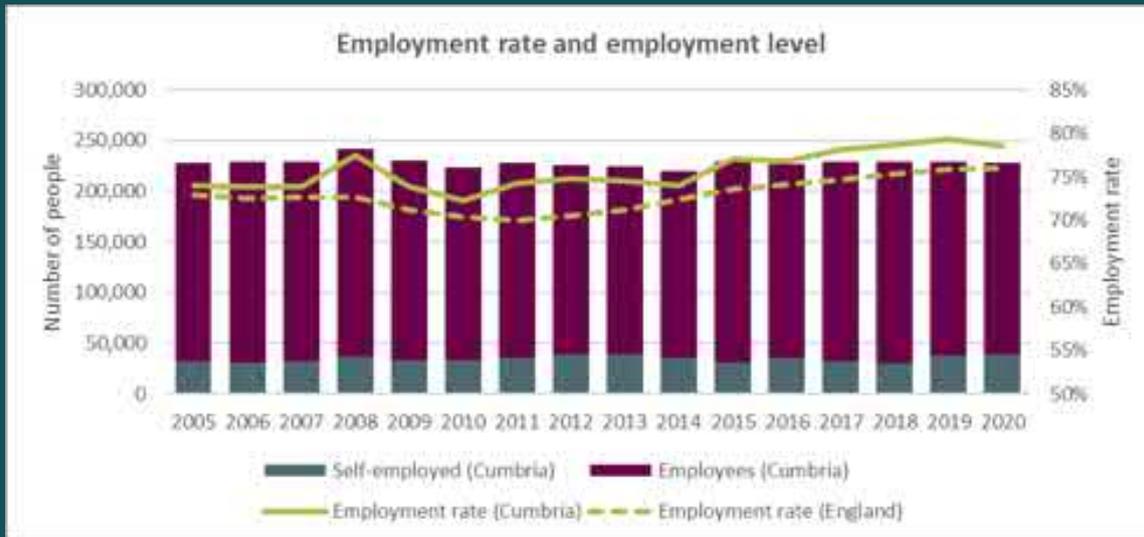
Enterprises by employment size band: In common with most areas, the registered business base in Cumbria is predominantly made up of micro and small businesses with 90% of registered enterprises employing fewer than 10 people, in addition to a substantial number of small, unregistered businesses not captured by the statistics. Many of these businesses are facing challenges because of Covid-19 which will have far reaching consequences for their growth potential and may impact on their plans to recruit new staff, particularly young people or those requiring training. Despite the predominance of small businesses, the geography of Cumbria means that in some areas there is significant employment dependence on a small number of large firms with the health of the local labour market strongly linked to trends within these firms and their supply chains.



Source: ONS Business Demography, 2014 - 2019 (published 2020)

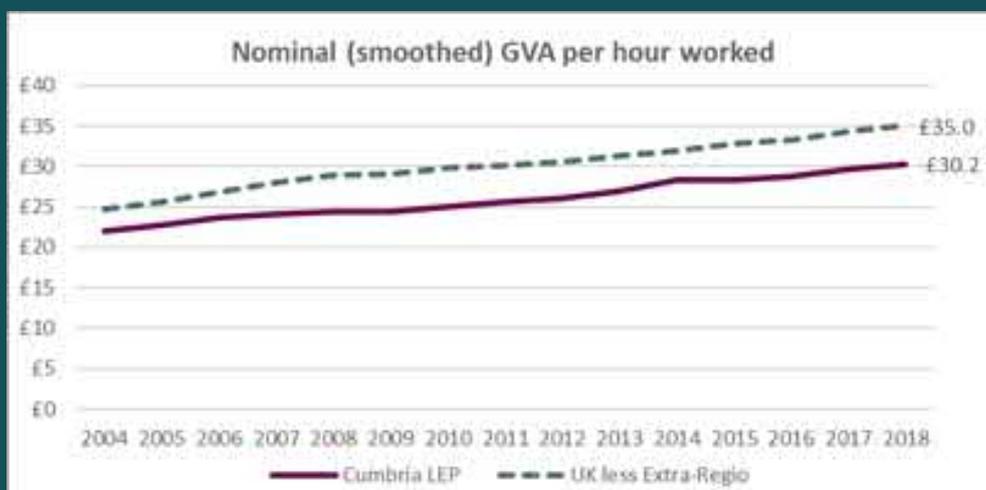
Business birth and death rates: Business birth and death rates (measured by registration for VAT/PAYE) have both traditionally run below the national average and in recent years, birth and death rates have been broadly similar, unlike the national trend where births have consistently exceeded deaths. This suggests a good degree of stability in the local economy, supported by further data from the same dataset showing that once registered for VAT/PAYE, Cumbrian businesses are more likely to remain so than average. However, it can also be argued that the data suggests a lower level of dynamism and possibly in entrepreneurial activity. Despite this, other datasources¹ suggest that significant activity takes place below the VAT/PAYE thresholds measured by these statistics and that with appropriate business support, many of those micro businesses can be encouraged to grow and become employing organisations. Covid-19 has presented many challenges for the growth prospects of smaller firms but local surveying during the pandemic has shown a willingness to flex and adapt to changing circumstances and the challenge will be to harness and develop this in the post-pandemic recovery phase and beyond.

¹. Banksearch Consultancy start-up data / FAME live business database (including non-registered enterprises)



Employment rate and level: Cumbria's employment rate has consistently been above the national average and has changed relatively little in recent years. However the LEP-wide average masks variations within the area and for example the most urban part of the area, Barrow, has an employment rate that runs well below that of the LEP area and country whilst employment rates in more rural areas are above the LEP average. The latter areas have smaller proportions of working age residents and the high employment rate, whilst a positive feature, also presents challenges for recruitment and for economic growth as labour supply is limited by demographics. Linked to the low employment rate in Barrow, the economic inactivity rate is also higher than average, and this is in part due to high rates of poor health and low rates of high-level qualifications among residents.

It is too early to assess the long-term impact of Covid-19 on employment levels. At the time of writing Cumbria's labour market has been extremely sensitive to the imposition and lifting of pandemic restrictions with furlough and claimant rates rising and falling more quickly than nationally but there are concerns about the long term impact not just on current jobs but on future growth which was already predicted to run behind national levels even before the pandemic.



Source: ONS Subregional Productivity, 2004 - 2018 (published 2020)

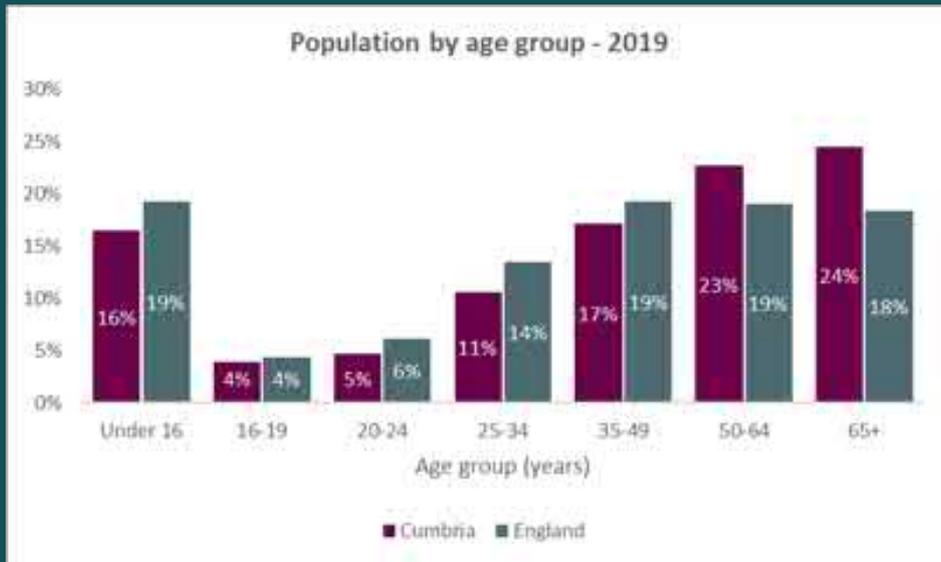
Nominal GVA per hour worked: Cumbria derives over a quarter of total Gross Value Added from the manufacturing sector (more than double the national average) and derives more than the national average from land-based and visitor economy related activities. Conversely, Cumbria derives less than average GVA from high value sectors such as computing/digital, financial services, professional scientific & technical services. This mix of sectors, together with the particular activities within certain sectors, is largely responsible for productivity levels that run below the national average for the LEP area as a whole and also for disparities within the area - productivity is higher in those parts of the area with a significant manufacturing presence and lower in areas where land-based and visitor economy activities dominate.

It follows that areas with high productivity are generally those with higher average pay rates and this is true within Cumbria. However, those areas with the highest average pay in Cumbria are also those with highest levels of unemployment and deprivation presenting a major challenge in lifting those outside the labour market into employment and improved prosperity.



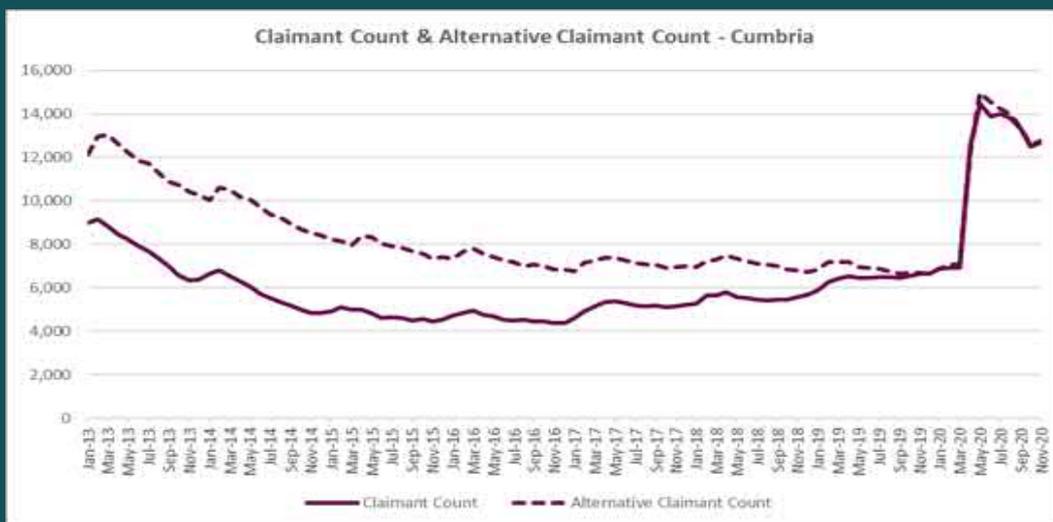
Source: Annual Survey of Hours and Earnings, 2014 - 2019

Median gross weekly wage for full-time workers: Average earnings are estimated to be below the national average for Cumbria but are higher than average in areas where manufacturing employment dominates. The LEP area is a relatively self-contained labour market and there is little overall difference between resident and workplace earnings. However there is commuting between districts and in more rural areas such as Eden, South Lakeland and Allerdale, resident earnings are higher than workplace earnings, reflecting both the nature of employment in those areas and the level of outward commuting to employment centres elsewhere in the county.

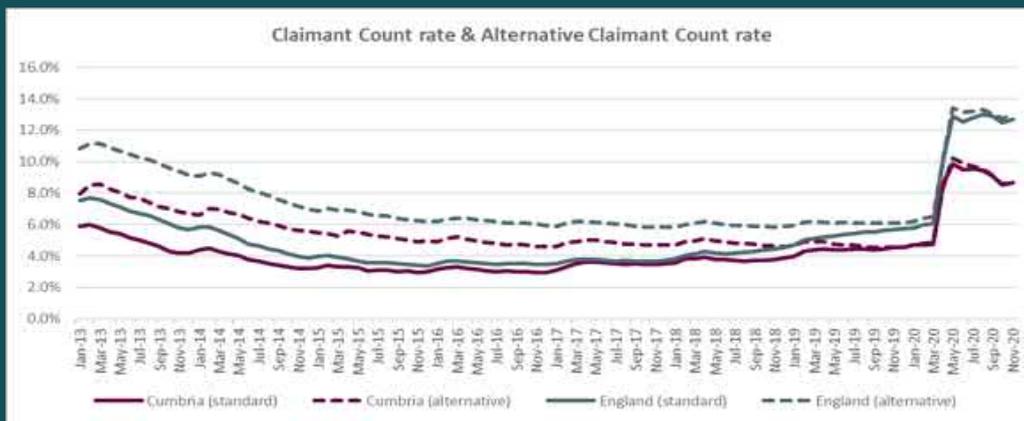


Source: ONS Mid-Year Population Estim 2019

Population by age group: Cumbria has relatively fewer young residents and more older ones than the national average and has seen barely any population growth in recent years (0.3% in the past 5 years compared to 3.4% nationally). Of note is that Cumbria's working age population has fallen by over 8,000 in the past 5 years which is contrary to increases in this age group in other areas. Projections suggest this trend will continue and Cumbria could see a further reduction of over 12,000 working age people by 2028. Although increases in economic activity rates, especially for over 60s, are expected to offset this to some degree, a net decline in the available labour force is still anticipated which presents obvious challenges for the labour market and could act as a constraint on post-pandemic recovery and future economic growth. However the pandemic, and in particular the use of technology and the shift to more remote ways of working resulting from it, present an opportunity to promote Cumbria as a place to live, work and invest via a Reboot Your Future campaign planned as part of Cumbria's Covid-19 economic recovery strategy.



Source: ONS claimant count & DWP Stat Xplore, January 2013 – November 2020

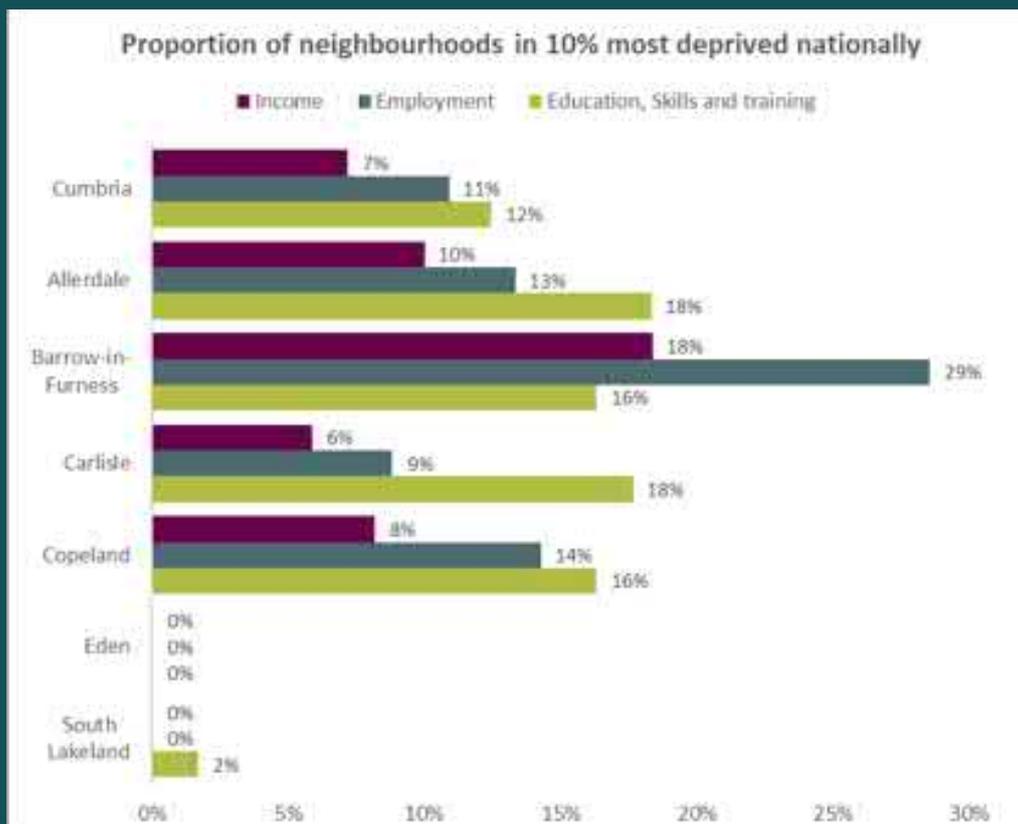


Source: ONS claimant count & DWP Stat Xplore, January 2013 – November 2020

Claimant Count and Alternative Claimant Count: Cumbria's claimant rates have historically run below the national average although this is not the case in all part of the county – there are concentrations of unemployment in Barrow, the west coast and in parts of Carlisle that are close to, and at times in excess of, national rates. In particular, claimant rates for young adults in Barrow are above the national average, despite average NEET rates and extremely high levels of apprenticeships. The pandemic saw steep rises in claimant numbers in Cumbria that were well in excess of the national average and particularly concentrated in those areas hitherto relatively little impacted by unemployment, notably Eden and South Lakeland where much employment is reliant on the visitor economy.

Since the initial pandemic peak in July 2020, claimant volumes have fluctuated in line with the imposition and lifting of economic restrictions, rising and fall more quickly than nationally which demonstrates both the flexibility and vulnerability of the labour market in Cumbria. There are risks that if employment opportunities reduce and the labour market becomes more competitive, those furthest away from the labour market will find it even harder to return to work and significant investment in skills is required to prevent inequality deepening. Support for the newly unemployed and for young unemployed are a priority in Cumbria's pandemic economic recovery strategy, co-ordinated with the delivery of sector-based work academies and effective information, advice, and guidance through initiatives such as Jobs Fuse.

Note: the Alternative Claimant Count models the impact of the rollout of Universal Credit, under which a broader span of claimants is eligible to claim and is a more consistent measure over time than the Standard Claimant Count.



Source: Index of Multiple Deprivation, MHCLG, 2019

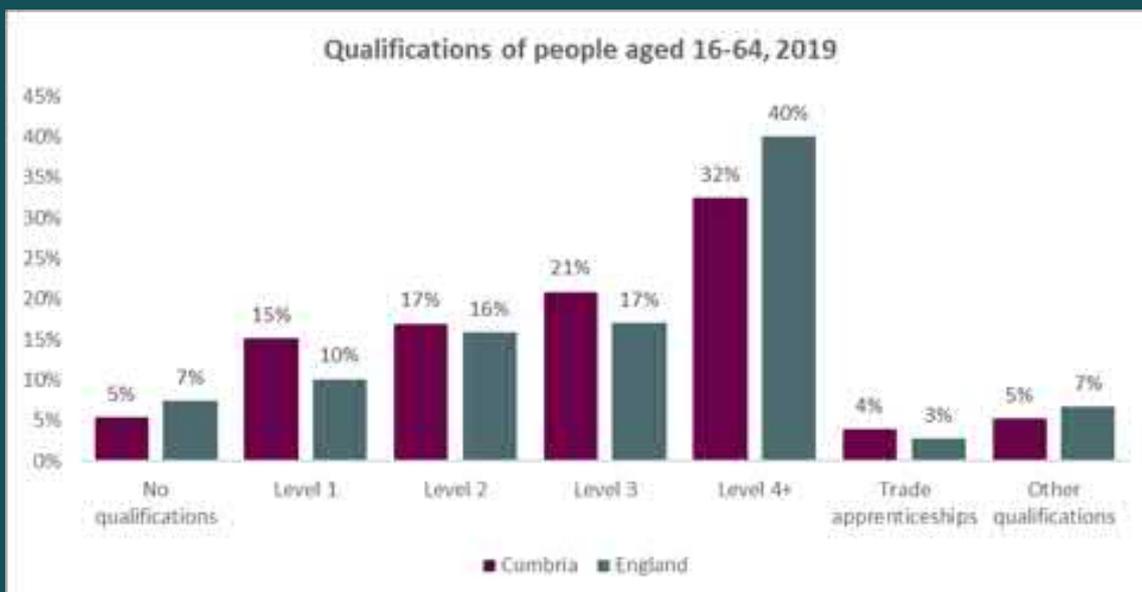
Income, Employment and Education deprivation: Levels of deprivation, especially relating to employment and skills, vary considerable across the LEP area – the west and Barrow, has more deprivation “hot spots” compared to the east of the county. This is despite the former areas having some of the highest apprenticeship rates in the country, mostly linked to the significant manufacturing presence in these areas. The key challenge is to narrow the attainment gap and ensure that young people and those furthest away from the labour market are provided with the skills and support to be able to take advantage of the opportunities available and reduce levels of deprivation.

SKILLS SUPPLY

Skills Supply – Summary

- Cumbria faces a challenging workforce supply issue. There is already a very tight labour market and limited spare capacity; forecasts suggest a severe worsening of overall skills supply relative to need and there is a need to consider how to:
 - Retain and attract more people of working age
 - Retain and attract more people with high level skills
 - Encourage more of our older residents to enter or stay in the labour markets
 - Find ways to increase employment rates amongst those out of the labour markets.
- We have an ageing workforce which is also driving a growing need for replacement demand and ways to upskills the existing workforce.
- The proportion of our workforce with high level qualifications has increased considerably since 2007 (from 25% to 31%) but there is still a significant gap on the national average (around 39%).
- In absolute terms, there is a relatively thin pool of higher levels skills (measured by qualifications or occupations) which, despite increasing as a proportion of overall skills, has varied little in absolute volume terms. There is also growing demand on this pool which is spread across the county in what are in effect separate labour markets.
- The evidence suggests there is strong performance in vocational education and training, with a well-functioning apprenticeship system with strong employer engagement.
- Within our school system there are wide variations between individual schools and geographies and there are concerns about the performance and progress of disadvantaged pupils at GCSE level.
- Overall unemployment rates are low, but youth unemployment rates are above average in some areas.
- There are significant concentrations of worklessness and low skills in some of our communities - often ones with large and important employers and growing employment (eg Barrow) - and the pandemic risks widening this inequality gap.

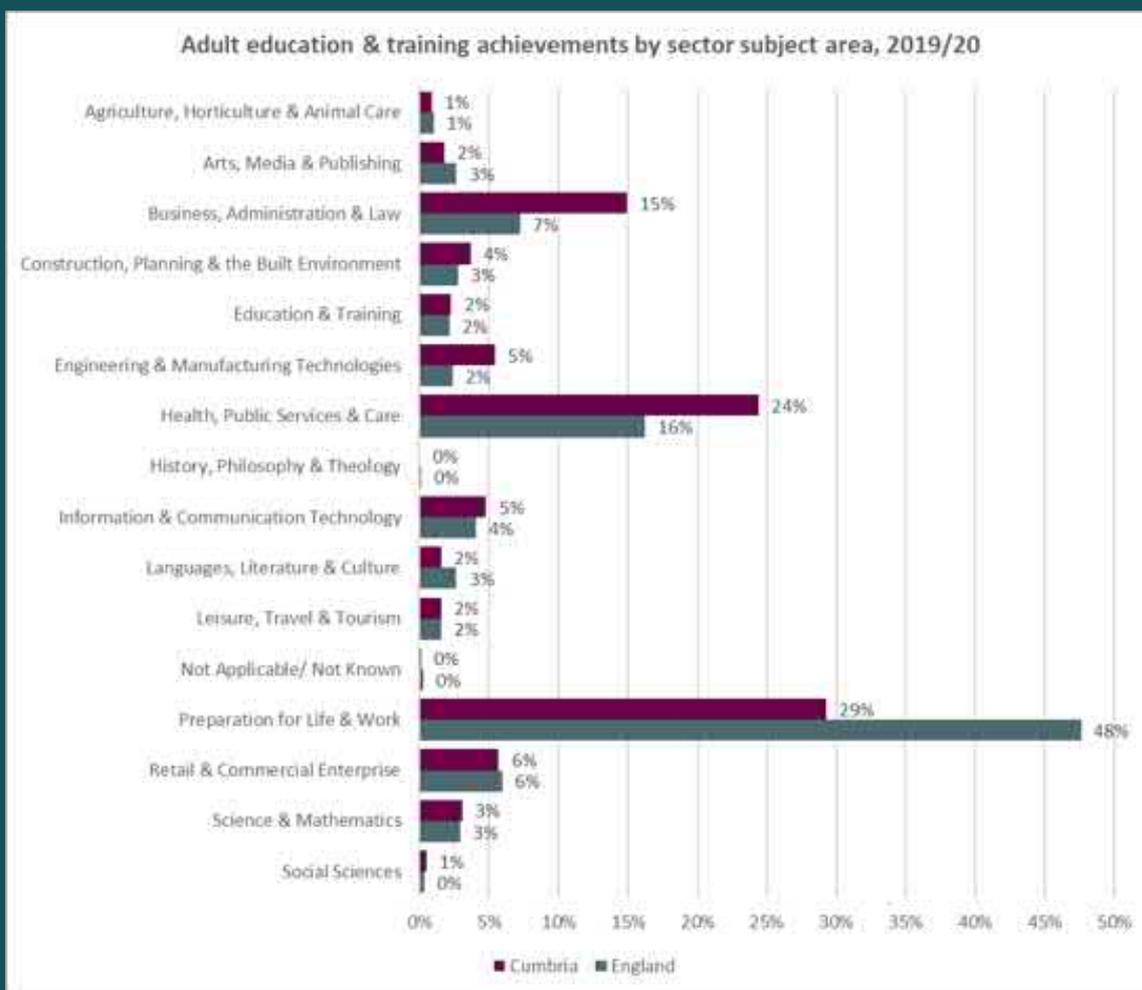




Source: Annual Population Survey, January 2019 – December 2019

Cumbria has a lower proportion of its workforce qualified to level 4 or more than either regionally or nationally although this proportion has improved slightly over the last decade. The proportion with level 3 qualifications is higher than average as is the proportion holding a trade apprenticeship (the latter group does not include modern apprenticeships which are included under the relevant level). This reflects the importance of manufacturing and skilled trades especially in the west and south of the county.

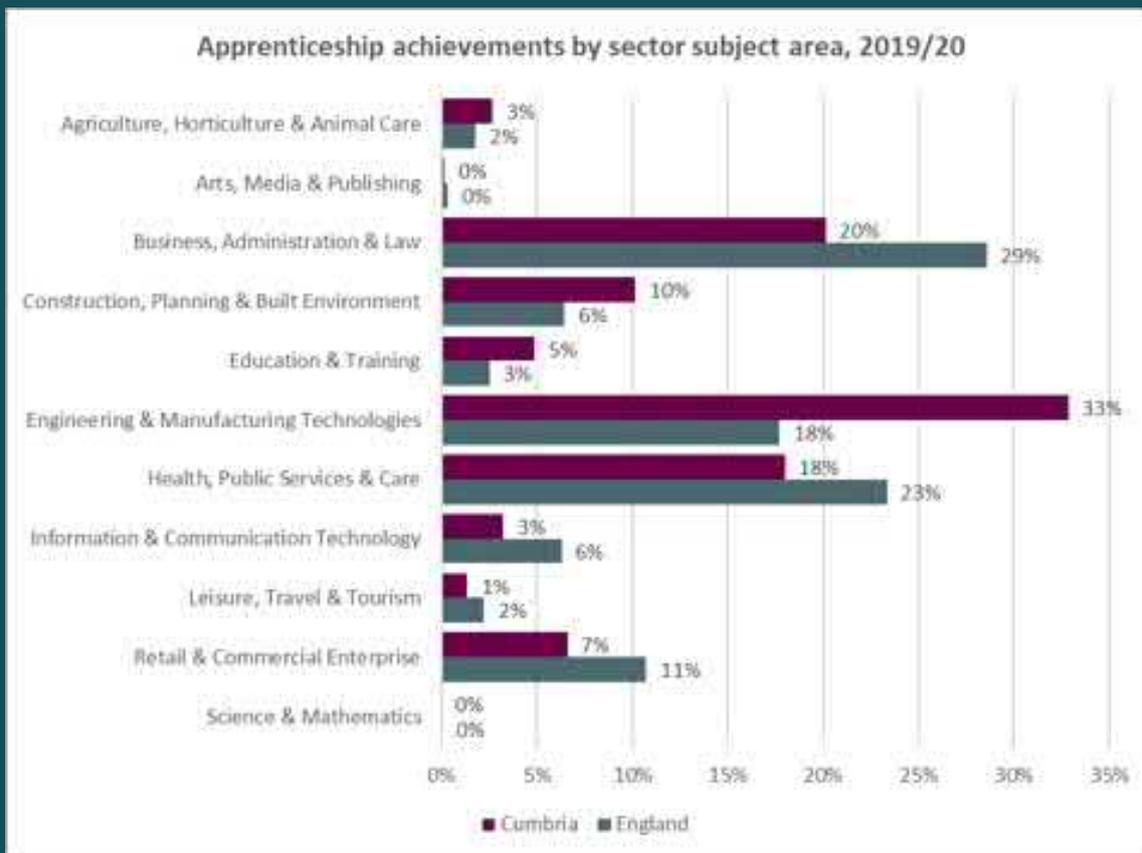
As well as having one of the lowest proportions of residents with high level qualifications, Cumbria has the smallest pool of such individuals in absolute terms and this volume has changed little over the past decade. Taken alongside Cumbria's geography this means the availability of higher-level skills is modest at county level and particularly so within each travel to work geography. As a result, the labour market for higher level skills is particularly thin, creating an issue for employers and in attracting people to live and pursue a career in Cumbria. This is despite around 3,000 Cumbrian residents achieving HE qualifications each year and a similar volume of HE qualifications being delivered by HE institutions within the county.



Source: Further Education & Skills data, DfE (published 2020)

FE Education and Training Achievements: Cumbrian residents (aged 19+) achieved over 6,000 adult education and training learning aims in 2019/20 (through funded training). Over a quarter of these were in “preparation for life & work”, although this proportion was well below the national average (48%). Conversely, Cumbria delivered a higher proportion of achievements in health, public services & care, in business administration & law and in engineering & manufacturing technologies (although volumes were low in the latter). These achievements reflect the nature of the economy and demographics in Cumbria and the demand for skills from employers in industry sectors relative to the national average.

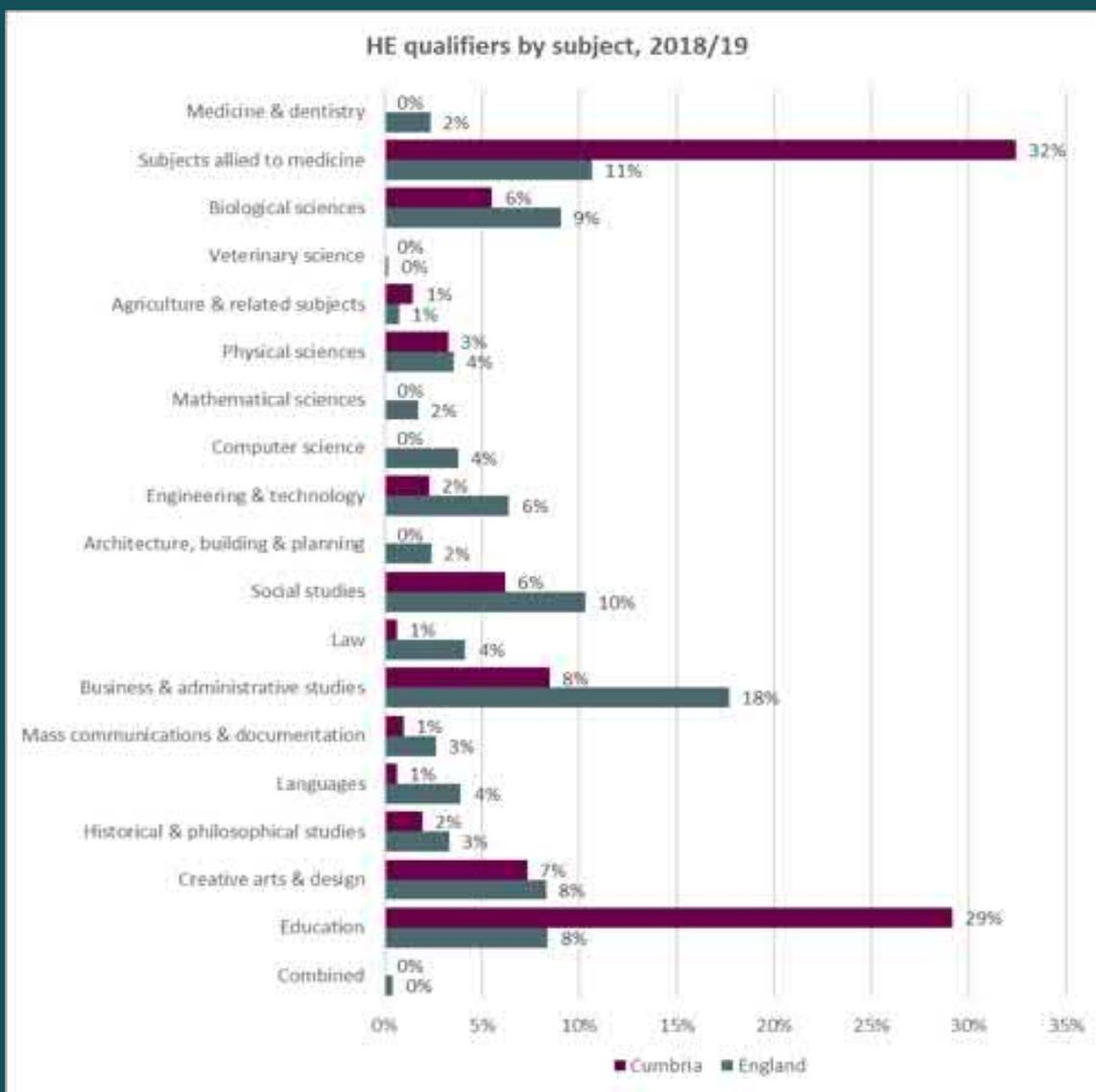
In 2019/20 compared to 2017/18 the volume of funded achievements fell by over a third (down from 10,000 to 6,300) with a decline across all subject areas. The volume of achievements in preparation for life & work fell by 1,400 (-43%) while there were 600 fewer in health, public services & care, 500 fewer in retail & commercial enterprise and 275 fewer in business, administration & law. Despite these falls in volume, the relative share of achievements in health, public services & care and in business, administration & law increased by 3% each with a corresponding decline in share accounted for by retail & commercial enterprise and preparation for life & work.



Source: Apprenticeships data, DfE (published 2020)

Cumbria delivered over 2,000 Apprenticeship achievements in 2019/20 with a third of these in engineering & manufacturing technologies reflecting the strong involvement with apprenticeships from businesses in this sector. This is almost double the national proportion of achievements in this subject area. Cumbria also has proportionately more achievements in construction subjects but fewer in business administration & law, health, public services & care and in retail.

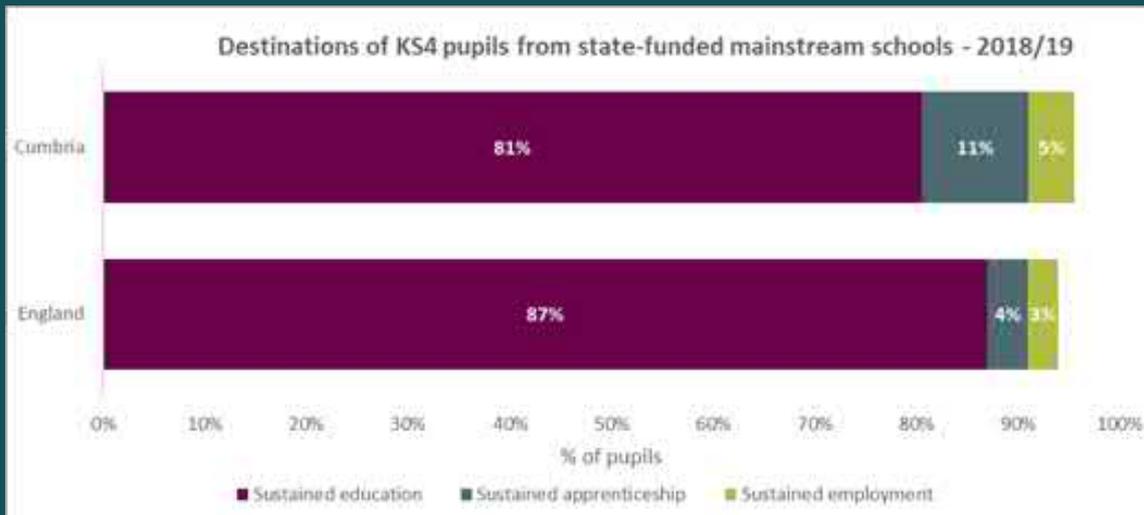
The volume of apprenticeship achievements has fallen by 45% in the last 3 years, a trend seen across all levels but not all subjects. Achievement volumes have remained stable in construction and in education & training and have reduced at a lower rate in engineering & manufacturing technologies and information & communication than the average across all subjects. However, achievement volumes have fallen markedly in retail (down 75%) and in business administration & law and in health, public services & care (both down by more than 50%). Within the context of falling volumes, the proportion of achievements accounted for by apprenticeships in engineering & manufacturing technologies has increased from 25% to 33% in the past 4 years and the proportion in construction has increased from 6% to 10%. Conversely, the proportion of achievements accounted for by retail & commercial has fallen from 14% to 7% and in business administration & law from 25% to 20%. This, together with the previous data on FE achievements, indicates a clear shift away from retail & commercial enterprise which has seen falling volumes and a falling share of activity across both activity streams.



Source: HESA, 2018/2019 qualifiers (published 2020)

HE Qualifiers: There were 3,070 HE qualifiers from Cumbrian based HE institutions in 2018/19, a third of them in subjects allied to medicine and almost a third in education subjects, both well more than the England profile. There were relatively fewer qualifiers in business & administrative studies, social studies, and engineering & technology subjects. However, this data only captures the range of HE provision provided by the University of Cumbria (including its London campus) and not that provided by other institutions with a presence in Cumbria. Therefore, it does not fully reflect the HE offer in the county or the demand for HE from Cumbrian residents and businesses.

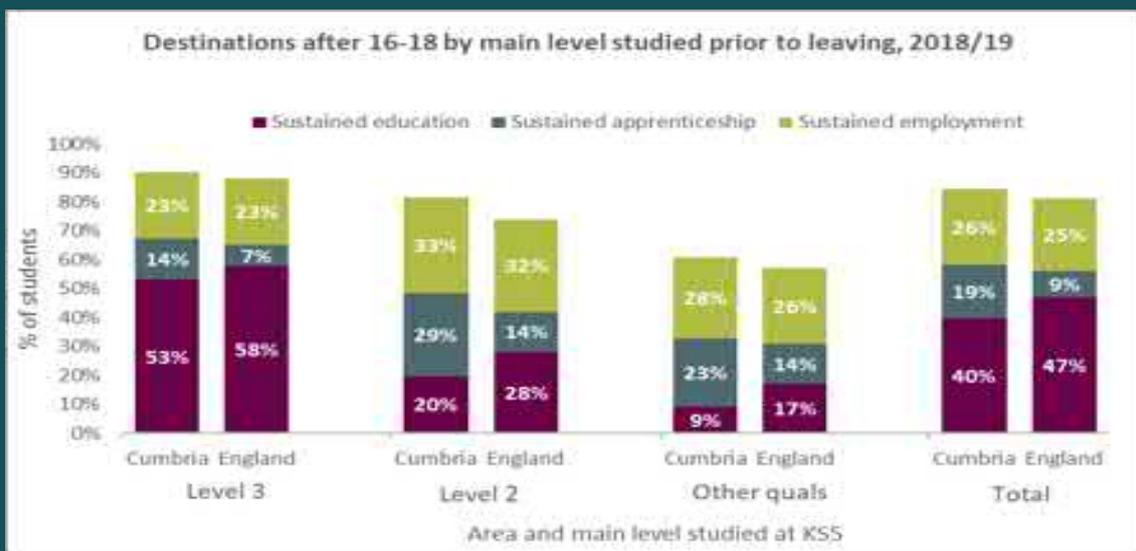
In recognition of the limitations of the published data on HE provision/outcomes, a piece of work is planned with local HE analysts to explore HE data in depth in order to get a more comprehensive overview of HE delivery in Cumbria, HE accessed by Cumbrian domiciled residents and HE learners whose ultimate destination after study is Cumbria.



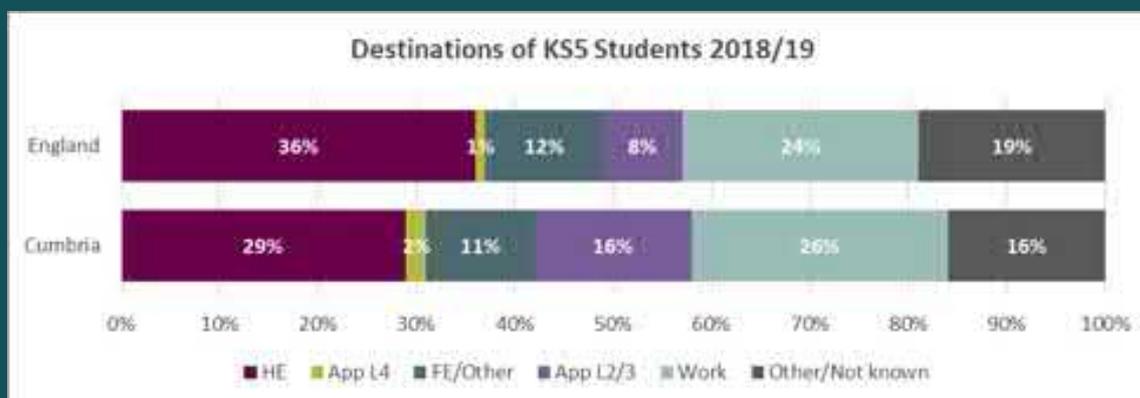
Source:KS4 destination measures, DfE 2018/19 (published 2020)

KS4 destinations: Cumbria has a slightly higher proportion of KS4 (16 years) pupils going into sustained learning or employment destinations than nationally (96% v 94%) and in particular a higher proportion in a sustained apprenticeship (11% v 4%) with a correspondingly lower proportion in sustained education. The level of entry to apprenticeships is the highest of any SAP area in England (the next nearest is Humber with 7%). This is in line with Cumbria's long tradition of apprenticeship delivery and is in large part driven by demand from the substantial manufacturing sector and its supply chain.

There are possible early signs that the pandemic may be having an influence on young people's choices and opportunities. In January 2021 there was reduction of 2.8% in the proportion of 16/17 year olds in Cumbria participating in apprenticeships or in employment with regulating training compared to the same time last year (down from 13.4% to 10.6%) with an increase of 2.1% in the proportion continuing in full time education/training. This may reflect a reduction in employer opportunities and / or potentially some caution among young people at a time when a national "lockdown" is still place with large swathes of the economy closed and is clearly something to monitor in the coming months.



Source: 16-18 Destination Measures (State-funded schools and colleges), DfE, 2018/19 (published 2020)

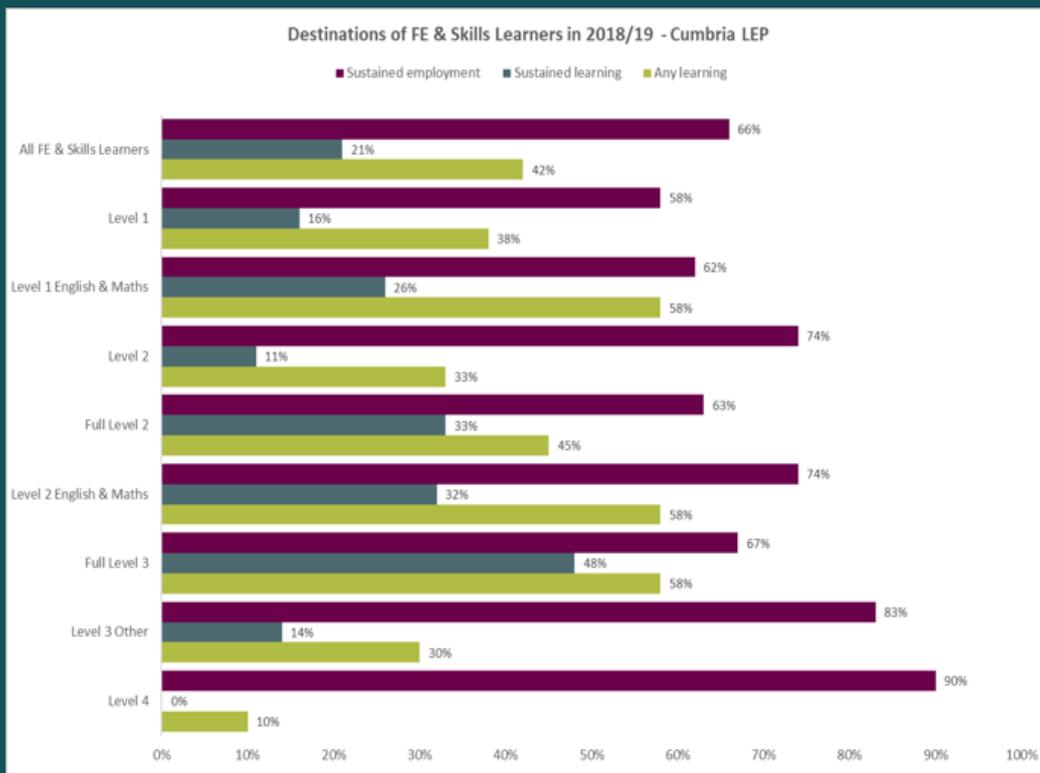


Source: 16-18 Destination Measures (State-funded schools and colleges), DfE, 2018/19 (published 2020)

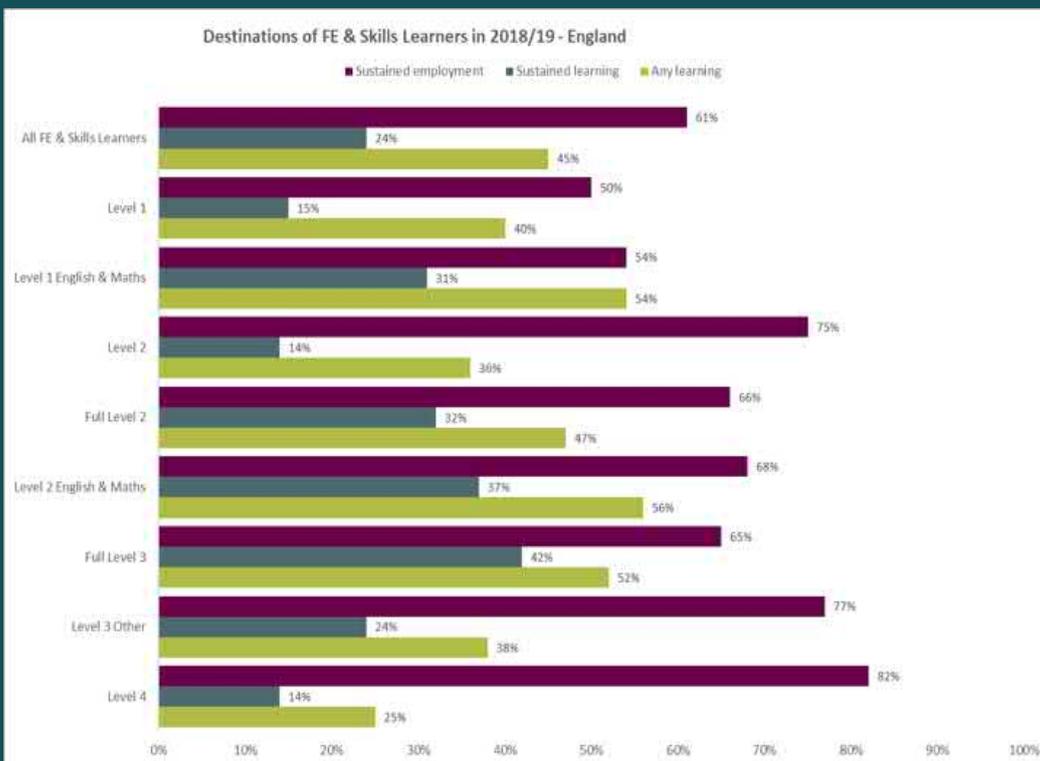
KS5 destinations: In Cumbria, 84% of Key Stage 5 leavers (16-18 education) from 2017/18 were in a sustained employment or learning activity in 2018/19 which is above the national average of 81%. Almost a fifth of these (19%) were in a sustained apprenticeship, more than double the national average (9%) and the highest of any LEP area (next nearest is Worcestershire with 13%). Proportionately fewer were in sustained education (40% v 47%).

The importance of apprenticeship routes in Cumbria is evident from the fact that across all levels of study at 16-18, the proportion leaving to enter an apprenticeship was double the national average. In the case of those that had studied at level 2 in KS5, almost a third (29%) went on to an apprenticeship destination.

A further breakdown of destination types by level shows that a lower proportion of KS5 leavers in Cumbria go into Higher Education or a Level 4 Apprenticeship than the national average (31% v 37%). In light of an already increasing demand from employers for higher level skills and forecasts for this to increase (see Working Futures analysis in Annex B), this is a key priority for action to increase the supply of high level skills into the local labour market.



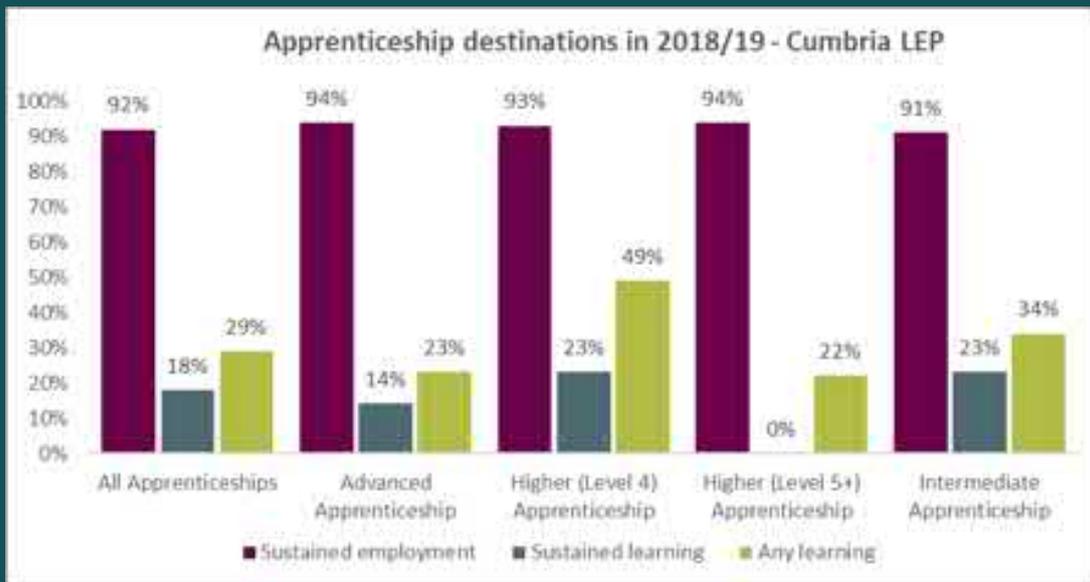
Source: FE outcome based success measures, 2018/19 achievements, DfE, (published 2020)



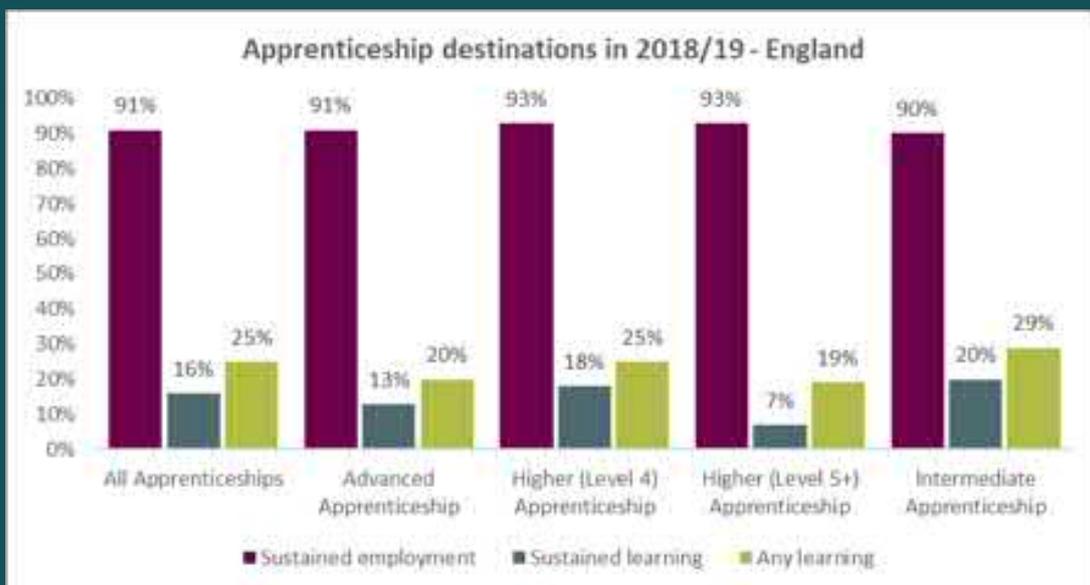
Source: FE outcome based success measures, 2018/19 achievements, DfE, (published 2020)

FE and skills destinations: Cumbria had over 4,700 FE & Skills leavers in 2017/18 and of these 66% were in sustained employment when followed up the following year meaning that over 3,100 FE & Skills leavers entered the labour market. This proportion is higher than the national average of 61%.

A fifth of learners were in sustained education the year after leaving learning which is slightly below the national average (21% v 24%). However, the proportion of leavers after Level 3 study who were in sustained learning was higher in Cumbria than nationally (48% v 62%).

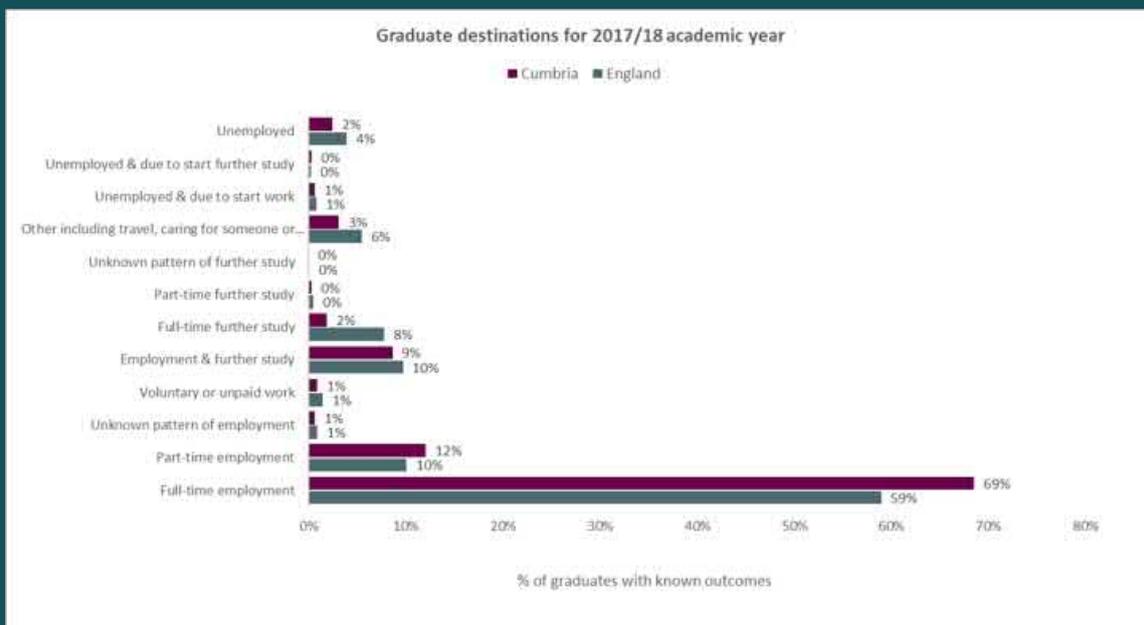


Source: FE outcome based success measures, 2018/19 destinations, DfE (published 2020)



Source: FE outcome based success measures, 2018/19 destinations, DfE (published 2020)

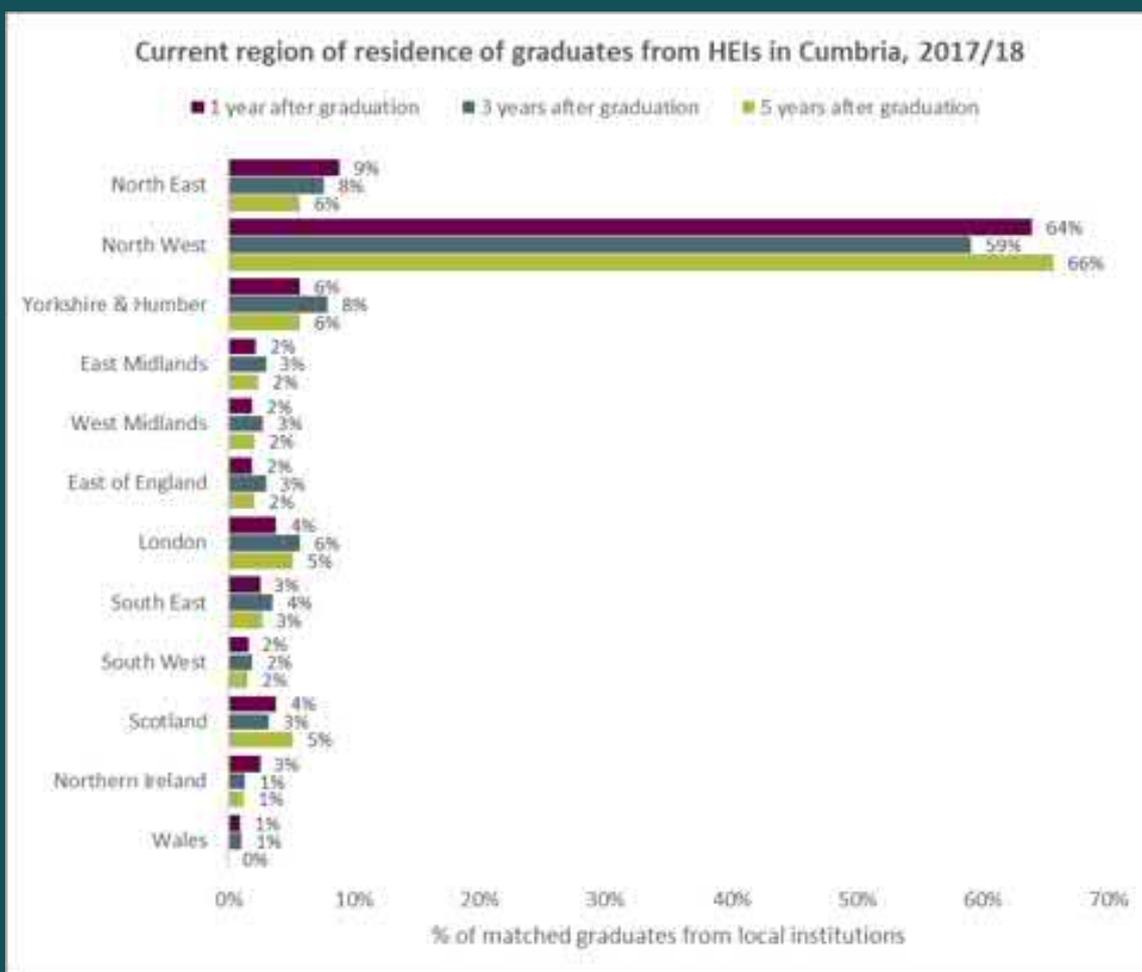
Apprenticeship destinations: Cumbria has a marginally higher proportion of Apprenticeship leavers entering sustained employment than nationally and this is mirrored across all levels. This is also true for progression into learning and reflects Cumbria's very well established and significant Apprenticeship provision which accounts for a much more significant element of post 16 learning than is the case elsewhere.



Source: HESA, 2017/18 graduates (published 2020)

HE graduate destinations: Unlike the earlier HE qualifiers data, this data on HE destinations does include some provision offered by providers other than the University of Cumbria, although UoC still accounts for the vast majority. However, the geographic mapping does not match provision at Carlisle College, Newton Rigg College to Cumbria, or bodies such as the Dalton Institute as the parent provider is located outside the area. Taking that caveat into account, HE graduates learning in Cumbria are more likely than the national average to go into full time employment (69% v 59%) but there are no major differences in other destinations.

As noted previously, published data on HE provision/outcomes has several limitations and as a result a piece of work is planned with local HE analysts to explore HE data in more depth in order to get a more comprehensive overview of HE delivery in Cumbria, HE accessed by Cumbrian domiciled residents and HE learners whose ultimate destination after study is Cumbria.



Source: Graduate Outcomes in 2017/18, DfE, (published 2020)

Graduate retention: This data captures graduate region of residence for graduates from the University of Cumbria and suggests a high degree of retention within the North West (two thirds resident in the region after 5 years) with the neighbouring North East accounting for the next highest proportion.

As with other HE data, there are limitations and this dataset only captures destinations for students at the University of Cumbria (across all sites) and not for other HE provision in Cumbria. In addition it does not go below region and therefore it is not possible to assess how many students who studied in Cumbria remain in the county after study, nor does it show how many students who studied elsewhere may end up in Cumbria after study. As part of the HE data project planned for 2021, we will examine destinations data in more depth to see if more granular analysis is possible.



Source: Employer Skills Survey, 2019 (published 2020)

Employer provided training: The incidence of employer training is similar in Cumbria to nationally (72% providing some form of training compared to 71%). The highest proportion provide both off the job and on the job training (almost half of those providing training offering both types). Local survey data from the Cumbria Business Survey (conducted Q4 2020) suggests these levels of training dropped during the pandemic (56% providing training) and that, understandably, this was mostly in off the job training. The survey also showed continued uncertainty about future training with only 54% planning any in the next 12 months. The main reason given for not training was the businesses didn't feel any was required (65% of those not planning training) with much lower proportions saying their business was too small (12%), that there was no funding for training (8%) or citing Covid related issues (7%).

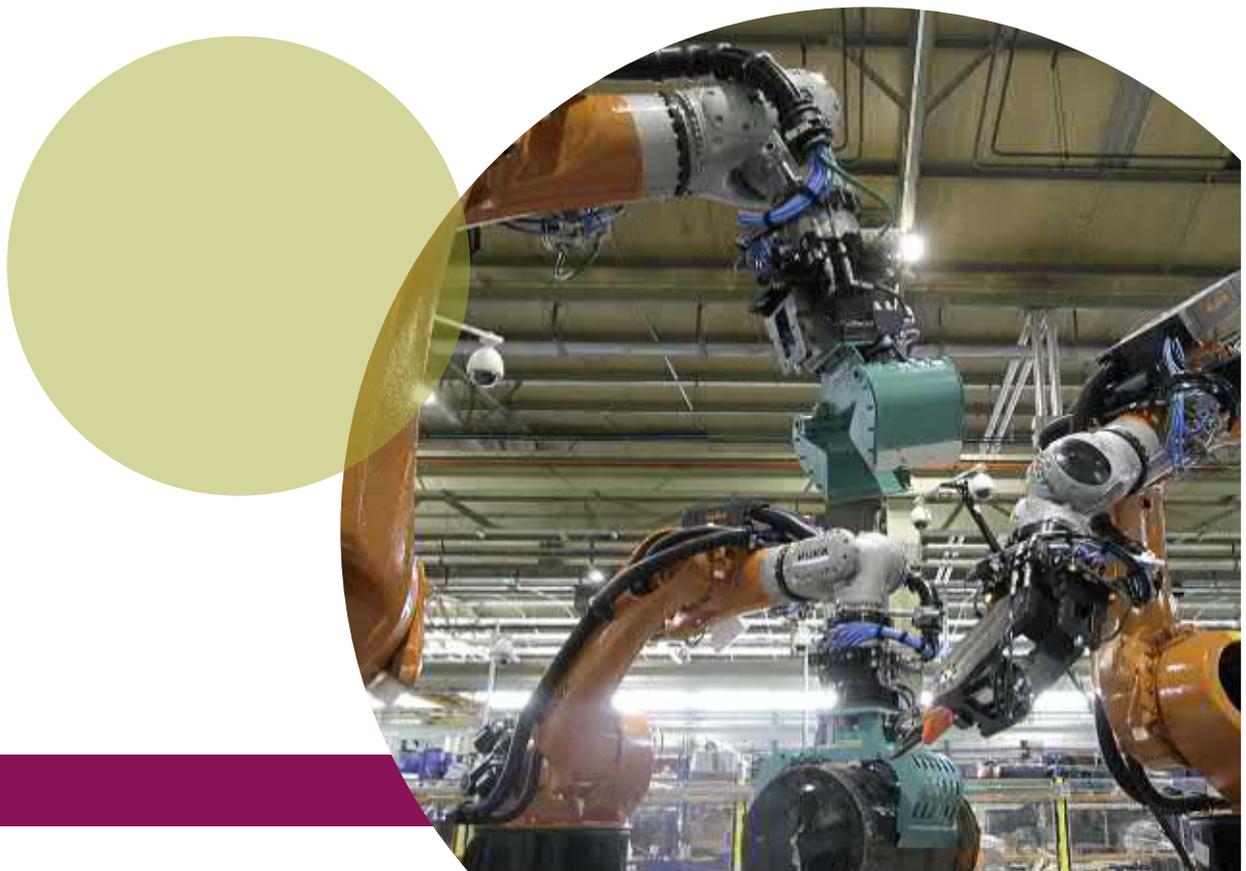
Also from the Cumbria Business Survey 2020, we can see that 49% of private sector business have a training plan and/or a training budget with the propensity to have these increasing with business size and also being more prevalent among businesses in private sector education, health and finance businesses. The existence of training plans and budgets is an important factor in the likelihood of a business engaging in training activity - 61% of businesses that have provided off the job training have a training plan in place whereas only 21% of those that haven't provided any training do. This suggests that supporting businesses in taking a planned approach to training is a key area in increasing levels of participation.

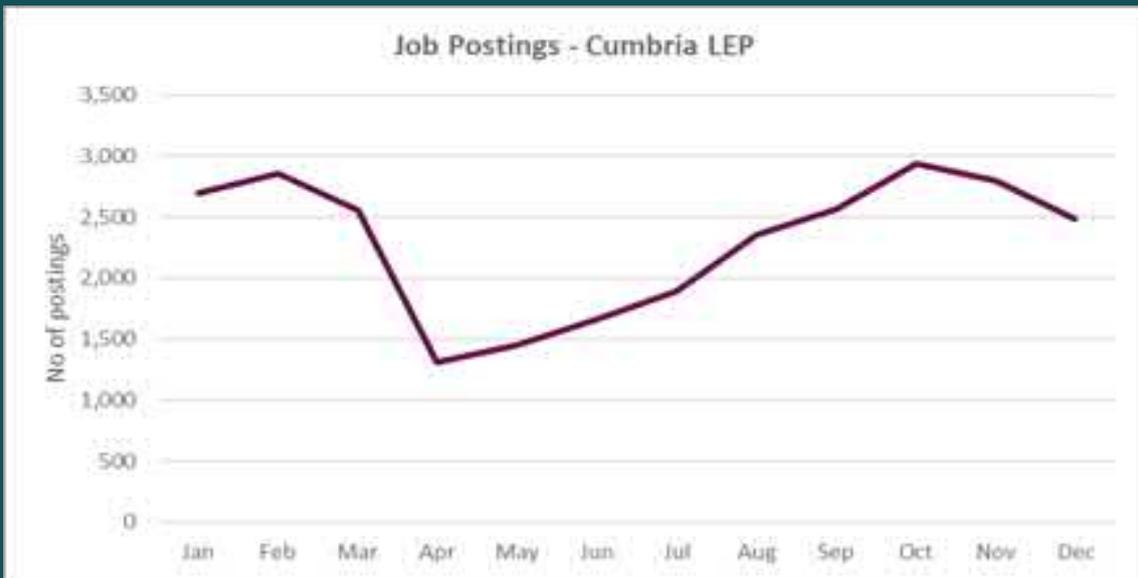
Further details of the Cumbria Business Survey are in Annex B and the full report will be published in Spring 2021.

SKILLS DEMAND

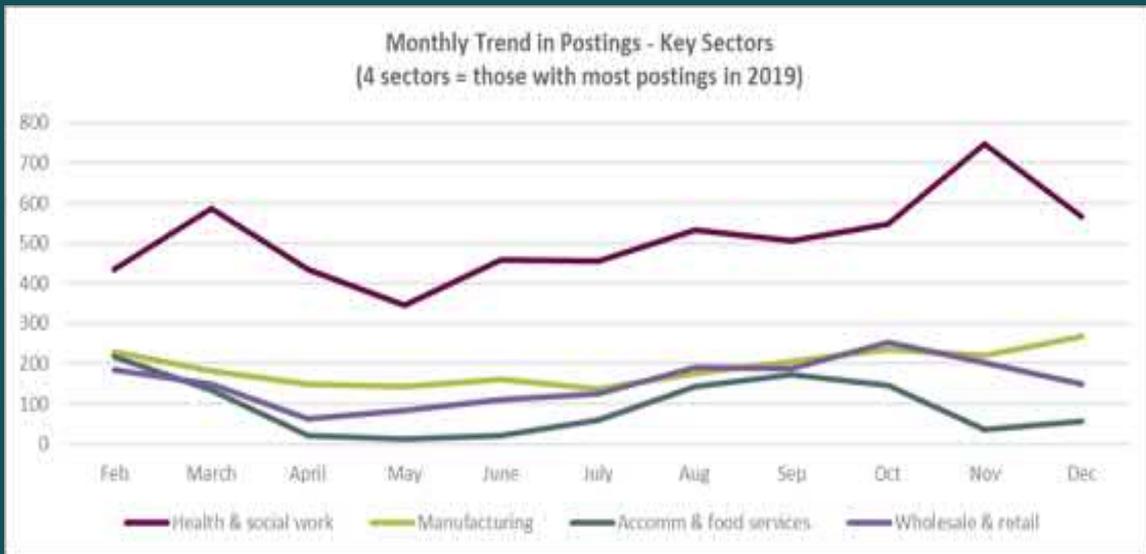
Skills Demand - Summary

- There has been a limited employment growth in recent years and projections suggest this will continue in the next 10 years, lagging that of the nation.
- Despite limited employment growth, there will be significant demand from the need to replace existing staff, a factor exacerbated by the ageing profile of the workforce and a declining pool of working age residents.
- Projections suggest a net demand for 90,000 jobs to be filled in the next 10 years whilst estimates suggest only around 3,000 young people will join the workforce each year
- Demand will be most acute in caring & personal service occupations, sales occupations, managers, and health professionals.
- Over third of replacement demand jobs are expected to require level 4 or above qualifications which is higher than the current share of such qualifications among the working age population.
- The prevalence of hard to fill vacancies in Cumbria is above the national average and this is particularly acute in manufacturing and hotels & restaurants, sectors which between them account for more than a quarter of employment.
- A fifth of businesses in Cumbria report skills gaps among their current workforce and many report these are having a major impact on their business.

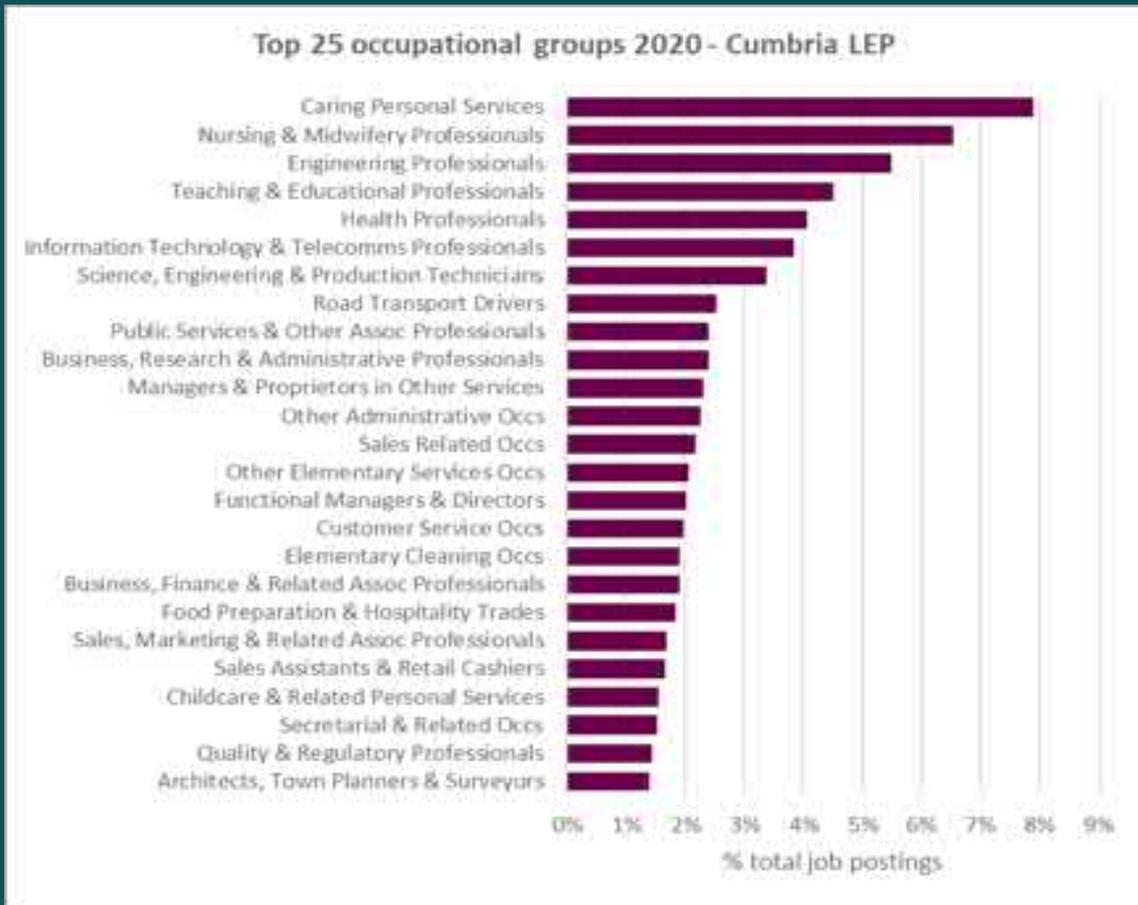




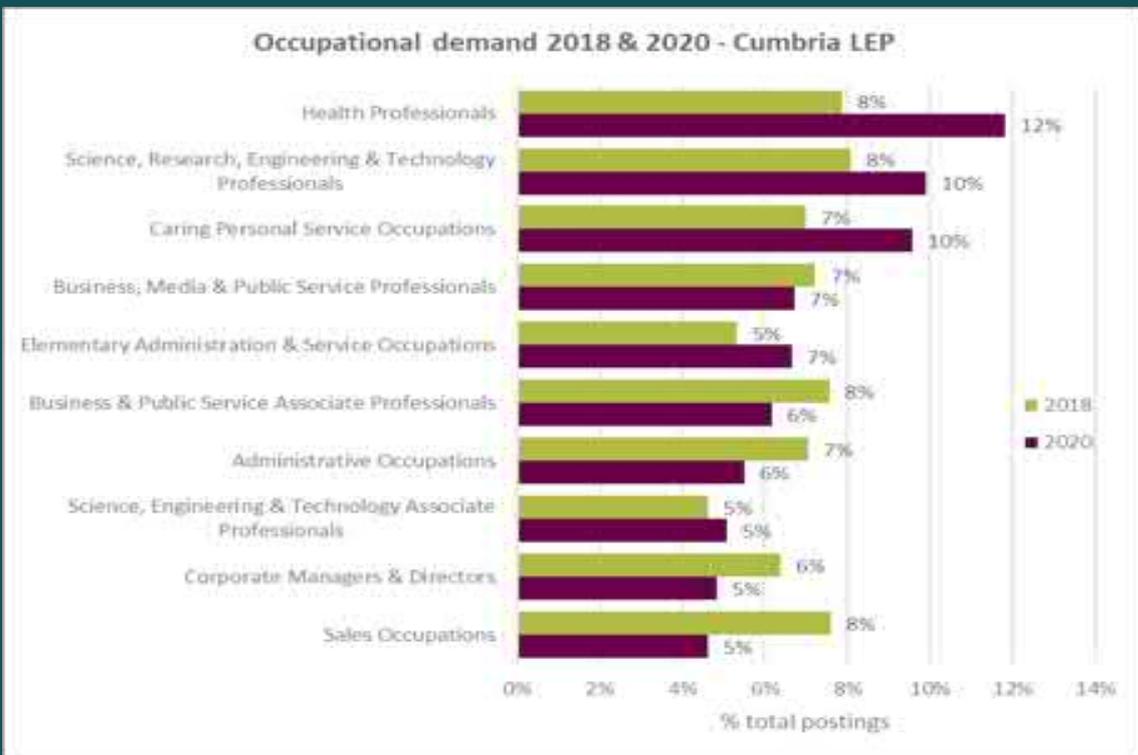
Source: Labour Insight (Burning Glass Technologies) 2020



Source: Labour Insight (Burning Glass Technologies) 2020



Source: Labour Insight (Burning Glass Technologies) 2020



Source: Labour Insight (Burning Glass Technologies) 2018 & 2020

Online vacancies: Cumbria LEP utilises the Labour Insight online job postings monitoring service. The impact on job postings at the height of the pandemic in 2020 was very apparent although levels returned to those seen before the pandemic when restrictions were first eased in the summer. Much of this was driven by the need for the visitor economy to recruit staff that under normal circumstances would have been recruited much earlier in the year. The variations by key sector can be seen in the second job postings chart which focusses on the 4 industry sectors which usually account for the most online job postings in Cumbria. Vacancies in the health sector increased following the first wave of the pandemic, those in manufacturing remained stable whilst those in retail and hospitality have tracked the imposition and lifting of restrictions.

In terms of occupations, postings for occupations relating to health, engineering and teaching dominated in 2020, particularly at professional level. Lower down the list were occupations in sales, food preparation, childcare, customer services etc. However, to some extent this reflects recruitment methods at different levels of occupation with senior roles more likely to be formally advertised than other roles which can be recruited by word of mouth or similar less formal routes.

By comparing the share of postings by occupation in 2018 and 2020 we can see that postings for health and care roles have increased as a proportion of all postings as have those for science, engineering & technical professionals whilst conversely the share of postings for sales occupations has fallen. These trends have undoubtedly been influenced by the pandemic and resulting closure of large sections of the economy for much of 2020 and we will be monitoring the data closely during 2021 † assess the extent to which these trends continue.

Note: We have not included a comparison of the volume of postings over time as the job boards incorporated into the dataset can change. This affects the overall volume of postings but is less likely to impact on the relative distribution of postings by occupation which is therefore more meaningful as a comparison over time.

Cumbria LEP	
Sectors with highest forecast growth (2017-2027)	Sectors with lowest forecast growth (2017-2027)
1. Arts and entertainment	1. Food drink and tobacco
2. Information technology	2. Agriculture
3. Professional services	3. Rest of manufacturing
4. Health and social work	4. Transport
5. Real estate	5. Education

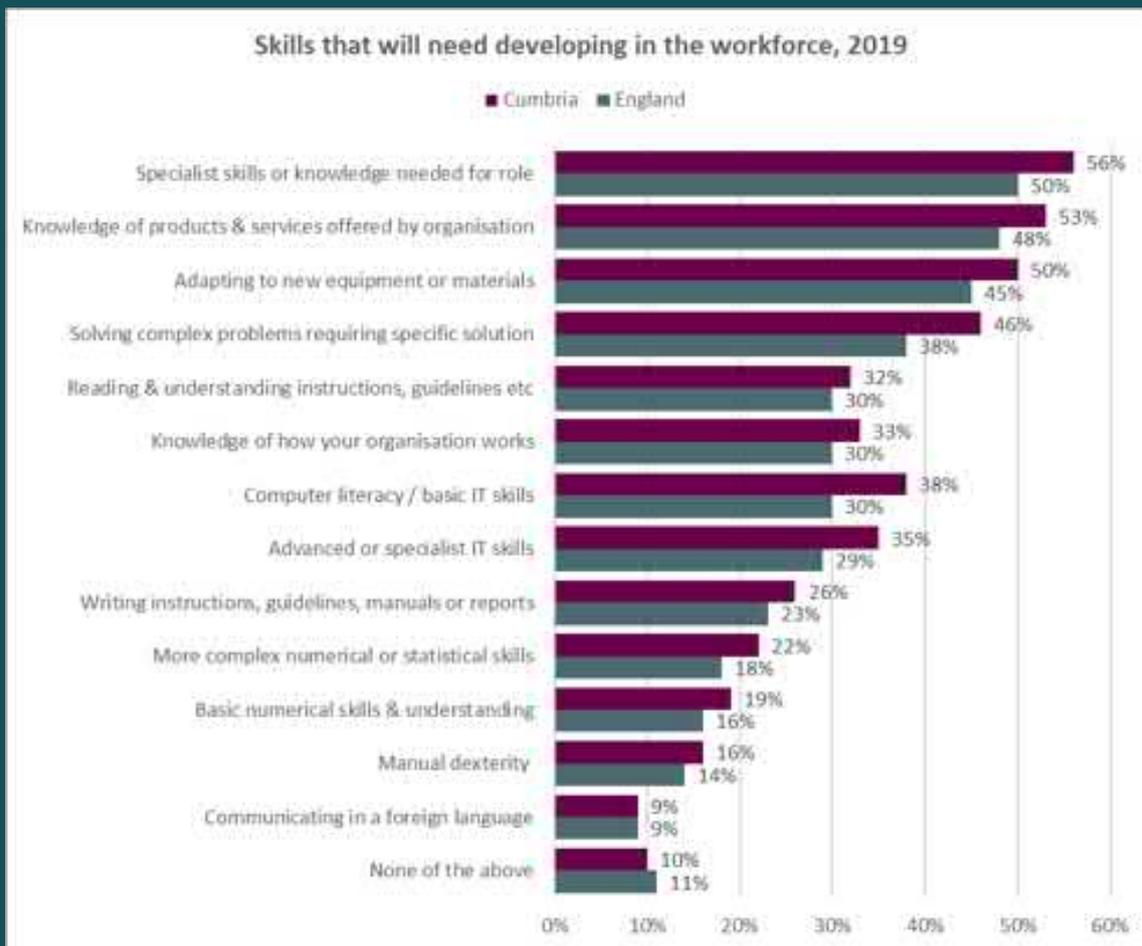
Sector growth forecasts: These Working Futures projections were generated before the Covid-19 pandemic and also before the nature of the UK's exit from the EU had been agreed and the authors acknowledge that the macro forecast is "probably at the more conservative end of the spectrum in terms of the negative magnitude of GDP impacts following Brexit". Therefore they should be treated with a degree of caution in light of the significant economic shock experienced by the UK economy in the past 12 months – a 9.9% downturn in GDP in 2020, record levels of redundancy despite job support measures, and increasing evidence of the disparity of labour market impacts across sectors, occupations, age groups, income groups and geographies.

Working Futures anticipated minimal employment growth in Cumbria of just 0.2% per annum between 2017 and 2027, equating to 5,200 additional jobs. No sector was projected to grow by more than 2% and none by less than 2% suggesting a broadly static labour market, although in larger sectors, even 1% growth or decline can equate to 2,000+ job losses or gains.

Cumbria LEP receives quarterly projections from Experian since before the pandemic and these are explored in more detail in Annex B but in summary, the pre-pandemic projections also suggested a relatively static economy in Cumbria compared to growth nationally. When pandemic impacts are factored in, they show a sharper decline in Cumbria and slower recovery, largely due to Cumbria's reliance on the hospitality sector, together with the pre-existing slow rate of growth.

Cumbria LEP	
Occupations with highest forecast growth (2017-2027)	Occupations with lowest forecast growth (2017-2027)
1. Caring personal service occupations	1. Secretarial & related occupations
2. Customer service occupations	2. Process, plant & machine operatives
3. Health & social care associate professionals	3. Textiles, printing & other skilled trades
4. Corporate managers & directors	4. Skilled metal, electrical & electronic trades
5. Business, media & public service professionals	5. Elementary trades & related occupations

Occupation growth forecasts: Despite projections of relatively minimal net employment growth, when replacement demand (through retirement, job movers and other labour market change) is factored in, this translates into over 90,000 potential opportunities, half of them in senior level occupations (associate professional and above). Whilst the pandemic will inevitably reduce this somewhat in the short term, the total requirement for new skills brought by net change and replacement demand is still significant and has major implications for the skills sector in order to ensure residents, both employed and unemployed, are equipped with the skills to take advantage of the opportunities that are presented. This is explored in more detail in the Skills Demand section of Annex B.



Source: Employer Skills Survey, 2019 (published 2020)

Skills that need developing: Among businesses interviewed in 2019 for the national Employer Skills Survey and which anticipated a requirement for new skills in the following year, more than half identified specialist skills/knowledge needed for the role and a similar proportion knowledge of products & services offered by the organisation and adapting to new equipment or materials. Lower down the list came more generic skills such as computer literacy and numerical skills. These are generally in line with the national trends, although Cumbrian respondents were slightly more likely to specify demand for each of the skills mentioned.

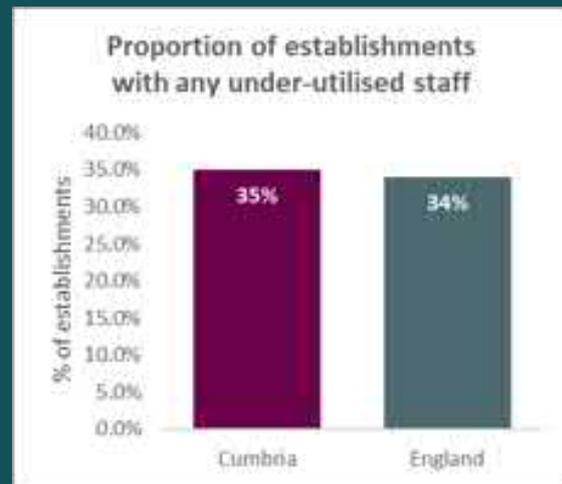
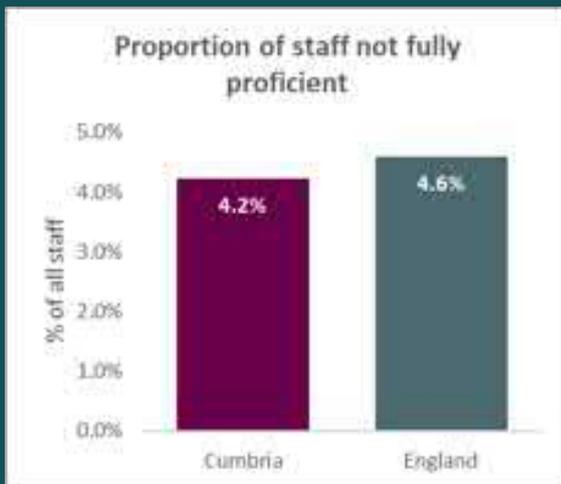
Local survey data from the Cumbria Business Survey (conducted Q4 2020) suggests that a fifth of private sector businesses believed that skills gaps already existed among their workforce. This was more prevalent among “skills active” businesses where a quarter identified current skills needs compared to just 10% of those that aren't skills active (ie undertake training, have a training plan, or have a training budget). In line with the national survey on future demand, it was technical & practical skills specialise to the sector which were most prevalent current need followed by advanced IT/software skills, management skills, problem solving skills, customer handling and basic computer literacy. When probed further, the technical & practical skills related mostly to IT-related skills.

Further details of the Cumbria Business Survey are in Annex B.

MAPPING SKILLS SUPPLY AND DEMAND

Skills Supply and Demand - Summary

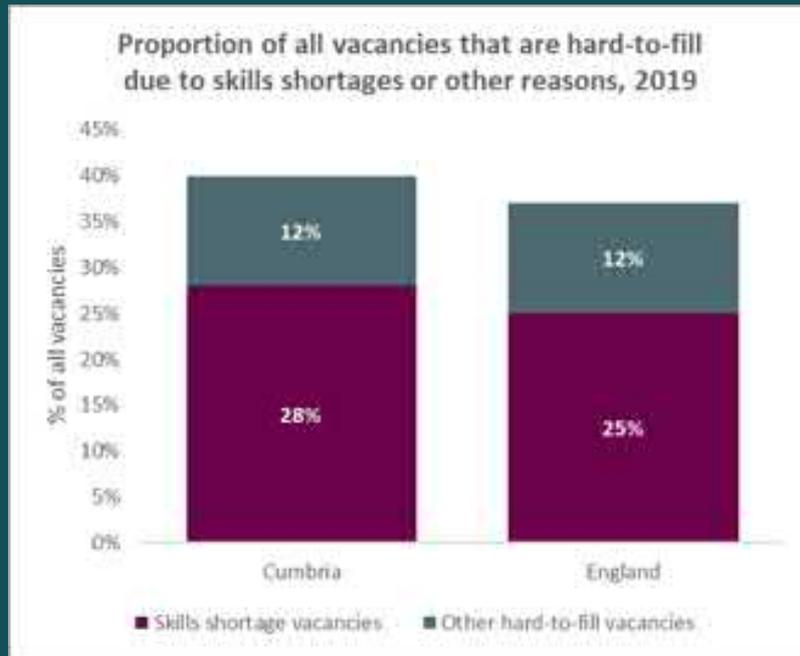
- Cumbria faces a challenging workforce supply issue. There is already a very tight labour market with limited spare capacity and forecasts suggest a severe worsening of overall skills supply relative to need. Much of this is due to demographic change reducing the overall supply of labour rather than directly being an issue of a skills mismatch. As such, the solutions are complex and challenging. In particular there is a need to consider how to:
 - Retain and attract more people of working age;
 - Retain and attract more people with high level skills;
 - Encourage more older residents to enter or stay in the labour markets;
 - Find ways to increase employment rates amongst those out of the labour markets.
- Cumbria has an ageing workforce which is also driving a growing need for replacement demand and ways to upskills the existing workforce.
- The proportion of the workforce with high level qualifications has increased considerably but there is still a significant gap on the national average.
- In absolute terms, there is a relatively thin pool of higher levels skills (measured by qualifications or occupations) and growing demand on this pool which is also spread across the county in what are in effect separate labour markets.
- The evidence suggests there is strong performance in vocational education and training, with a particularly well-functioning apprenticeship system and strong employer engagement.
- The school system performance varies by institution and geography. However, there are some concerns about the performance and progress of disadvantaged pupils at GCSE level.
- Overall unemployment rates are lower than nationally, even since the Covid-19 pandemic, but youth unemployment rates are high in some areas.
- Even with limited anticipated overall employment growth, there will be significant demand from the need to replace existing staff, a factor exacerbated by the ageing profile of the workforce and a declining pool of working age residents.
- Projections suggest a net demand for 90,000 jobs to be filled in the next 10 years whilst estimates suggest only around 3,000 young people will join the workforce each year.
- Demand will be most acute in caring & personal service occupations, sales occupations, managers, and health professionals.
- At least a third of replacement demand jobs are expected to require level 4 or above qualifications which is higher than the current share of such qualifications among the working age population.
- There are significant concentrations of worklessness and low skills in some communities, often ones with large and important employers and growing employment (eg Barrow) – and these disparities have been amplified by the Covid-19 pandemic.
- The prevalence of hard to fill vacancies in Cumbria is above the national average and this is particularly acute in manufacturing and hotels & restaurants, sectors which between them account for more than a quarter of employment.
- A fifth of businesses in Cumbria report that there are skills gaps among their current workforce and many report these are having a major impact on their business. However, these frequently relate to competition for staff with relevant skills and in some cases to a reluctance to invest in training, rather than lack of suitable training being available in the area.



Source: Employer Skills Survey, 2019 (published 2020)

Proficiency of workforce: The national Employer Skills Survey conducted in 2019 suggested that 4.2% of staff in Cumbria were not fully proficient, just below the national average of 4.6% which equates to approximately 10,000 staff. Taken alongside the earlier evidence on skills needs, we can assume that most of this relates to specialist skills/knowledge needed for the role, knowledge of products & services offered by the organisation and adapting to new equipment or materials.

The same survey suggests that around a third of businesses have under-utilised staff, i.e. staff with both qualifications and skills more advanced than required for their current job. This proportion is in line with the national average where it is most prevalent in hotels & restaurants and arts & other services. In some cases this will be out of choice (eg for lifestyle reasons or temporary employment) but in other cases it will arise from a lack of suitable employment and/or career progression opportunities in the local area. This is a particular challenge in a rural county such as Cumbria with dispersed populations, long distances between employment centres and a significant volume of small businesses.



Source: Employer Skills Survey, 2019 (published 2020)

Hard-to-fill and skills shortage vacancies: The national Employer Skills Survey conducted in 2019 suggested that around 15% of businesses in Cumbria had at least one vacancy and that half of these businesses were finding at least one of them hard to fill (similar to national average). Looked at in terms of the number of vacancies (rather than businesses), 40% of vacancies in Cumbria were deemed hard to fill, slightly above the national average, and in two thirds of these the difficulty related to the availability of skills rather than other factors. This suggests that although the issue of hard to fill vacancies might only be affecting a relatively small proportion of businesses, for some it may be having a significant impact on their ability to recruit.

In Cumbria hard to fill vacancies were more likely to occur in middle skill and service-intensive occupations than nationally and less likely to occur in high skill occupations. The main reasons given by businesses for vacancies being hard to fill were there not being enough people interested (higher in Cumbria than nationally), low number of applicants with required skills (lower in Cumbria than nationally) and remote location/poor public transport (significantly higher in Cumbria than nationally).

Additional analysis and references

Local Landscape

Cumbria has the following key sectoral strengths and other assets:

- A major concentration of manufacturing and engineering:
 - Nuclear reprocessing, decommissioning, environmental management, and associated engineering skills with £2 billion pa supply chain spend and national research bodies and university research.
 - Nuclear submarine.
 - Range of advanced manufacturing activity in plastics, rubber, paper, and engineering.
 - Food manufacturing from large multi-nationals to artisan producers.
- Major tourism sector – 47 million visitors to Cumbria support around 8% of GVA and around 38,000 jobs (more when supply chain and multiplier effects are considered). Supports jobs in food and beverages, accommodation, retail, transport, and other sectors.
- Significant land-based industries (agriculture and forestry). Cumbria has major concentrations of sheep, beef and dairy cattle and associated upstream (dairy, feed stuff etc) and downstream (food processing) activity.
- Strategic road and rail location for the North of England and Scotland (M6/A66) and important road transport sector in Carlisle (linked to motorway location).
- Although not a major source of direct employment, there are important energy assets in Cumbria (beyond the nuclear sector):
 - Offshore wind farms (20% of UK capacity)
 - Oil and gas (Morecambe Bay/Irish Sea)
 - Tidal power potential in Solway Firth and Morecambe Bay
 - Biomass and micro hydro.
- Major water assets and supplier of water to North West.
- Other natural assets and associated natural capital and ecosystem services.
- Largest concentration of protected landscapes in UK (Lake District National Park now a World Heritage Site, large part of Yorkshire Dales National Park, Hadrian's Wall WHS, three AONBs).
- Lowest population density of any LEP in England: space to visit and air to breathe.



- University of Cumbria is located in Carlisle and Ambleside (and with smaller campuses in Barrow and Workington); Lancaster University is within 20 miles of south Cumbria; the University of Manchester and UCLAN both have facilities in Cumbria.
- Extensive and successful vocational training sector (FE Colleges and private providers).

Cumbria has the following key challenges and issues:

- Patchy and underperforming levels of productivity with significant productivity gaps on all measures caused largely by the sectoral mix.
- Declining working age population which is projected to continue.
- Thin pool of higher-level skills spread across a large geographical area.
- An innovation 'gap' and weak ecosystem.
- Low rate of business start-ups and enterprise.
- Few faster growing firms: in both absolute and relative terms fewer businesses that grow faster.
- Serious cold spots of worklessness and deprivation including concerning levels of unemployment among young adults in some areas.
- Several areas are heavily dependent on one or two sectors and in some instances one major employer.
- Infrastructure connectivity challenge: issues in connectivity in a physical and digital sense given the needs of our dispersed population, labour force and economy.

SKILLS SUPPLY

The Cumbria Business Survey 2020 was conducted in Q4 of 2020 with a representative sample of 1,700 employing businesses (excluding public sector and not for profits). It was commissioned by Cumbria County Council, Cumbria LEP, all 6 District Councils and Cumbria Chamber of Commerce) and covered a range of topics including trading & investment, business performance & plans, barriers to growth, innovation, digital technology, low carbon, skills, EU and Covid-19 impact. The full report will be published on the Cumbria Observatory website in Spring 2021 (see References for link).

Training & Development

Around half of Cumbria establishments (49% overall) have either a training plan that specifies in advance the level and type of training their employees will need in the coming year in place (42%) or a budget for training expenditure (33%).

Just over half of establishments (56%) had arranged or funded staff training or development for employees at their site. This is a lower proportion than in 2015/16 (61%) and 2013 (62%). Training may have been lower priority in 2020 against the challenges faced during the Covid-19 pandemic and there are likely to have been fewer new starters.

More than half of establishments (54%) plan to provide training in the next year (41% off-the-job training and 48% on-the-job). The most frequently mentioned reason for not planning training is that all staff are fully proficient i.e. there is no need for training (65% of those not planning training). This is more likely to be the case in small establishments where the range of skills required may be narrower.

There is a wide range of other reasons for not planning training, including that the establishment is small (12%); that there is no money for training (8%); COVID-19 issues (7%); it being low priority at present (5%); general uncertainty (3%), and that no training is available in the relevant subject area (2%). Most reasons given reflect circumstances, sometimes constraints, within the business rather than supply issues.

Opportunities for Employment & Work Experience

Overall, around two-thirds of establishments plan or hope to offer work experience opportunities of any description in the next 12 months (63%).

More than a quarter plan or hope to offer apprenticeship opportunities for 16 to 24-year olds (28%), while fewer (18%) plan or hope to offer these opportunities for older people (aged 25 and over).

Almost two-fifth of respondents (38%) reported that their establishment plans to offer employment opportunities for young people.

One in six respondents (18%) reported that their establishment plans to offer other technical education opportunities.

A third of all respondents (33%) reported that their establishment plans to offer higher level skills development for staff.

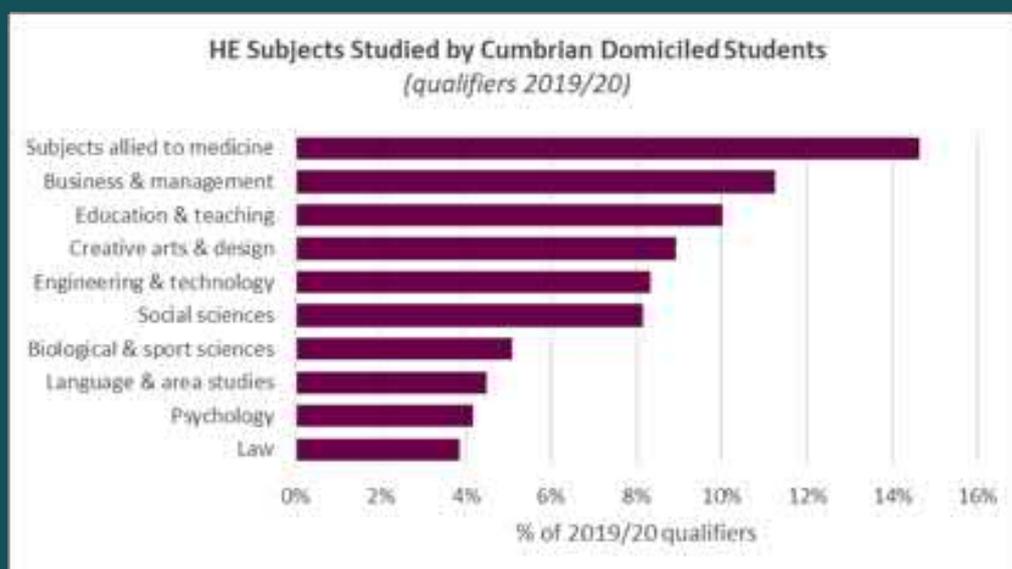
More than a quarter of respondents (28%) reported that their establishment plans to offer work experience/taster opportunities (including virtual formats) and volunteering opportunities are likely to be offered within 18% of establishments.

Higher Education

As noted in Annex A, there are significant limitations to the published data on HE provision and outcomes. This is because data frequently only relates to institutions head quartered in an area and/or does not always disaggregate by campus location. In addition, the published data on geographic destination after learning is very broad. As a result, it is challenging to get a full picture of HE delivery which takes place within the area or is undertaken by residents of the area. In recognition of this, preliminary discussions have taken place with local HE analysts and we intend to convene a group to explore the data in more depth to produce a more robust assessment for Cumbria. This will broadly focus on 3 key strands – students undertaking delivery in Cumbria; students domiciled in Cumbria; students whose destination after learning is Cumbria.

In the interim, we have sourced some additional data on Cumbrian domiciled students which is summarised below and will be explored in more detail as part of the planned analysis project.

Demand for HE from Cumbrian residents



Source: HESA student data

Demand from Cumbrian residents as evidenced by the top 10 subjects studied by the 3,245 Cumbrian domiciled students who qualified in 2019/20 is shown in the above chart. These 10 subjects accounted for 80% of all qualifiers with subjects allied to medicine being the most popular (15%) followed by business & management (11%) and education & teaching (10%). Almost a quarter (23%) of these qualifiers had chosen the University of Cumbria as their provider with the University of Central Lancashire (9%), University of Northumbria at Newcastle (7%), University of Lancaster (4%), Newcastle University (4%) accounting for the rest of the top 5 most popular providers.

SKILLS DEMAND

Cumbria Business Survey 2020

Further data from the Cumbria Business Survey 2020 on skills needs confirmed that skills gaps remain among the Cumbrian workforce and their prevalence may have increased since 2015/16 (although the sample base was different which may explain some of this variance).

Skills Gaps

More than a fifth of respondents (22%) identified skill gaps within their establishment, and this represents a significantly higher proportion than in 2015/16 (14%). Reflecting the number of employees and the scope for skill shortfalls, the propensity to report skill gaps increases with establishment size from 18% where there are fewer than 10 employees to 36% where there are between 25 and 99 employees, to 46% in establishments with 100 or more employees.

In terms of where skill gaps lie, technical and practical skills, or skills specialist to sectors predominate (63% of those reporting skill gaps). Advanced IT or software skills are next most frequently mentioned as skill gaps (42%), followed by management skills (34%). While featuring heavily as skills in which the workforce is lacking, IT/computer-based skills also feature in terms of specific technical or practical skills that are needed (21% of those specifying technical or practical skills).

Employer demand – West Cumbria

Lakes College West Cumbria produced a paper in February 2021 on employer skills demand, particularly considering the impact of the pandemic. This was based on local market intelligence, conversations with employers and conservative mitigating activities expected to take place as lockdown restrictions ease. The College's main areas of provision are STEM subjects, nuclear, constructions, civils, and health & social care, supported by a broader offer which includes arts, computing & business, public services, sport, catering, education, and early years. The college is also an HE provider in engineering, construction, and the sciences.

The full paper is available to members of the People, Employment & Skills Strategy Group (PESSG) for Cumbria but some key skills needs identified by West Cumbrian businesses were:

Nuclear sector - technical skills at level 4-6, civil engineers, civil site manager, quantity surveyor, nuclear specialists, asset & facilities managers, electrical engineers, mechanical & electrical design, control & automation.

Construction – civil engineers, civil site managers, heavy civils & plant, quantity surveyors, scaffolders.

Engineering & manufacturing –management upskilling from level 4-6, support service upskilling, safety, health & environment, technical short courses, lean manufacturing, digital, food manufacturing, quality control, basic & advanced digital skills.

Health & social care –digital, leadership, technical, managerial.

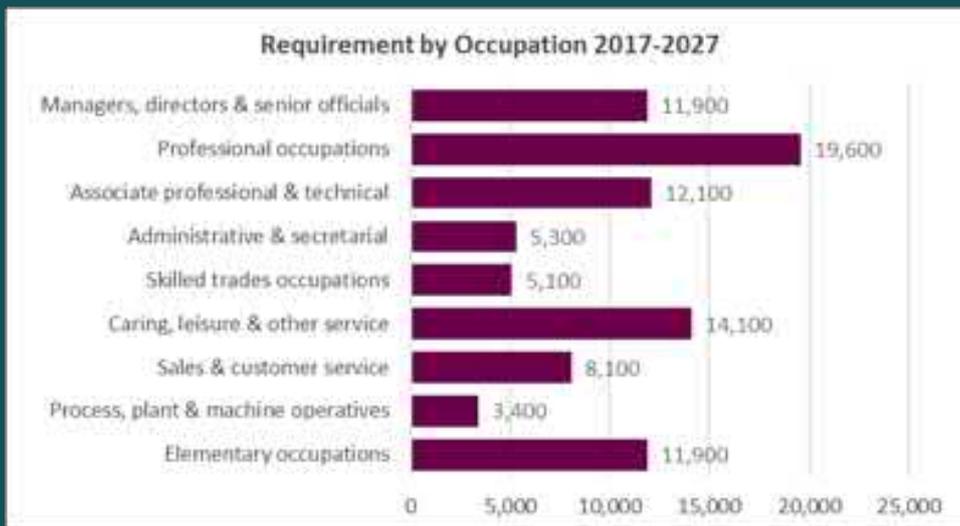
Digital –baseline digital, machining & manufacturing technology, computer aided design, digital marketing, IT professionals.

Business support – quality, marketing, social media, website development, higher management.

Future Occupation Demand

As outlined in the Skills Demand section of Annex A, economic projections suggest minimal net employment growth in Cumbria over the next 10 years. However, expansion demand is only one element of demand and significant opportunities will be available through other factors such as retirement, leavers from the workforce for other reasons, job movements etc. The Working Futures projections calculate this in addition to net growth by factoring in demographic data on occupations by age and relationships between occupations. Furthermore, they assign skill levels to occupations to assess how expansion and replacement demand might influence future skill level requirements.

This analysis suggests that there could be over 90,000 opportunities created between 2017 and 2027, mostly through retirement demand. Much of this will be in senior occupations but there is also substantial demand for caring, leisure & other services and in elementary occupations. Aligned to this the analysis also suggests substantial demand for higher level qualifications with two thirds of opportunities requiring a first degree or higher and alongside this, reducing demand for opportunities with low or no qualifications.



Source: Working Futures, 2017-2027 (published 2020), 2017 LEP boundaries



Source: Working Futures, 2017-2027 (published 2020), 2017 LEP boundaries

References / Links

Document / Data Source	Link
Cumbria LEP Skills Evidence Base 2019	Skills evidence base
Cumbria LEP Local Industrial Strategy Evidence Base 2019	Cumbria LIS evidence base
Cumbria LEP Local Industrial Strategy 2019	Cumbria LIS
Cumbria Intelligence Observatory (monthly labour market briefings)	Labour Market Briefings
Cumbria Intelligence Observatory (home page)	Cumbria Intelligence Observatory
Labour Insight job postings (available via subscription)	Active Informatics
Banksearch Start-Up data (available via subscription)	Banksearch Consultancy Ltd

LOCAL SKILLS REPORT 2021

Document 2

This is document 2 referred to in the Appendix marked WCM/MAK/4 on the Rebuttal Proof of Evidence of Mark Kirkbride dated 31.08.2021 on behalf of West Cumbria Mining Ltd

Carbon lock-in from fossil fuel supply infrastructure

Introduction

A transition to a low-carbon economy is essential to ensuring a safer climate, but it will not be easy. Despite the well-documented benefits of decarbonizing energy systems,¹ the declining costs of renewable energy and high-efficiency technologies, and the promise of further innovations, the world continues to rely heavily on an abundant and growing supply of fossil fuels.²

This discussion brief focuses on a key concern with ongoing investments in fossil fuel supply and the technologies that use these fuels: “carbon lock-in”.³ The essence of carbon lock-in is that, once certain carbon-intensive investments are made, and development pathways are chosen, fossil fuel dependence and associated carbon emissions can become “locked in”, making it more difficult to move to lower-carbon pathways and thus reduce climate risks.

For example, near-term investments in coal-fired power plants, with their low operating costs, long technical lifespans, and strong institutional and political support, increase the future costs of achieving a given emissions target.⁴ So, too, might natural gas power plants, fossil-fuelled vehicles, and inefficient buildings and heating technologies.⁵ Overall, the International Energy Agency (IEA) has found, if energy investments favour high-carbon technologies through 2020 instead of low-carbon alternatives, the medium-term investment (through 2035) needed to reach low-carbon objectives would increase fourfold.⁶

Here we propose a two-step approach to gauging the relative lock-in risks of investments in fossil fuel exploration and extraction:

- First, we identify investments in fossil fuel resources and infrastructure that are likely to be inconsistent with climate protection objectives, as reflected in a metric of

“over-produced” fossil fuels that captures the *scale* of lock-in effects.

- Second, we evaluate the *strength* of this lock-in – i.e. the extent that, once such investments are made, they may be difficult to move away from, or “unlock” in the future. We assess the strength of lock-in by two metrics: the relative amount of capital invested in these over-produced resources, and the relative amount of economic “rents”, or profits, likely to accrue from them.

Together, these analytical steps and metrics can help policy-makers identify the fossil fuel deposits for which new investments are most likely to lead to carbon lock-in. Below we apply this approach at the global scale, to illustrate the methodology and to provide general insights on the broad categories of resources that may pose the greatest lock-in risk. With sufficient data and scenarios, this approach can be applied at various geographic scales. We also discuss equity issues that might arise in using the results to plan for a low-carbon future.

While this approach can be applied to any time frame, we focus here on the year 2030, which is the target year of current negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). Moreover, fossil fuel production capacity and costs in 2030 will be heavily influenced by the choices made by policy-makers within the next few years, and the investments they encourage or deter.

Policy-makers are already showing a growing interest in the greenhouse gas emissions implications of fossil fuel supply,⁷ and a small but growing body of research suggests that efforts to limit fossil fuel extraction could complement and increase the effectiveness of demand-side approaches to climate policy.⁸ Research such as ours can inform efforts to integrate supply- and demand-side approaches.



An open-cut coal mine in the Upper Hunter Valley, New South Wales, Australia. Most of the coal produced here is exported to Asia.

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Step 1: Assessing the scale of fossil fuel (carbon) over-production

Policy-makers (and investors) may have many reasons for assessing carbon lock-in risks associated with fossil fuel supply. They may want to ensure that their economies are competitive in a low-carbon future.⁹ They may wish to limit the risk that low fuel prices or climate policies require the premature retirement of investments – i.e. “stranded assets”.¹⁰ They may also be concerned about “carbon entanglement”, the process by which governments become so dependent on rents from fossil fuel production that they resist efforts to limit it.¹¹ Or they may simply want to understand how fossil fuel supply infrastructure decisions might affect their ability to achieve climate protection goals.

Whatever its motivation, such an assessment must be grounded in an understanding of fossil fuel resources¹² and future plans for their development. Accordingly, the first step of our approach is to assess existing and planned fossil fuel supply under both business-as-usual (BAU) and low-carbon scenarios. Comparing the two scenarios provides an estimate of fossil fuel **over-production** – production that appears to be inconsistent with a low-carbon pathway.

Investments associated with this over-production could be at risk of stranding if climate policies or low prices reduce demand for fossil fuels. Or over-investment could lead to carbon lock-in instead, if the investments deter climate action, making it likelier that fuel production and, by extension, consumption will continue at levels incompatible with a low-carbon pathway. In other words, capital investment in resources not needed under a low-carbon pathway not only creates the risk of asset stranding under future, more ambitious climate policies, but it may put that very ambition at risk.

The concept of over-produced fossil fuel resources (or carbon) is related to the notion of *unburnable carbon*: both refer to resources that would not be extracted under a low-carbon pathway. The key difference is that unburnable carbon typically reflects *all* resources and/or reserves that must be left in the ground,¹³ whereas over-produced carbon reflects only the resources that would likely be extracted and consumed in a BAU scenario, but not in the low-carbon one.

To assess fossil fuel over-production, we rely on two scenarios in the IEA’s *World Energy Outlook 2014: New Policies*, a BAU scenario that reflects countries’ stated climate ambitions, including broad policy commitments and plans that have yet to be implemented, and the 450 Scenario; they correspond roughly to a 4°C and a 2°C warming path, respectively.¹⁴ For simplicity, we consider only steam coal production and markets. Demand for coking coal does not vary significantly from BAU levels in many low-carbon scenarios, so it is unclear whether coking coal investments involve significant lock-in risks.

Under BAU in 2030, fossil fuel producers extract 5.0 billion tonnes of steam coal equivalent (tce), 37.0 billion barrels of oil supply (101.3 million barrels per day, or bpd), and 4.6 trillion cubic metres of gas. This level of production corresponds to, once combusted, 13 billion tonnes (Gt) CO₂ from steam coal, 14 Gt CO₂ from oil, and 9 Gt CO₂ from gas, after correcting for fuels not expected to be combusted, e.g. due to use as industrial feedstocks. In comparison, resource

production in the low-carbon scenario is 65%, 85%, and 90% of BAU levels for steam coal, oil, and gas, respectively. Over-production in the BAU scenario is therefore 4 Gt CO₂ for steam coal, 2 Gt CO₂ for oil, and 1 Gt CO₂ for gas.

These estimates of over-production reflect the relative *scale* of carbon lock-in by fuel type, and thus the extent to which extraction, and corresponding upfront investment, might need to be scaled back to achieve a given climate protection objective. Unsurprisingly, coal is the fossil fuel on a path to be most over-produced, but the levels of over-produced oil and gas are significant as well. Understanding which types of coal, oil, and gas deposits are likeliest to be resistant to climate policy and prone to carbon lock-in requires further economic analysis. This is the second step of our approach.

Step 2: Assessing the strength of carbon lock-in

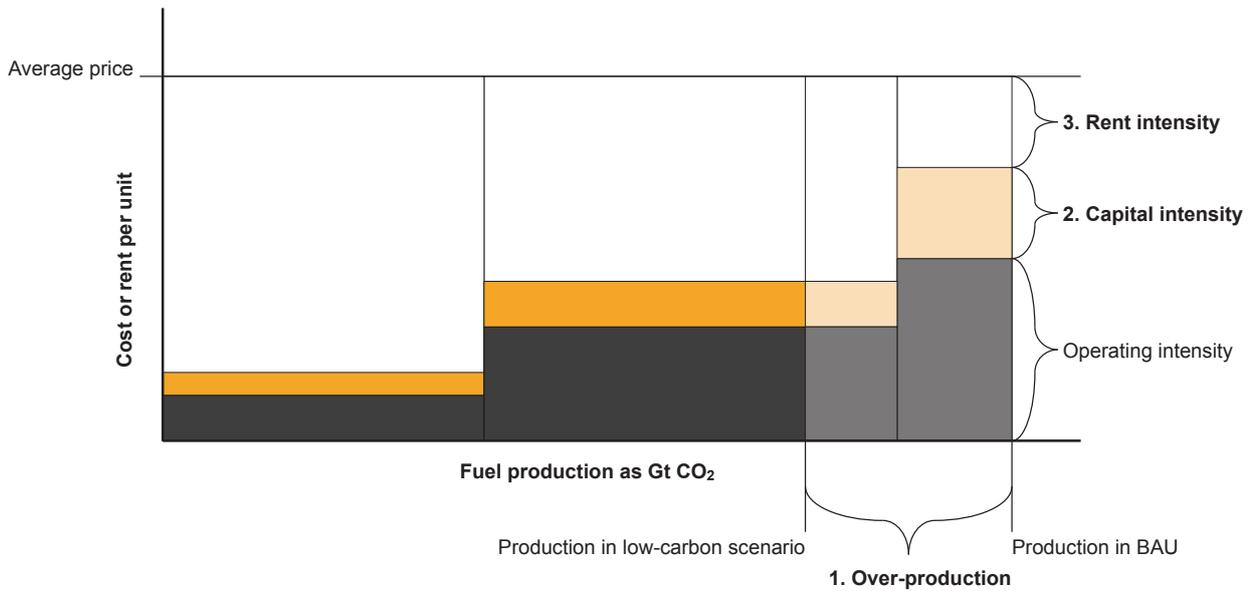
Now we look to the economics of different resources, focusing on two metrics – capital intensity and rent intensity – to illuminate which types of investments would be most difficult to “unlock” – or least likely to be stranded due to changing economics or climate policy.

Capital intensity (\$/t CO₂) represents the level of capital investment required to extract a given unit of a particular resource – for example, the cost of building an oil platform relative to the amount of oil to be extracted. Once these investments are in place, the marginal cost of production drops to the operating costs (plus any ongoing capital cost). Thus, in our example, even if the cost of the platform brought the total cost of the oil to 50 USD per barrel, if operating costs are only 20 USD per barrel, a rational investor might continue to produce even if the price of oil dropped below 50 USD. The more capital-intensive an investment, the more it may be insulated from price fluctuations once operational. In fact, all else being equal, operators may be likelier to continue operations of more capital-intensive resources, perhaps even after it stops being economically rational.¹⁵ As a result, we suggest that the greater the capital intensity of a fossil fuel resource, the likelier it is that, once established, it will be extracted, even under unfavourable economic conditions.

We assess capital intensity as costs (in 2015 USD) for equipment and infrastructure for exploration, development (e.g. facility and well expenses), and maintenance and modification of resources to each market. For oil and gas, we use data from Rystad Energy;¹⁶ for coal, we use Leaton et al. (2014)’s assessment of Wood Mackenzie data.¹⁷ Both Rystad Energy and Wood Mackenzie are also used by the IEA in its *World Energy Outlook*, so the cost data used here are likely to be relatively consistent with the assumptions underlying the BAU and low-carbon IEA scenarios used here.

Rent intensity (\$/t CO₂) reflects how profitable each unit of a resource is likely to be. It is thus a key indicator of the economic incentive that owners have to keep producing, once capital has been invested. Here we express the metric as total rent (revenue minus production cost) divided by the carbon content of the fuel (i.e. CO₂ emitted upon combustion). From this we can extrapolate the carbon price at which further production of a resource might be rendered uneconomic. This metric is also a good indicator of carbon “entanglement” risks: how much money a government that relies on fossil fuel rents might stand to lose if it pursues policies

Figure 1. Illustrative schematic of fossil fuel production cost curves



to limit fossil fuel production.¹⁸ Furthermore, economic rents can serve as a proxy for the relative political power of private-sector entities that benefit from production of a given resource.¹⁹

We estimate average rent intensities for oil and gas resources as the difference between total production costs and weighted-average global prices in 2030 of 104 USD per barrel of oil and 8 USD per million Btu (MBtu) of gas.²⁰ Coal prices in domestic markets can vary substantially, though they are generally lower than seaborne, or import, prices. Therefore we make a simplifying assumption that domestic prices for coal average about 70 USD per tonne, and import prices average about 85 USD per tonne, based on a review of IEA and Leaton et al. (2014)’s assessment of Wood Mackenzie.²¹ Again, as local market prices vary, especially for coal and natural gas, actual rents may vary considerably from the averages estimated here.

Results: visualizing over-production and resource lock-in

We present the results of our analysis in three figures: one each for coal, oil and gas. All use a cost curve of production by category of resource in 2030 to illustrate three metrics:

- **Over-produced resources:** the resources in lighter shading (toward the right of each curve) that would be produced under business as usual (here, the IEA New Policies Scenario) and not in a low-carbon scenario (here, the IEA 450 Scenario).
- **Capital intensity:** the average investment needed to produce each category of resource, displayed as the top (red, green, or blue) portion of each bar.
- **Rent intensity:** the difference between the total (capital and operating) cost of each category of resource and the average price per unit produced or emitted, which decreases from left to right as production costs rise.

Figure 1 above provides a guide for reading the cost curves, each of which contains many more “blocks”, or resources,

on the following pages. The x-axis represents production of each resource type, while the y-axis shows the cost of producing each unit of that resource type. Since our analysis is concerned with carbon lock-in, we present resource production in terms of Gt CO₂ emitted once that resource is combusted (after accounting for non-combustion uses).

The full-coloured blocks at left represent fossil fuel production that would occur even in a low-carbon scenario. The lighter blocks at right (1) represent over-production; we assume for simplicity’s sake that higher-cost resources would be the ones not produced. The black and grey blocks represent operating costs. The orange blocks (2) represent capital intensity – which, as noted earlier, increases the likelihood that a resource will be produced, once investment is made, even at low market prices.

Instead of orange here, the charts in Figures 2–4 use dark and light red (coal), green (oil), and blue (gas) to represent capital investment. Rent intensity (3) is expressed as a block of white space between the coloured blocks and the line for the average price.

Key findings

Not surprisingly, of the three fossil fuels, it is coal for which production would need to be scaled back the most in a low-carbon scenario, both as a share of production (34%) and in absolute carbon terms (about 5 Gt CO₂). At the same time, the analysis indicates that investments in coal production may also be the easiest to “unlock”. As indicated by the areas of the coloured (red, green and blue) bars and light grey bars, coal resources are far less capital-intensive (less than 5 USD/t CO₂) than oil or gas, for which new fields require investments of 30 USD/t CO₂ or more. This indicates that sunk costs for infrastructure, and creditor concerns, may contribute less to lock-in for coal.

Coal is also far less rent-intensive on average, with most deposits yielding rents of less than 10 USD/t CO₂, while rents to oil and gas production average 50 USD/t CO₂ or more. This suggests that carbon pricing – or normal fluctuations in resource prices – could have a greater effect on coal than

on oil or gas production. With combined capital and production costs that are far closer to expected prices than those for oil and gas, coal mines are at far greater risk of being rendered uneconomic by carbon pricing. Thus, at least based on economic considerations, investments in coal production may create less “lock-in” risk than investments in oil or gas production.

Of course, social and political considerations – as well as local differences in project economics, including rents – might change the outlook. For example, other research has suggested that coal production is more labour-intensive than oil or gas, and that coal production interests have already been among the most powerful opponents of climate policies

in both the U.S. and the EU. Furthermore, coal-fired power production (the demand side of coal markets) still presents a significant lock-in risk.²² That said, planners concerned about carbon lock-in risks from fossil fuel supply investments may want to look at oil and gas before coal.

Oil is both the most capital-intensive and most rent-intensive fossil fuel, with average capital intensity of 44 USD/t CO₂ (16 USD/bbl) and rent intensity of 200 USD/t CO₂ (74 USD/bbl), when assessed across all barrels produced. This high rent intensity suggests that, for many oil deposits, carbon pricing would be less likely to affect production as substantially. The capital intensity of oil production ranges from 4 to 41 USD per barrel (11 to 112 USD/t CO₂), with

Figure 2. Coal production in 2030 in the BAU and low-carbon scenario, including over-production

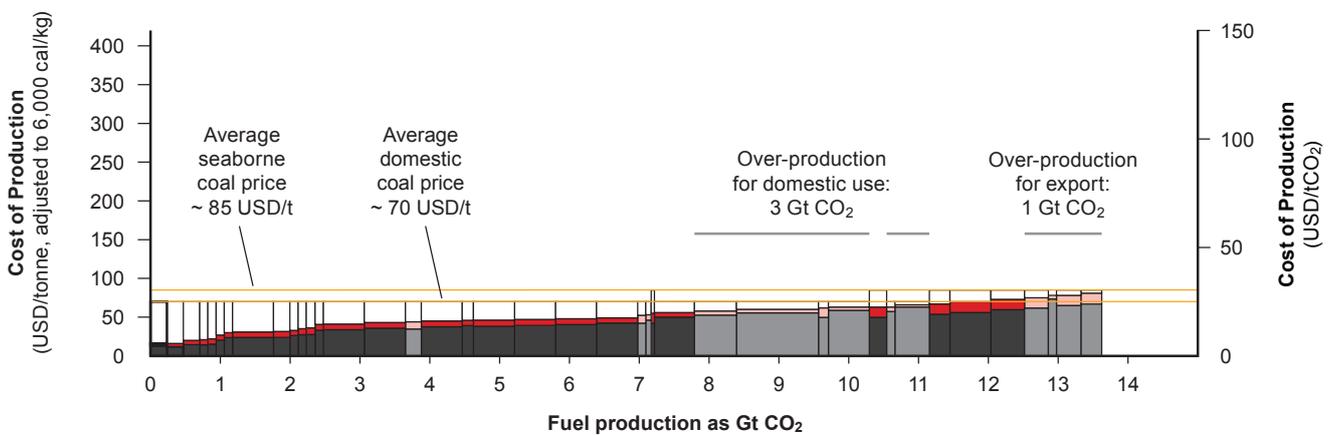


Figure 3. Oil production in 2030 in the BAU and low-carbon scenario, including over-production

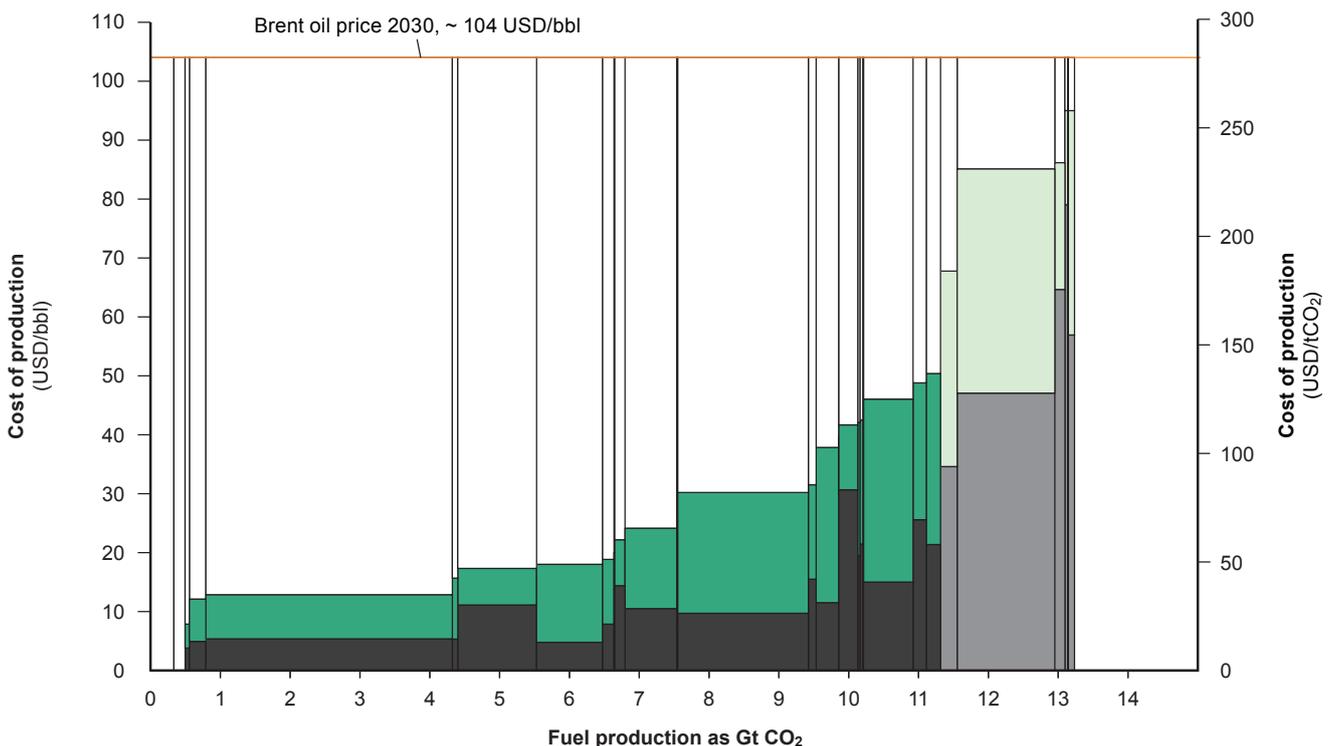
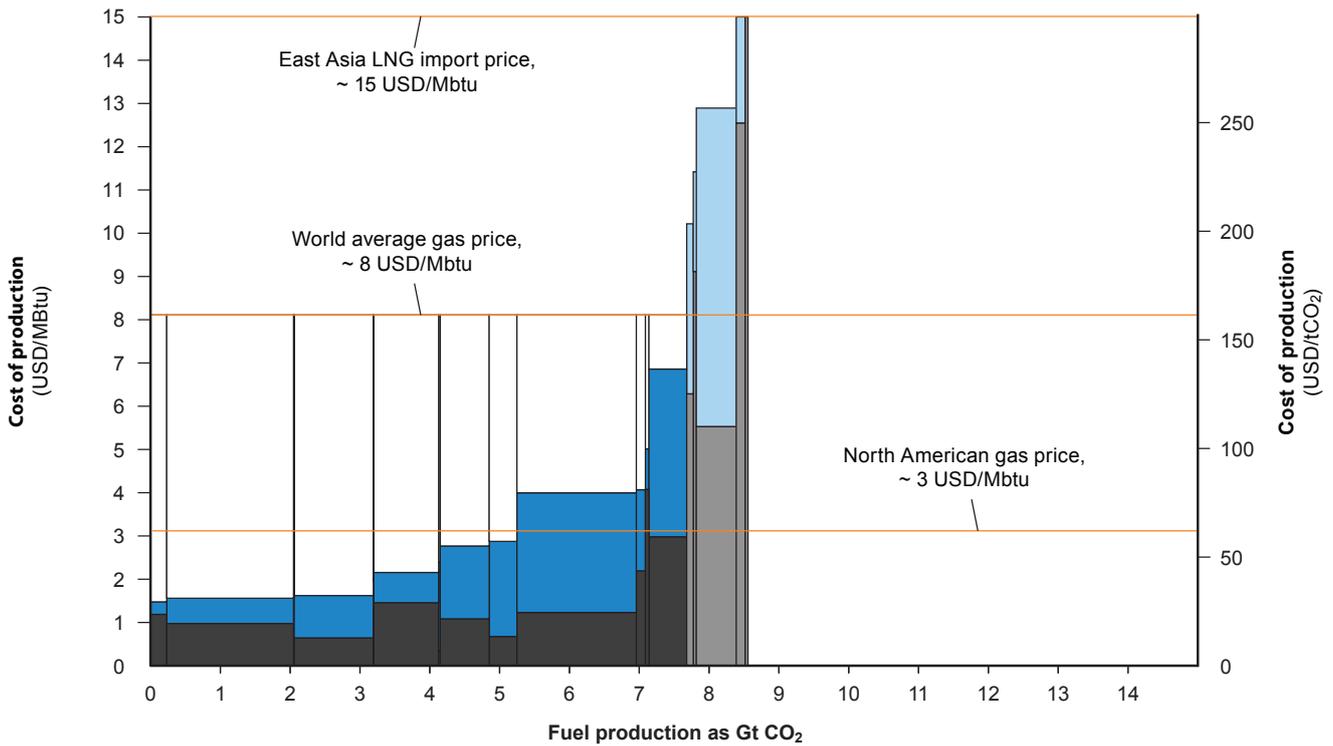


Figure 4. Gas production in 2030 in the BAU and low-carbon scenario, including over-production



significant investment required especially for higher-cost (currently not producing) offshore resources unlikely to be developed in a cost-efficient low-carbon scenario. Near-term investment in these resources could be substantial, creating momentum for future over-production.

For the barrels over-produced in 2030, our analysis shows a capital intensity of 97 USD/t CO₂ and rent intensity of 55 USD/t CO₂ – or 153 USD/t CO₂ combined (see Table 1), suggesting that those resources would be well-insulated from future price fluctuations or carbon pricing, once capital is invested. Overall, our analysis suggests that among investments in fossil fuels, those in oil production, especially in higher-cost, yet-to-produce resources, are most likely to increase carbon lock-in.

Looking deeper at offshore oil, our analysis indicates that production from yet-to-be made investments in this infrastructure would need be cut by half in 2030 in the IEA’s 450 Scenario, relative to BAU. The Americas (North and

South) represent the greatest source of over-production (nearly half). Capital investments such as these may deserve special scrutiny because, once oil platforms and other major fuel extraction infrastructure are in place, the marginal cost of producing each unit of resource drops to 50 USD/barrel or less (the operating cost – i.e. the black or grey portion of each bar in Figures 2–4). This insulates the resource from likely expected variations in fuel price, whether due to climate policy or normal market fluctuations.

Rent intensities for natural gas production can also be substantial (averaging 93 USD/t CO₂ or 5 USD/MBtu), though large variations in regional gas prices complicate the assessment of rents for gas, and the average values indicated in Figure 4 may not apply for regions where natural gas prices are very low (e.g. North America, with prices as low as 3 USD/MBtu) or very high (e.g. liquefied natural gas in East Asia, with prices as high as 15 USD/MBtu, as indicated in Figure 4). As with oil, yet-to-produce offshore gas resources

Table 1. Carbon lock-in assessment of over-produced fossil fuel resources

Resource Group	Fossil fuel over-production, 2030 (Gt CO ₂ annually)	Production in low-carbon scenario relative to BAU in 2030	Average capital intensity (USD/t CO ₂ over-produced)	Average rent intensity (USD/t CO ₂ over-produced)	Capital + rent intensity
Coal	4.6	-34%	3	*	*
Of which, seaborne	1.0	-37%	5	\$3	8
Oil	1.9	-14%	97	\$55	153
Of which, offshore and not yet producing	1.4	-50%	104	\$52	155
Gas	0.9	-10%	119	*	*
Of which, offshore and not yet producing	0.6	-27%	144	*	*

*We do not report average rent intensities for natural gas or for domestic coal, since unlike for oil and seaborne coal, there are wide variations in prices by region.

are the most capital-intensive, with over-produced resources averaging 144 USD/t CO₂ (7.4 USD/MBtu). They also are set to over-produce by the greatest quantity: 0.6 Gt CO₂ in 2030.

These findings depend on the year chosen (here, 2030) and the scenarios used (here, the IEA's New Policies and 450 scenarios). Thus, our analysis is just one possible outcome of such an exercise. Low-carbon scenarios that foresee greater reduction in oil consumption, for example, might suggest the need to further scale back capital-intensive oil investments. Indeed, lower oil price scenarios in Rystad Energy's assessment may foreshadow what might occur under even deeper low-carbon scenarios, as they also lead to a substantial scale-back of capital investment in onshore tight oil production, especially from not yet producing assets.²³

Similarly, if an analysis year well beyond 2030 were chosen, some low-carbon scenarios might foresee significant availability of carbon capture and storage (CCS) facilities, thereby enabling higher levels of coal production, and thus less over-production relative to BAU. That said, our assessment of over-production of coal, oil, and gas in a 2030 time frame is broadly consistent with a recent meta-analysis of fossil fuel production in a low-carbon economy.²⁴

Policy implications and conclusions

This paper presents a generalized approach for assessing carbon lock-in risk from investments in fossil fuel extraction, building on common approaches to energy scenario analysis and fossil fuel resource analysis. Using this approach and its three metrics – *over-production*, *capital intensity* and *rent intensity* – policy-makers can assess the consistency of plans for developing new fossil fuel resources, or infrastructure to support them, with climate protection objectives.

Our application of this approach at the global scale suggests that rents for coal extraction are low enough that, in principle, scaling down coal extraction may be within reach of climate policy – e.g. through carbon pricing at the point of extraction or through financial incentives.²⁵ Indeed, others have proposed policy mechanisms, such as supply-side cap-and-trade, designed to transition away from coal.²⁶

In contrast, oil extraction is relatively profitable and, in many cases, capital-intensive. This suggests that strong financial interests may pose substantial barriers and tend to keep capital-intensive oil resources in production, even if later

policy efforts (including carbon pricing) were to call for a transition away from oil.

The capital-intensive nature of new, unconventional and offshore oil developments, as identified here, suggests that near-term investments may bring resources online that will be especially difficult to unlock. Furthermore, some researchers have suggested that resource owners may deliberately speed up investment and production in the near term, while carbon prices are low or non-existent, so they can lock in and insulate resources against the loss of rents due to the eventuality of steeply increasing carbon prices.²⁷ Policy-makers concerned about carbon lock-in risks, but also eager to ensure that near-term energy needs are met, may want to try to steer investment towards less capital-intensive oil reserves.

More broadly, our analysis highlights the importance of identifying the potential for fossil fuel “over-production” and the capital and rent intensities associated with those resources. Policy-makers could then tailor policy measures to fit the capital and rent intensity of each type of resource. Where rent intensity is low, financial measures (such as carbon pricing and subsidy reform) may be particularly effective. For resources that are both rent- and capital-intensive, non-financial measures, such as quotas or limits on extraction (implemented through permitting decisions, for example), might be more effective. Further research is needed to better understand which approaches are most effective, and how they might be combined.

Of course, carbon lock-in risk is just one of many factors that policy-makers may consider in regulating the development of fossil fuel resources. Countries with substantial fossil fuel resources may have only a small subset of the high-risk resources assessed here. Or they may already be deeply “entangled”, heavily dependent on fossil fuel extraction – or be counting on it for their future energy supply and economic development.

Applying this approach at the regional or national level is likely to raise questions about accounting and equity that policy-makers have yet to resolve. For example, some countries extract (and generate rents from) fossil fuels that are exported to other jurisdictions, where they release CO₂ emissions that are not generally attributed to the countries of origin.²⁸ By limiting extraction, such countries would forgo economic rents without getting “credit” for any emissions avoided. (Global CO₂ emissions would be avoided to the extent that the forgone production was not matched by production increases in other countries.)

The importance of fossil fuel extraction to some lower-income countries' development should also be carefully considered. Their policy-makers may rightfully note that many other countries have based economic development on fossil fuel energy. Thus, the application of this analytical approach at the regional and national scales would need to consider this concern, as well as possible relationships between the location (and forgone rents) of fossil fuels left in the ground and the financial responsibility for climate change mitigation.

Other researchers have suggested that policies to limit fossil fuel supply, such as supply-side caps, can increase the efficiency and effectiveness of demand-side measures to reduce



Close-up of a surface coal mine in Gillette, Wyoming.

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A shale gas well in Pennsylvania, one of thousands developed in the state as part of the Marcellus Shale hydraulic fracturing boom.

CO₂ emissions as well.²⁹ Additional research is needed to clarify how supply-side policies can complement demand-side policies. This framework can contribute to that research by helping to shed light on the types of fossil fuel resource investments likeliest to create carbon “lock-in”, and thus help policy-makers to develop well-targeted and effective supply-side climate strategies.

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For a quick overview of the scenarios, see: <http://www.iea.org/publications/scenariosandprojections/>. Note that the IEA also has a Current Policies Scenario that is a more classic BAU, assuming no changes from existing policies.

In line with the concept of carbon lock-in, we focus solely on CO₂ emissions from fossil fuel combustion, though we must note that other GHGs, notably methane, are released in the course of extracting and processing fossil fuels. Such emissions can often be reduced through cost-effective improvements in extraction and processing operations, however, and may thus be less “locked-in”.

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© Flickr / Maersk Drilling

The Maersk Intrepid, the first of four jack-up rigs built for 'ultra-harsh' environments, at the Keppel FELS shipyard in Singapore, before being mobilized to drill wells on the Martin Linge field development in the Norwegian North Sea.

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Document 3

This is document 3 referred to in the Appendix marked WCM/MAK/4 on the Rebuttal Proof of Evidence of Mark Kirkbride dated 31.08.2021 on behalf of West Cumbria Mining Ltd



European
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BRUSSELS, 5.5.2021
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COMMISSION STAFF WORKING DOCUMENT

Towards competitive and clean European steel

Accompanying the

**Communication from the Commission to the
European Parliament, the Council, the European
Economic and Social Committee and the
Committee of the Regions**

**Updating the 2020 New Industrial Strategy:
Building a stronger Single Market for Europe's
recovery**

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*Internal market,
Industry,
Entrepreneurship
and SMEs*



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1. Introduction

Steel is a vital material for a modern, industrialised economy. Modern buildings, cars, ships, tools, industrial machinery and household appliances would not be imaginable without its unique and diverse properties. Steel is a vital component in most of the EU's industrial ecosystems. It is estimated that, for every person in the EU, there are currently about 12 tonnes of steel in use.¹

The European steel industry has a long history and is a leader in innovation, quality and environmental performance. However, the sector has been struggling in recent years – with stagnating demand, international trade distortions and a pandemic that has disrupted supply chains and impacted downstream sectors. At the same time, the European steel industry is expected to invest in research and development, rethink its production processes and deliver substantial emission reductions in order to stay competitive and contribute to climate neutrality by 2050. This combination makes for an exceptionally challenging business environment and illustrates many of the challenges that EU industry at large faces.

The Commission's New Industrial Strategy for Europe, adopted a year ago, sees industry at the heart of the twin green and digital transition driving change in the European economy.² For this to happen, Europe needs a deeper and more digital single market, greater resilience and open strategic autonomy in line with the recently adopted Commission Trade Policy Review.³ The Industrial Strategy recognised that energy-intensive industries are indispensable to Europe's economy and that other sectors rely on them. It announced that the Commission would support clean steel breakthrough technologies leading to a zero-carbon steel making process and recalled the importance of creating new markets for climate-neutral and circular products such as steel, cement and basic chemicals.

The steel sector and other energy-intensive industries play a vital role in providing products and services to a wide-range of Europe's industrial ecosystems, which are assessed in the accompanying staff working document on the single market economy report, and its annex presenting the 14 industrial ecosystem fiches⁴. The steel sector and other energy-intensive industries also face common challenges to achieve their twin transition and resilience objectives.

Steel is capable of being one of the first hard-to-abate sectors to produce green products, and to do so first in Europe, provided that the right framing conditions are in place. However, this is a race against time. 2050 is just one investment cycle away for a sector like steel, which has long-lasting capital assets. The next five years will be crucial for seeing which part of the world is fastest to develop clean breakthrough technologies and processes to make steel.

The steel sector is an important voice in the High-Level Group on Energy-Intensive Industries, which in 2019 developed its masterplan on how steel and other energy-intensive industries could reach climate-neutrality and circularity by 2050.⁵

This staff working document shows which policies and tools the EU has at its disposal or in the pipeline to help the steel industry in its transformation – from research funding, through regulatory measures to trade instruments.

¹ Material Economics (2019): Industrial Transformation 2050.

² COM(2020)102 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0102>

³ COM(2021) 66 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021DC0066&from=ES>

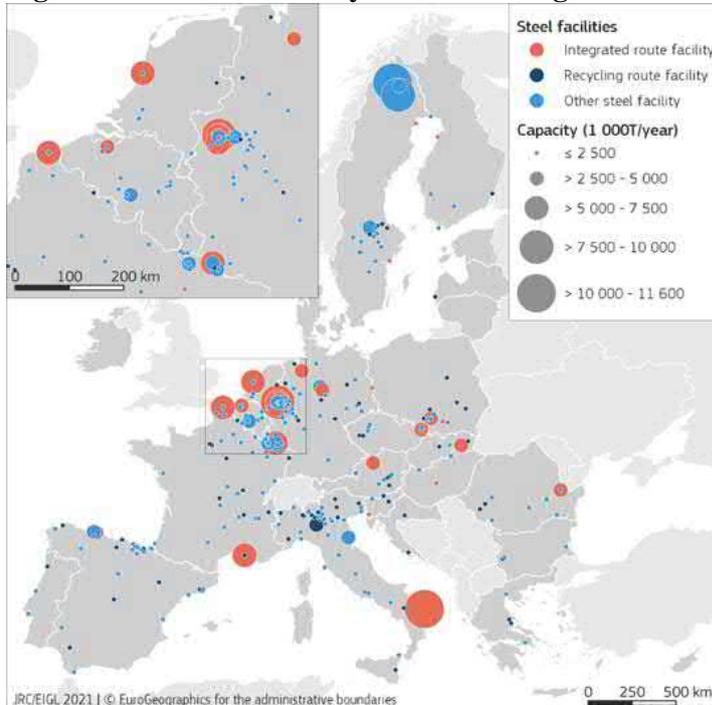
⁴ SWD(2021)351, Annual Single Market Report 2021, Annex III

⁵ <https://op.europa.eu/en/publication-detail/-/publication/be308ba7-14da-11ea-8c1f-01aa75ed71a1>

2. The steel industry in Europe and globally

The European steel industry has more than 500 production sites operating across 23 EU Member States. The industry directly employs 330,000 people, and when including indirect and induced jobs in other sectors, creates 2.6 million jobs throughout the EU.⁶

Figure 1: EU Steel industry manufacturing facilities



Source: JRC (data from Plantfacts)

In 2019, total global steel production was 1.9 billion tonnes. The EU was the second biggest steel producer in the world, accounting for around 150 million tonnes of production, after China, whose production currently represents around 53% of global production (1 billion tonnes).⁷

The EU currently imports around 41 million tonnes of steel annually, mainly from non-EU European countries, CIS and Asian countries, or 26% of its consumption. It exports 30 million tonnes, or 18% of its production, mainly to non-EU European countries and North America.⁸ In value terms, the trade balance of the iron and steel sector is positive, at EUR 1.1 billion in 2019.⁹

Steel is a crucial input to several downstream ecosystems, such as construction, mobility and automotive, or for mechanical engineering companies. Data on steel consumption per sector shows that construction account for 35% steel use in the EU, automotive for 19%, mechanical engineering and metal ware by 15% each and tubes for 10%¹⁰. Companies active in these sectors, many of which are small and medium-sized enterprises (SMEs), employ millions of workers in Europe and depend on EU steel production. These European businesses rely on

⁶ EUROFER, European Steel in Figures 2020.

⁷ World Steel Association, Steel Statistical Yearbook 2020.

⁸ World Steel Association, Steel Statistical Yearbook 2020.

⁹ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_goods_by_type_of_good

¹⁰ EUROFER, European Steel in Figures 2020.

having access to steel products at competitive prices in order to be able to compete, even globally.

Two main steelmaking processes are currently used in the EU:

- 60% of steel is made via the integrated route, which produces virgin steel from iron ore. Iron, in the form of sinter or pellets, is reduced in the presence of coke in a blast furnace (BF), and then converted into crude steel in a basic oxygen furnace (BOF).
- 40% of steel is made through the recycling route, where scrap steel is reprocessed in an electric arc furnace (EAF).¹¹

Steel is not a homogenous product and different types of steel can be distinguished based on chemical composition (carbon, stainless, electrical and specialty steel), physical form (flat and long steel), transformation stage (hot rolled, cold rolled, galvanised steel), as well as quality differentiation (high-end/advanced quality steel products vs basic grades steel).

European steel demand is differentiated, with different demand patterns and prices across European regions. Such differences come on top of what can be observed at the global level, where prices, trade flows and demand patterns vary greatly. Some steel producers act as opportunistic players, shifting their supplies across the world for price arbitrage. The level of imports is not homogeneous across Europe, as imported steel is mainly steel of lower quality and basic grades, which does not meet the criteria of certain users that need more specialised steel, such as the automotive industry.

Whilst the EU steel industry operates in a global context, the markets for different steel products are regional (EEA-wide) or possibly sub-regional in scope. Market structures largely differ across different geographic regions and sourcing occurs to a very large extent at a regional level. Importantly, the pricing of steel products can be significantly differentiated across different geographic areas around the world as prices are not only affected by global development in raw material and global demand/supply balances but are also significantly affected by domestic factors that drive local price differentiation.¹² For example, the relevant price benchmarks and indices for steel products vary geographically, often even on a sub-regional level.

Nonetheless, different levels of environmental commitments and targets around the world already affect the EU steel industry's ecosystem and competitiveness in certain steel grades. This will increase as the sector develops low emission products that cost more but apart from environmental footprint perform identically compared to conventional products. Such imbalances may give rise to carbon-intensive imports, in particular of commodity steel grades, replacing more expensive EU production as a result of higher cost due to environmental commitments, or to direct relocation of industry to less-regulated jurisdictions.

Main actors in the European steel sector

Following a number of consolidation waves (e.g. Mittal/Arcelor (2006), Outokumpu/Inoxum (2012), SSAB/Rautaruukki (2014), ArcelorMittal/Ilva (2018) and the emergence of the Liberty Steel Group (2018-present), the steel industry in Europe has become heavily concentrated. High levels of concentrations often lead to increased prices across many value chains.

¹¹ EUROFER, European Steel in Figures 2020.

¹² M.8444 – ArcelorMittal/Ilva, recitals 321 et seqq.

In the recent consolidation wave, merger control enforcement contributed to keeping vibrant competition in the European steel markets to the benefit of the many downstream industries that use steel, rely on affordable materials to compete globally and employ millions of Europeans. By prohibiting anti-competitive mergers (e.g. Tata Steel/ThyssenKrupp) or approving mergers subject to conditions, such as structural divestitures (e.g. ArcelorMittal/Ilva), merger enforcement ensured that European steel customers are not left with less choice, higher prices, or less innovation.

Top 10 EU Steel Producers, 2019

<i>Company</i>	<i>ktonnes</i>
ArcelorMittal	38 839
Tata Steel	10 000
Thyssenkrupp	8 678
Voestalpine	7 224
Riva	6 306
Celsa	6 276
Salzgitter AG	5 426
SSAB Europe	5 071
Liberty Steel Group	3 988
US Steel Kosice	3 541

Source: EUROFER¹³

Continued vigorous merger control enforcement will play a crucial role during the transition towards a green, digital and resilient EU steel industry. Preserving vibrant competition among European steel players will ensure that the steel industry, which is an energy intensive industry and a major user of raw materials, has the incentives to continue investing in R&D projects and deployment, innovating and improving their production processes to become more sustainable. Such desired beneficial competition should extend to maintain future innovation competition where different companies could develop a range of green technologies, methods and solutions.

The current situation

The COVID-19 pandemic dramatically reduced steel demand in the EU as well as abroad. In its most recent Outlook from October 2020, Worldsteel expected global steel demand to contract by -2.4% and in the developed economies by -14.9%. Major steel consuming economies like India, Japan, the European Union and the United States experienced dramatic demand declines of 18.0%, 19.1%, 15.8% and 22.9%, respectively. The only exception is China where Worldsteel anticipated steel demand to increase by 8% in 2020, aided by government infrastructure stimulus and a strong property market.¹⁴

While the COVID-19 pandemic has had an impact on the steel demand and consumption, under normal circumstances, and without prejudice to the cyclical nature of the industry, steel

¹³ Notes: Total Crude Steel production, all qualities; data refer to EU production

¹⁴ OECD - STEEL MARKET DEVELOPMENTS – Q4 2020: <https://www.oecd.org/industry/ind/steel-market-developments-Q4-2020.pdf>

supply and demand in the EU are in broadly in balance. The structural overcapacities in EU steel production that peaked in the 1970s have been addressed through decades of comprehensive policies on capacity rationalisation and strict State aid control.¹⁵

The global shortfall in demand in 2020 adds to a long-standing problem of overcapacity, which severely undermines the functioning of the global steel markets. According to the latest OECD data, global overcapacity (in nominal crude terms) is now 624.1 million tonnes, i.e. more than three times the full EU capacity (203.1 million tonnes), and one fourth of worldwide steel production capacity (around 2.4 billion tonnes). For the past 15 years, China alone has increased its steelmaking capacity by 599 million tonnes; this increase corresponds closely to the current global excess capacity in crude steel production. Other countries such as India, Indonesia and Turkey have recently also increased their steelmaking capacity. The EU is at the forefront of the international efforts to tackle the problem playing a key role in the creation of the Global Forum on Steel Excess Capacity in 2016. Since 2019, China, Saudi Arabia and India have disengaged from the Forum's work. Nevertheless, joint efforts are needed to address the overcapacity issue and its root causes.

In any case, the relationship between the production capacity for downstream steel products, including high-end steel grades, and global crude steel overcapacity is not linear. Crude steel overcapacities do not necessarily have a direct effect on the capacity, availability and price of various downstream steel products demanded by sophisticated European steel customers, such as car manufacturers and mechanical engineering businesses.

¹⁵ As shown by the Commission's recent merger investigations in cases M.8444 ArcelorMittal/Ilva and M.8713 Tata Steel/ThyssenKrupp/JV, the capacity utilisation in the EU is very high.

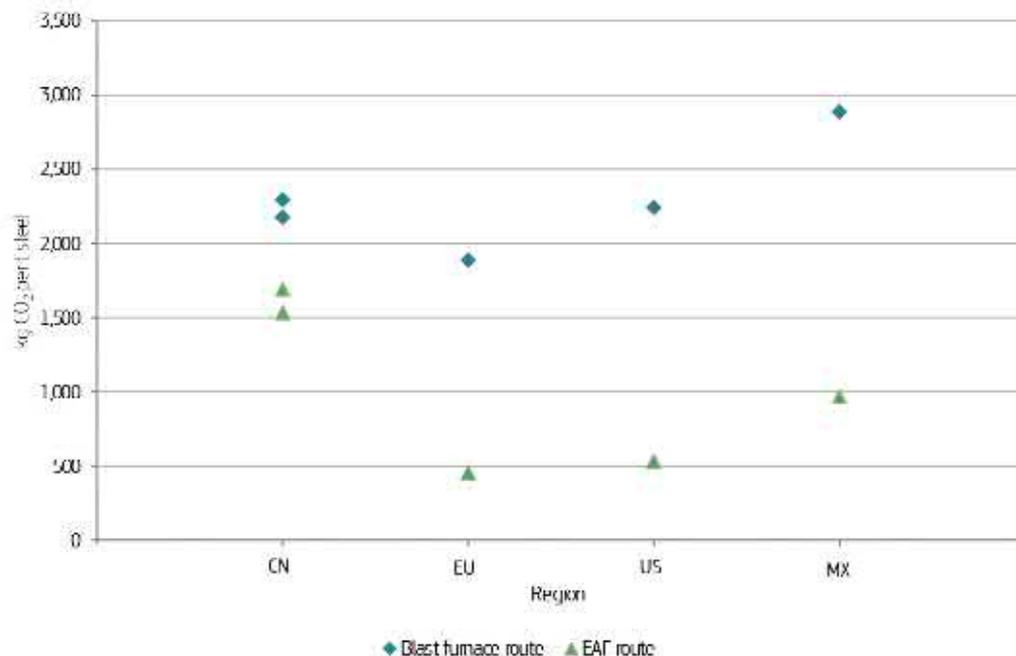
3. The green and digital transition challenge

Going Green

Reducing the CO₂ intensity of the energy intensive industries in general and the global steel sector in particular is crucial for meeting the objectives of the Paris agreement and the EU's own climate targets. The EU steel industry currently accounts for 221 Mt GHG emissions annually (including both direct and indirect emissions). This is 5.7% of total EU emissions. Energy-intensive industries altogether accounted for 665 Mt GHG emission (only direct emissions), 15% of the EU total.¹⁶ To meet the ambitions of the European Green Deal, the steel industry has to transform itself in order to stay competitive.

On average, steel production in the EU belongs to the most CO₂ efficient worldwide, and contrary to production in some third countries (such as Brazil) does not depend on the use of charcoal, which causes deforestation. The EU has the most efficient blast furnaces/blast oxygen furnaces in the world. Their average emissions per tonne of steel produced is close to 2.0 tCO₂, considering direct emissions (scope 1), indirect emissions such as CO₂ imbedded in electricity use (scope 2) and raw material sourcing (scope 3). The emissions factor of the grid electricity is a determinant factor for the CO₂ emissions of the secondary (EAF) route, a significant part of EU electricity already being decarbonised.

Figure 2: CO₂ emissions per tonne of steel in China, the EU, the US and Mexico by process route



Source: Fraunhofer, IMWS (2020)¹⁷, figure adapted

The EU steel industry has already reduced emissions by 26% since 1990, driven by energy efficiency improvements and higher recycling rates.¹⁸ Achieving climate-neutrality by 2050, however, requires radical changes to the way steel is produced. Major steel producers and steel-producing countries (US, China, Japan, South Korea) have recently adopted climate neutrality goals by mid-century. The goal now is to translate this ambition into action.

¹⁶ VUB (2018): Industrial Value Chain: A Bridge towards a Carbon Neutral Europe.

¹⁷ https://www.bdsv.org/fileadmin/user_upload/Final_Scrap_Bonus_PDF_49.pdf. Note: The two data points given for CN refer to two different studies, cf. the original Fraunhofer, IMWS paper.

¹⁸ VUB (2018): Industrial Value Chain: A Bridge towards a Carbon Neutral Europe.

Increased circularity through the EAF route and a shift to fully decarbonised electricity will be imperative, however due to the continued need for virgin steel, fully new processes, such as hydrogen direct reduction and CCUS steelmaking processes, will also be needed.

Figure 3: Main pathways and ongoing projects for low-carbon steelmaking

Pathways/ Groups	Circular Economy Enhancing the recycling of steel (e.g. scrap in BOF/EAF*) and its by-products, Resource efficiency <small>*BOF= Basic Oxygen Furnace EAF= Electric Arc Furnace</small>		
	Smart Carbon Usage (SCU)		Carbon Direct Avoidance (CDA)
	Process Integration with reduced use of carbon (+CCS)	Carbon Valorisation/ Carbon Capture and Usage (CCU) [+CCS]	Hydrogen Electricity
Description	Integration of process steps and internal use of process gases	Using CO/CO ₂ from steel mill as raw material [Chemical conversion of CO/CO ₂]	Use of renewable electricity in basic steelmaking, e.g. production of H ₂ to replace carbon
Projects/ Initiatives	HISARNA, TGR-BF-Plasma (IGAR), PEM, STEPWISE, Torero	Steelanol, Carbon2Chem, FreStMe, Everest, Carbon2Value	HYBRIT, H2Steel (H2Future, SuSteel, Hybrid Steel Making), tkH2Steel, GrInHy, SALCOS, Hydrogen Hamburg, SIDERWIN

Source: Eurofer

Most low-carbon steel production pathways are not yet at technological maturity and it is not yet clear which process will dominate steel production in the future. Nevertheless, they show a high potential for future, innovative technologies, benefitting not only climate but also air quality through a reduction of non-GHG emissions. Therefore, further research, close-to-market innovation and demonstration of multiple pathways will be necessary.

While the commercial roll-out of low-carbon solutions is only expected around 2030, ambitious investments into pilot and demonstration plants are necessary today to enable rapid deployment and European market leadership once the technologies are available.

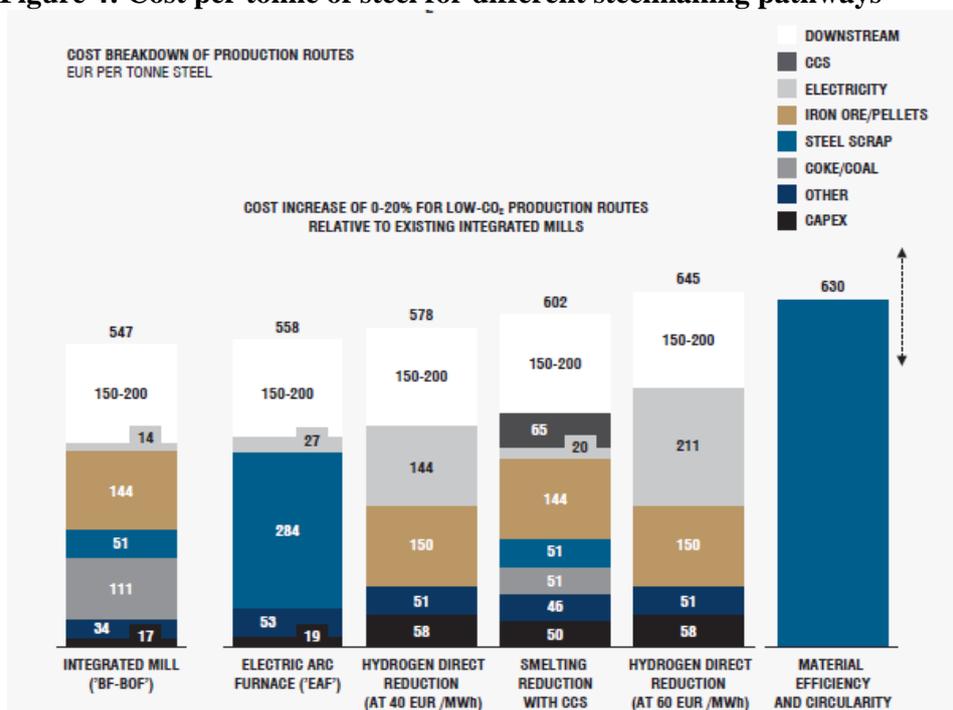
Table 1: Technology Readiness Levels (TRL) of key low-carbon steelmaking technologies

Pathway	Technology	TRL	EU R&D projects (not exhaustive)
Electrification	Increased recycling route (EAFs)	mature	
	Iron ore electrolysis (+EAF)	4	Siderwin
Hydrogen	H-DRI: Hydrogen direct reduction (+EAF) ²	5	Hybrit, Salcos, tkH2steel
	Smelting reduction using hydrogen plasma	4	SuSteel
CCUS	Integrated smelting process combined with CCS	6-7	Hisarna
	Capture and recycle waste gases from the BF-BOF route into synthetic fuels	8	Steelanol, Igar
	Capture and recycle waste gases from the BF-BOF route into chemicals	7	Carbon2Chem, Carbalyst

Source: JRC

Producing steel without CO₂ emissions will come at a cost, however. Even when necessary research and innovation (R&I) investments are excluded, low-CO₂ production routes have a higher cost due to their increased demand for hydrogen, electricity and steel scrap. The figure below shows cost estimates for different production routes, showing an increase of up to 20% for hydrogen direct reduction compared to traditional integrated mills.

Figure 4: Cost per tonne of steel for different steelmaking pathways



Source: Material Economics (2019): Industrial Transformation 2050

The European Steel Association ('Eurofer') estimates that in comparison with conventional steel, it would cost EUR110 to EUR320 more per tonne to produce green steel through the primary (iron ore) route. This difference mainly results from higher operational costs, in particular for the low CO₂ energy and feedstock supply (electricity and hydrogen).

If the full additional cost of green steel falls on the steel producer, it will be unable to compete on price with conventional steel. If the cost is passed through to the end-consumer product, the extra cost with green steel could be under EUR300 more for the price of a car and under EUR20 more for the price of a washing machine. Supportive policy efforts can help to bring about these new markets for 'green' products, generating demand from end-consumers for (slightly) more expensive but more environmentally friendly products. If the extra cost of producing green products is not passed to the end consumer because of competitive pressures from traditional steel makers or because of low demand from consumers for green steel, then it may be necessary to provide temporary compensation for the extra costs and simultaneously take measures to support the business case for clean products.

Closing the loop – the role of circularity

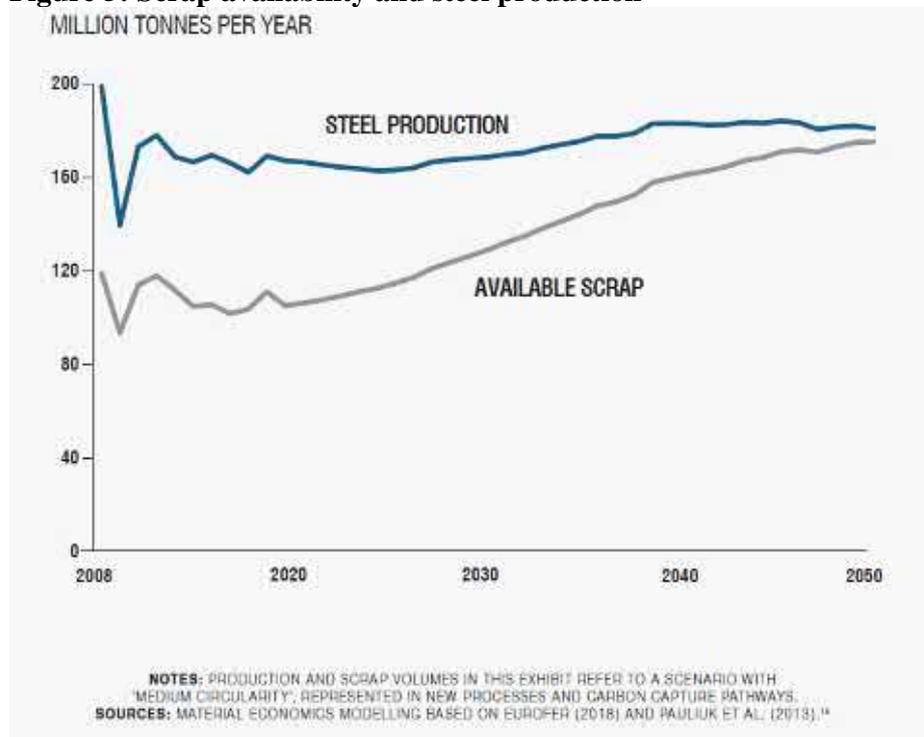
Steel is already a highly circular material. On average, the EU already recovers 85% of end-of-life steel for recycling. Recycling works because of the intrinsic economic value of steel scrap: the 131 Mt of scrap generated in the EU every year is worth some EUR 30 billion. The

EU uses 94 Mt of this scrap, making up half of the iron input to EU steelmaking. It exports 17 Mt, with Turkey the largest destination.¹⁹

Using steel scrap in the production process reduces CO₂ emissions by 58%, air pollution by 86%, water use by 40% and water pollution by 76%.²⁰ However, there are challenges to increasing the share of secondary steel: many steel applications, such as in car manufacturing or structural elements in buildings have low tolerances for copper content. Therefore, mixing different types of steel scraps and other, jointly recycled components containing copper (such as electrical wiring in cars), currently makes it impossible to use secondary steel in certain applications. Circular-by-design approaches and better scrap sorting processes will improve the outlook and help accommodate increased circularity.

By the 2050s, some estimates show that the amount of scrap available in the EU could be as large as total EU annual steel needs, raising the interesting prospect that recycling could satisfy a large part of the EU’s steel needs, if the quality is good enough. Steel could become a nearly fully circular material.

Figure 5: Scrap availability and steel production



Source: Material Economics (2019): Industrial Transformation 2050

The Commission is currently reviewing the Waste Shipment Regulation,²¹ with the aim of stopping exports of waste that have harmful environmental and health impacts in third countries and improving the management of waste exported outside the EU. Other actions outlined in the new Circular Economy Action Plan²², relating to product design, quality and safety of secondary materials and enhancing their markets, will contribute to making “recycled in the EU” a benchmark for qualitative secondary materials.

¹⁹ Material Economics (2019): Industrial Transformation 2050

²⁰ EuRIC (2020): Metal Recycling factsheet

²¹ Regulation (EC) No 1013/2006, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006R1013>

²² COM/2020/98 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>

By-products of the steel sector, such as iron and steel slag and slag-based products are used in the cement and construction sectors as secondary raw materials. However, ferrous slag and slag-based products increasingly face difficulties in being accepted in public tenders. Secondary construction materials are – unlike virgin materials – reportedly forbidden in public tenders due to the burden of undertaking the environmental assessments that tenderers would otherwise have to carry out. This is a real obstacle to Circular Economy and the accomplishment of the Green Deal goals, which could be addressed through prioritisation of secondary building materials in public tenders.

The business case for green steel

The technology pathways are largely known. The remaining challenge is to attract the necessary investment to develop green steel first in Europe. There is an appetite for this, as the plans of most major EU steel producers show. However, several factors need to come together in order to create the business case for investment:

- A policy framework enabling financial incentives to emit less
- market confidence in the long-term stability of the EU regulatory and policy framework
- the availability of EU, national and private funding along the path towards market deployment;
- certainty about the availability of effective carbon leakage measures, and
- robust protection against unfair trade practices.

Chapter 3 describes how the EU policy toolbox already contributes to creating the business case for investment. Remaining challenges are also identified.

Digitalisation – an important enabler for green and circular steel

The steel sector has long been a front-runner in digitalising its processes in order to improve resource efficiency and reduce emissions. Further digitalisation of the sector and better use of industrial data can optimise steel supply chains and enable new business models.

Digital technologies will also act as crosscutting enablers for industrial transformation in the energy-intensive industries (EIIs). Increased automation, process control and demand-side response will result in greater resource efficiency. Digital technologies can speed up the deployment of breakthrough processes and product innovation. Machine learning and artificial intelligence are strategic technologies for the development of new or advanced materials and catalysts. Blockchain technologies can facilitate tracking of supply chains and products' carbon footprint. Digital product passports should be a major contribution to sustainable product policy and enable greater circularity, including for the EIIs.

A report by Branca et al. (2020) in the journal *Metals*²³ reviews the challenges and opportunities that lie in the digitalisation of the steel sector. It outlines the potential for increasing production efficiency and sustainability with the use of digital technologies, such as Internet of Things, predictive maintenance and robotics. It also emphasises the importance of continuous updating of workers' skills and discusses the role European research programmes and skills blueprints play in driving their adoption.

Data sharing among industrial players will be important. The Commission's proposal for a Data Governance Act²⁴ addresses the need for clear rules on secure data sharing. The EU's Digital Europe Programme will invest in data spaces to optimise supply chains and predictive maintenance.

²³ <https://www.mdpi.com/2075-4701/10/2/288/htm>

²⁴ COM/2020/767 final , <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0767>

To handle the new process conditions and the corresponding new issues, e.g. related to safety and the stronger fluctuations of energy supply and process conditions, Machine learning and artificial intelligence techniques will play an ever-increasing role. Cybersecurity aspects must be deployed with specific strategies devoted to the steel sector.

4. The EU toolbox - towards green, digital and resilient EU steel industry

4.1 Funding and budget programmes

4.1.1 The Recovery and Resilience Facility

The COVID-19 pandemic has created enormous challenges for industry, but also opportunities to accelerate the transition and to ‘build back better’.²⁵ The EU and its Member States have secured a stimulus package of EUR 1.8 trillion made up of the new long-term budget for 2021-2027 and the Next Generation EU (NGEU) recovery package. The Recovery and Resilience Facility (RRF) is the cornerstone of that package, with EUR 672.5 billion available in loans and grants to support reforms and investments undertaken by Member States. Member States will prepare recovery and resilience plans that set out a coherent package of reforms and public investment projects. To benefit from the support of the Facility, these reforms and investments should be committed by 2023 and implemented by 2026.

Each recovery and resilience plan should allocate at least 37% and 20% of the Recovery and Resilience Facility for investments and reforms that foster respectively the green and digital transitions. The Commission will assess the plans against these targets.

NGEU and in particular the RRF provide an unprecedented opportunity for industry and Member States to accelerate the decarbonisation of heavy industries like steel, developing resilient value chains and building open strategic autonomy. Such investments offer the opportunity to bring the industry onto a transition path towards climate neutrality, recognising that initial projects may not be fully carbon-free themselves but nevertheless contribute to the necessary advancement of low-carbon technologies. Projects relating to breakthrough technologies, such as hydrogen-based steelmaking, carbon capture, utilisation and storage, investments in infrastructure and skills will be important and could be financed under RRF, provided that they comply with the “do-no-significant-harm” principle, ensuring that they do not significantly harm the environment.²⁶

4.1.2 Research and Innovation

The EU needs to step up its R&I in breakthrough technologies to support the development of green steel. Building on the work already carried out under past Framework Programmes and with the help of the Research Fund for Coal and Steel (RFCS), the Commission is launching a Horizon Europe European partnership on clean steel.²⁷ It will focus on accelerating and deploying the most promising solutions for climate-neutral steel production. The partnership will support research and innovation activities from the pilot to the demonstration phases of breakthrough technologies for carbon neutral steel production, while leveraging private investments.

The specific aims of the clean steel partnership are:

- Developing, testing and scaling breakthrough technologies for clean steel production consistent with the climate neutrality objective by 2050.
- Achieving TRL 8 by 2030 in at least 12 technologies funded by the Partnership;

²⁵ OECD (2020): Building back better: A sustainable, resilient recovery after COVID-19, <https://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/>

²⁶ Commission Notice C(2021) 1054 final clarifies that, in relation to measures supporting activities covered by the EU Emission Trading System (ETS) in particular, in order not to distort the market signals put in place by the ETS, activities with projected CO₂ equivalent emissions that are not substantially lower than the relevant benchmarks established for free allocation should generally not be supported under the RRF.

²⁷ SWD(2021)351, Annual Single Market Report 2021, Annex II

- Ensuring the construction by 2030 of at least two demonstrations of a technological pathway (Carbon Direct Avoidance, Process Integration, Carbon Capture and Usage, Circular Industry) leading to 80% CO₂ emission reduction compared to 1990 levels for the plants where the demonstration projects are implemented.
- Fostering European steel competitiveness tackling digitalisation, upskilling and new markets creation.
- Providing the European Steel sector with a first mover advantage to introduce clean steel technologies.

Based on the estimated industrial efforts from the steel sector in R&I projects falling within the scope of the Clean Steel Partnership, the total resource requirement is estimated at around EUR 2.5 billion, as estimated by ESTEP, the European Steel Technology platform, representing the private side of the Clean Steel partnership. Once a technology has successfully been demonstrated, an additional investment of around EUR 9 billion is needed for its first roll-out.

The alignment and coordination of private and public funding ensures financing up to the deployment phase. The European Parliament Pilot Project “Green Steel” will provide a set of scenarios on this.

The clean steel partnership relies on synergies of funds up to EUR 700 million coming in equal parts from Horizon Europe and assets of the European Coal and Steel Community in liquidation. The Commission is exploring the possible use of part of the funding under the European Coal and Steel Community ‘in liquidation’ (ECSC). A revision of the RFCS legal bases (announced in the Commission’s EU Green Deal Investment Plan in January 2020²⁸) is moving forward with the aim to be adopted in 2021 .

Steel will also be part of a broader Horizon Europe partnership on energy-intensive industries. Under Horizon 2020, the steel sector was part of the public-private partnership SPIRE - Sustainable Process Industry through Resource and Energy Efficiency. It addressed process optimisation, waste material recovery, alternative feedstock, waste energy valorisation and industrial symbiosis. Under Horizon Europe, this will become the European partnership Processes4Planet. This partnership aims at circularity and an extensive decarbonisation of European process industries, with a strong focus on competitiveness with a cross sectorial approach.

4.1.3 Innovation Fund

The Innovation Fund established under the EU Emissions Trading System²⁹ is one of the world’s largest funding programmes for the demonstration of innovative low-carbon technologies in multiple sectors, including energy-intensive industries such as steel. It will provide about EUR 18 billion³⁰ of support over 2021-2030 for the commercial demonstration of innovative low-carbon technologies (in energy intensive industries, including CCS and CCUS; renewable energy; energy storage), aiming to bring to the market industrial solutions to decarbonise Europe and support its transition to climate neutrality.

The first call for large-scale proposals with capital expenditure above EUR 7.5 million closed in October 2020 and received 311 proposals for innovative clean tech projects located in all Member States and covering all sectors, including steel. Following the evaluation of the first

²⁸ COM/2020/21 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0021>

²⁹ Commission Delegated Regulation (EU) 2019/856 of 26 February 2019 supplementing Directive 2003/87/EC of the European Parliament and of the Council with regard to the operation of the Innovation Fund, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R0856>

³⁰ Assuming a carbon price of EUR 40/tCO₂-eq.

stage of the application process, 70 projects continue to the second stage and submit full applications for the first Innovation Fund call for large-scale projects, while all applicants have been informed about the results. Grants will be awarded at the end of 2021. .

The Commission is also running the first call for small-scale projects under the Innovation Fund with capital expenditure between EUR 2.5 and EUR 7.5 million. The Commission received 232 applications for innovative clean tech projects in renewable energy, energy-intensive industries, energy storage, and carbon capture, use and storage (CCUS).³¹ Applications come from projects to be implemented in all Member States, Iceland and Norway and the proposed projects have requested a total of more than EUR 1 billion. Proposals that fulfil the admissibility and eligibility conditions will be evaluated by external evaluators against the award criteria and applicants will be informed about the results of the evaluation in August 2021. The grants will be awarded in the end of 2021.

Further calls for proposals, one for large-scale and one for small-scale projects, are planned to be launched later in 2021.

For energy intensive industries, such as steel, the main technological pathways outlined in the proposals focus on hydrogen, carbon capture use and/or storage (CCUS), as well as recycling (e.g. scrap metal, plastics), pyrolysis, and electrification. The upcoming proposal for a revision of the EU ETS in light of increased climate ambition and its accompanying impact assessment will also address the future of the Innovation Fund.

4.1.4 InvestEU

The InvestEU Fund, as part of the InvestEU Programme, will finance a wide range of investments, including in energy-intensive industries. An EU Guarantee of EUR 26.2 billion underpinned by budgetary means of the Next Generation EU recovery instrument and the Multiannual Financial Framework 2021-2027, will allow additional public and private investments of around EUR 370 billion.

Financial support under the InvestEU Fund is demand-driven and can take various forms of equity or loan finance provided by the European Investment Bank Group or other implementing partners.

The InvestEU Fund, with its four priority areas (“policy windows”), has a strong focus on financing investments that have a positive climate and environmental impact. The InvestEU’s Sustainable Infrastructure Window supports investments in sustainable industrial applications which help reduce greenhouse gas emission. The InvestEU’s Research, Innovation and Digitisation Window supports new environmentally sustainable technologies that lead to the reduction of greenhouse gas emissions of energy-intensive industries. Both windows are relevant for steel.

4.1.5 Sustainable financing taxonomy

On 8 March 2018, the EU Commission published its Action Plan: “Financing Sustainable Growth”, stating the need for a deep rethink of the European financial framework. The Action Plan describes the EU strategy for sustainable finance and is part of the implementation plan of Article 2(1)(c) of the Paris Agreement, relating to the alignment of financial flows with global climate goals and the UN 2030 Agenda for Sustainable Development.

The Sustainable Financing Taxonomy forms part of the implementation of the Action Plan on Sustainable Finance. It aims to further incentivise and channel private sector investment into

³¹ https://ec.europa.eu/clima/news/first-innovation-fund-call-small-scale-projects-232-applications-eur-100-million-eu-funding_en

sustainable development, by making investors more aware of what they invest in and by giving investors important tools to invest sustainably.

The first Delegated Acts setting sustainable financing taxonomy criteria for climate change mitigation and adaptation and aligned on the European Green Deal has been approved in principle on 21 April 2021 and will be formally adopted at the end of May.

Steel production is included among the activities listed in the EU taxonomy for sustainable investments to incentivise environmental improvements in the manufacturing of steel over time. While steel production is not low carbon today, the technical screening criteria for steel production in the taxonomy recognise the most climate-friendly forms of production, while ensuring no significant harm to other environmental objectives. The technical screening criteria also recognise the important role of research, development and innovation activities in low-carbon steel manufacturing technologies, especially for those technologies which are at an already advanced stage of development but not yet commercial. The criteria will tighten over time to ensure the need for constant efficiency gains and improvements in the environmental footprint of steel manufacturing. Capital expenditure for investments to reach these criteria will be eligible for green bonds under the forthcoming EU Green Bond Standard.

The taxonomy criteria for manufacturing of steel are setting a long-term ‘gold standard’, encourage investment in new breakthrough technologies with which markets are as yet unfamiliar and leave room for transitional investments that help the steel industry move towards the European Green Deal goals.

4.1.6 Competition policy

As for any other sector, investment and structural adjustments of steel output in the EU are genuinely market driven. Investment in development and deployment of breakthrough low-carbon technologies will require private financing, supported however by relevant EU programmes and national measures, where necessary and compatible with EU State aid rules. As such, the steel sector can benefit from certain types of State aid to replace existing production processes with less or even zero emitting ones.

State aid is possible for Research, Development and Innovation (RDI) activities into innovative breakthrough clean technologies, as well as for RDI activities into digital tools relevant for the industry’s transformation.

Under the Guidelines on State aid for environmental protection and energy (EEAG), aid may be granted for the introduction of climate or other environmental friendly technologies. The Commission is currently preparing the revision of the EEAG. The support is limited to the shift to green technologies and may not generate undue distortions of competition and trade in the internal market. It must also meet the compatibility requirements under State aid rules.

For example, steel producers may receive investment aid through national aid schemes for significantly improving the environmental footprint of their production facility, if the positive impact on environmental protection substantially exceeds, on the one hand, the level required by law or envisaged by Union objectives and, on the other hand, what the market itself would bring about. The aid must be limited to the extra environmental costs, comply with applicable maximum aid intensities and be subject to tendering. Similarly, under certain conditions, in particular, when competitive bidding takes place, operating aid would be possible to partially compensate steel producers for the additional costs caused by the generation of renewable energy or energy sources, such as renewable/green hydrogen. However, the support is limited to the difference between the costs for producing/purchasing grey energy and the costs for producing/purchasing green energy.

The Commission has recently adopted a State aid decision that approves aid via Carbon Contracts for Difference (CCfD) for renewable energy production, low carbon hydrogen production, low carbon electric boilers, CCS and waste heat recovery.³² Cross-sectoral competitive bidding processes were required to select beneficiaries of the support. Aid is linked to CO₂ emission reductions, taking into account also the indirect emissions of electricity.

IPCEI

Important projects of common European interest (IPCEIs) are typically ambitious cross-border research and innovation projects or infrastructure projects with a European dimension entailing significant risks and generating significant spillover effects across the EU that would not be carried out without significant pooling of public and private resources and investments and cooperation between Member States.

Steel producers, like other project owners, could receive aid for ambitious research and development and aid for first industrial deployment provided their project generates important spillovers. Both investment aid and operating aid are allowed, but only for the duration of the research or development phase and during the first industrial deployment; long-term operating aid is not possible. Therefore, the IPCEI rules exclude both investment and operating aid for the commercial mass production phase of such projects.

A project that is part of an integrated IPCEI needs to demonstrate that it is necessary to reach the objective of the IPCEI and complementarity to the other projects. Research and first industrial deployment projects must in addition demonstrate that they deliver innovations going beyond the state of the art, while infrastructure projects need to be of major importance, either for the environment, for energy or for the Union's transport strategy. Environmental, energy or transport facilities and infrastructure that are not accessible to third parties on non-discriminatory terms do not count as generating the necessary significant spillovers across the EU.

Where an undertaking receives aid as part of an important project of common European interest, it is required, inter alia, to demonstrate positive spillover effects beyond the beneficiary undertaking or the economic sector or the Member State concerned. Similarly, distortions of competition caused by the aid must be limited as far as possible and in this case additional spillovers must outweigh possible distortions. Demonstrating these two criteria could be more challenging for application projects than for open infrastructure projects. In addition, the IPCEI must respect the principle of phasing out environmentally harmful subsidies.

Relevant Industrial Alliances could also be an opportunity to identify relevant gaps and types of projects that can address them, possibly in view of forming IPCEIs). Steel stakeholders are actively engaged in the European Raw Materials Alliance and in the Clean Hydrogen Alliance. They are also involved in the work by 22 Member States to prepare an IPCEI on hydrogen³³ and interested in a possible IPCEI for low-carbon industry, building on the work of the Strategic Forum for Important Projects of Common European Interest.³⁴

The EEAG, IPCEI and RDI State aid rules are currently undergoing a revision process.

³² Commission Decision C(2020) 8773 final regarding State Aid case SA.53525 (2020/N) – The Netherlands SDE++ scheme for greenhouse gas reduction projects including renewable energy. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2410

³³ https://www.bmw.de/Redaktion/DE/Downloads/M-O/manifesto-for-development-of-european-hydrogen-technologies-systems-value-chain.pdf?__blob=publicationFile&v=8

³⁴ Strengthening Strategic Value Chains for a future-ready EU Industry - report of the Strategic Forum for Important Projects of Common European Interest, <https://ec.europa.eu/docsroom/documents/37824>

4.2 Supportive regulatory environment

4.2.1 EU Emissions Trading System

The EU ETS has proven to be an effective tool in reducing greenhouse gas emissions and it will play a key role in achieving the increased 2030 climate ambition. In line with the European Green Deal, the Commission will present its proposal for a review of the EU ETS in June 2021.

The increased 2030 climate ambition will require a strengthening of the emissions cap of the ETS. This could be achieved either through a change in the linear reduction factor which determines the rate of annual reductions in the cap, through a one-off reduction of the cap (rebasement), or through a combination of both. The Commission is assessing which option for strengthening the cap would be most opportune, also in the context of the review of the functioning of the Market Stability Reserve.

The ETS has an effective carbon leakage protection framework³⁵ and the Commission aims to ensure this will remain the case in the future. The possible impact of a strengthened cap on the availability of free allocation for industry and risks of carbon leakage is also being assessed.

4.2.2 Affordable, accessible and abundant decarbonised energy

Steel is an energy intensive sector with relevant energy costs shares in its production costs: 7.7% on average for the aggregate sector between 2010-2017,³⁶ but this share can reach up to 20%³⁷ for certain steelmaking processes, such as the electric-arc furnace secondary steel.

Coal currently plays an important role in the sector, not only covering energy needs but also providing a key chemical function in the process, but it is next in line to be phased out and must be replaced by decarbonised energy sources, or be combined with carbon capture technologies. All low-carbon production pathways for steel rely on the intensive use of electricity – either directly, as in EAF steel recycling and electricity-consuming CCUS equipment, or indirectly through the use of green hydrogen. The steel industry estimates that it will require about 165 TWh of electricity and 5.5 million tonnes of hydrogen annually by 2050 to make the total current volume of primary steel using hydrogen, resulting in a total electricity demand of 400 TWh – four times what the sector currently consumes.³⁸

Given the vastly increasing demand for electricity in all sectors of the economy (electric vehicles, heat pumps, electrolyzers, etc.),³⁹ the expansion of renewables and their integration into the energy system⁴⁰ – through expansion and upgrading of grids and through instalment of massive energy storage capacity to accommodate supply variability – will have to keep pace. For hydrogen, new infrastructures will have to be built, complementing the existing gas grid, and the cost of electrolyzers will have to come down through technological development. This will require more ambitious commitments and investments from Member States and an infrastructure planning framework that takes into account the changing needs of energy-intensive industries.

³⁵ Ex-post studies have not found substantial levels of carbon leakage from existing mechanisms like the EU ETS, although other studies argue that carbon leakage has not happened precisely because of the free allocation of allowances. https://www.eca.europa.eu/Lists/ECADocuments/SR20_18/SR_EU-ETS_EN.pdf

³⁶ Report on energy prices and costs in Europe, SWD/2020/951 final, Table 13. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2020:951:FIN>

³⁷ Production costs from the iron and steel industry in the EU and third countries, JRC121276 available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC121276>

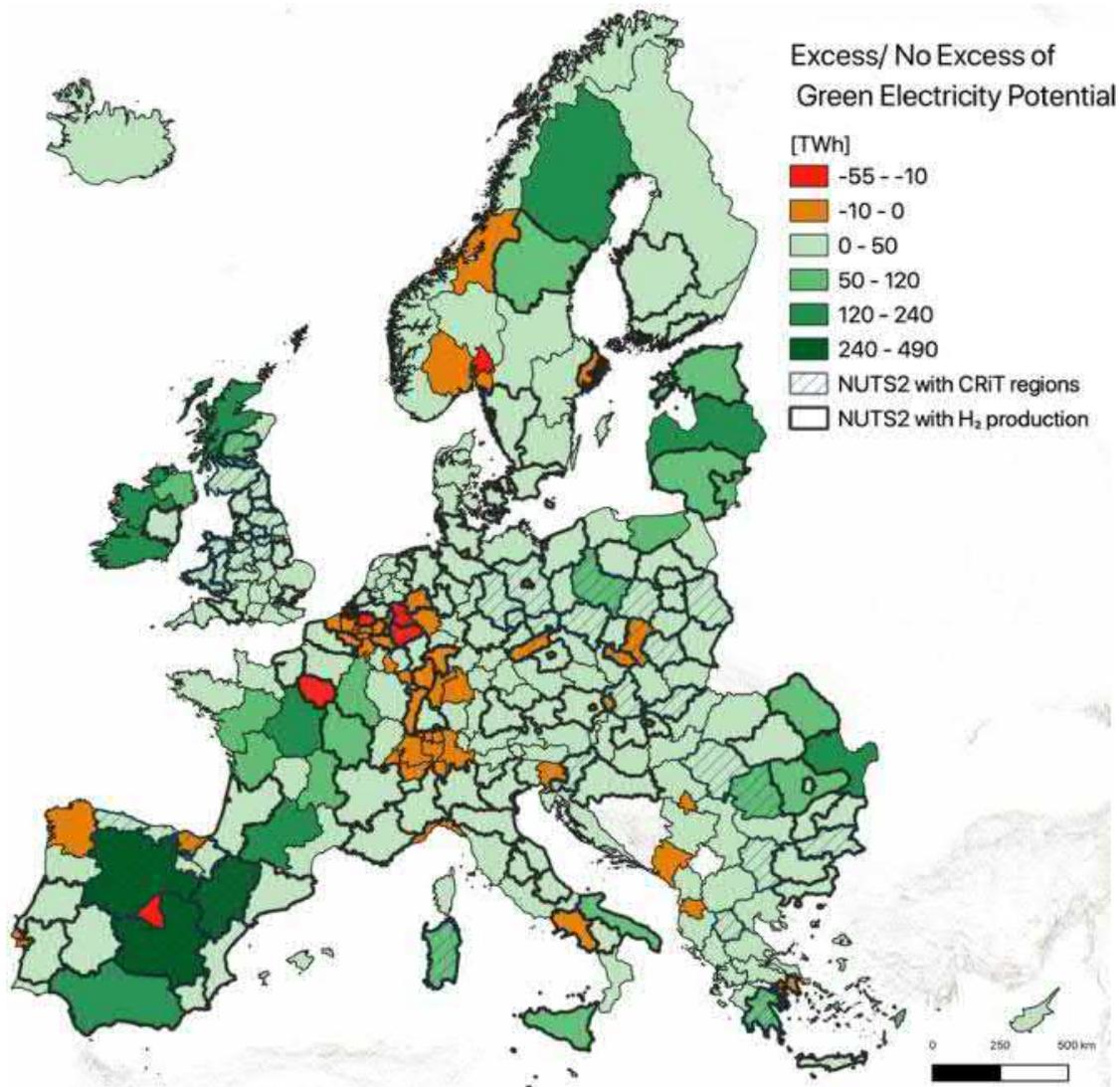
³⁸ 2019 EU27 electricity consumption of the steel sector in Eurostat is 110 TWh.

³⁹ Total electricity demand in the EU projected to more than double by 2050, cf. Impact Assessment accompanying the 2030 Climate Target Plan, SWD(2020) 176 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020SC0176>

⁴⁰ Cf. EU Strategy for Energy System Integration, COM(2020) 299, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2020:299:FIN>

Especially challenging is that, absent challenging relocations of entire industrial clusters, industrial electricity demand will increase in places where these clusters are currently located and not necessarily where renewable energy sources are abundant. This could create increasing geographical imbalances, which would have to be addressed through long-range electricity transmission or hydrogen transport, including possible import from other renewables-rich regions (such as North Africa). The Commission’s proposal for a revised TEN-E Regulation, adopted on 15 December 2020,⁴¹ would adapt the EU framework for cross-border projects to better integrate renewables, CCS and hydrogen infrastructure; it also proposes to simplify and accelerate permitting and authorisation procedures.

Figure 6: Regional assessment of renewable energy potential and future electricity consumption⁴²



Source: Kakoulaki et al. (2021): Green hydrogen in Europe – A regional assessment: Substituting existing production with electrolysis powered by renewables

⁴¹ COM(2020) 824 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0824>

⁴² Renewable energy potential based on JRC ENSPRESO data; future electricity consumption based on current electricity consumption plus electricity requirements to move from fossil fuel-based to green hydrogen

As the electricity price becomes an increasingly dominant factor in the cost of steel and other basic materials produced by the energy-intensive industries, reducing the cost of producing, storing and transmitting (renewable) power is of prime importance. The regulatory framework in relation to electricity markets, network charges and taxation will remain key to ensure competitively priced electricity and support the electrification and decarbonisation of the industry and to maintain its international competitiveness.

Electricity prices may display a higher short-run volatility as a result of the increasing shares of intermittent renewables and a slow uptake of flexible demand and energy storage. This could be challenging for some industrial consumers, but offer opportunities for others. Electro-intensive industries that can adjust their production flexibly (such as aluminium smelters) already today offer “interruptible load” to grid operators, meaning that part of their electricity load can be cut off at short notice to stabilise the grid, for which they receive substantial compensation. In the future, as regular patterns of electricity prices emerge (e.g. a daily trough around midday, when solar generation is strongest), more industries, such as the steel industry, could adapt their production cycles to both provide grid balancing services and benefit from lower electricity prices.

4.2.3 Carbon Border Adjustment Mechanism

The Commission is currently carrying out an impact assessment on a Carbon Border Adjustment Mechanism (CBAM), which is set to be proposed by summer 2021. It will assess different design options against the objectives of the mechanism, which is to avoid carbon leakage, and its economic, environmental and social impacts. Additional criteria include the administrative and compliance costs, the feasibility and legal aspects of the mechanism. CBAM will be compliant with World Trade Organization rules and other international obligations of the EU.

CBAM is essentially an environmental measure to enable the EU’s increased climate ambition by reducing carbon leakage risks. CBAM will ensure that the price of import reflect their carbon emissions.

Steel is one of the sectors included in the possible initial shortlist of CBAM sectors. The choice of sectors will take account of multiple criteria, balancing coverage in terms of greenhouse gas emissions while limiting complexity and administrative effort. Criteria under discussion include whether the sector is a significant emitter of greenhouse gas emissions and the sector’s exposure to a significant risk of carbon leakage, based on trade intensity as well as carbon intensity, as defined pursuant to the EU ETS Directive.⁴³

The impact assessment will take account of the results of the public consultation open to all stakeholders. The responses received indicate that the steel sector should be included in the sectoral coverage of the CBAM.⁴⁴

4.2.4 Standardisation

Standardisation will be important to create markets for clean technologies. While normal-performing companies focus on making quality products, more advanced companies also seek to maximise the setting of patents for innovation. The best companies go one step further and

⁴³ Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814, OJ L 76, 19.3.2018, p. 3–37.

⁴⁴ Summary Report: Public consultation on the Carbon Border Adjustment Mechanism, p.4. Ref. Ares(2021)70541 - 05/01/2021 <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-EU-Green-Deal-carbon-border-adjustment-mechanism-public-consultation>

seek to set the standards that the whole world will follow. The EU has traditionally been at the forefront of standard-setting and is now freshly aware how strategically important standard-setting has become for the green and digital transition.

At the request of the Commission⁴⁵, the European standardisation bodies developed a generic standard to encourage performance improvements in industrial installations. It includes EN 19694-2 for steel, which sets out the CO₂ accounting rules and metrics to assess the emission performance of steel production facilities.

The EN 19694-2 standard enables application of a life cycle approach, with the potential to provide accurate signals to producers and investors alike on the sustainability performance along the entire steel value chain, including all inter-connected steelmaking processes.

4.2.5 Industrial Emissions Directive

Steel production brings a number of environmental impacts including air emissions (CO, SO_x, NO_x, dust), emissions to water, hazardous wastes, and solid wastes. In 2017, 222 iron and steel installations were operating under the Industrial Emission Directive (IED) permit.⁴⁶

The Commission regulates emissions falling under the IED through Commission Implementing Decisions establishing Best Available Techniques (BAT) conclusion for Iron and Steel Production and Ferrous Metal Processing. The Technical Working Group established under the so-called Sevilla Process (involving Member States, environmental NGOs and industry), is presently reviewing the BAT Conclusions for Ferrous Metal Processing. EUROFER represents the steel industry there. The Commission expects to adopt the revised BAT Conclusions in late 2021 or early 2022.

Although regulating GHG emissions is not a primary objective of the Industrial Emissions Directive⁴⁷ (IED), standards set by the Directive impose emissions prevention or reduction techniques to steel producers, which may affect also CO₂ levels. The recent evaluation⁴⁸ concluded that the IED was effective in curbing pollution from industrial installations, especially to air, but that it was less effective on issues concerning decarbonisation, efficient use of energy and raw materials or waste management. The Commission is currently revising EU rules on industrial emissions⁴⁹, recognising that the same new technologies will often allow reducing emissions of both pollutants and greenhouse gases. The revision will aim to accelerate the uptake of circular economy and the zero-pollution innovation, and the Industrial Emissions Innovation Observatory will play a key role, monitoring innovations and accelerating the identification of new techniques that may qualify as BAT.

A first online stakeholder workshop took place on 15 December 2020. The Online Public Consultation and the Targeted Stakeholder Consultation ended in March 2021 and the results will feed into the impact assessment.

Decarbonisation roadmaps for the sector show a high potential for future, innovative technologies, possibly leading to a step change in terms of GHG emissions by 2050. Generally, their deployment would have a positive direct impact on air emissions, particularly of NO_x and SO_x.

4.2.6 Construction Products Regulation

⁴⁵ 6 Mandate M/478 - Standardisation mandate to CEN, CENELEC and ETSI for the development of EU technical standards in the field of greenhouse gas emissions

⁴⁶ Assessment and summary of Member States' reports under Commission Implementing Decision 2018/1135/EU EU27 horizontal analysis; Final report.

⁴⁷ Directive 2010/75/EU

⁴⁸ Wood (2021): Wider environmental impacts of industry decarbonisation, [final study report](#)

⁴⁹ Directive 2010/75/EU and Regulation (EC) No 166/2006

Construction, buildings and engineering works are a major customer of the steel industry as they use around 50% of all steel consumed in Europe. Structural steel products used in construction works must comply with the CPR provisions and are subject to harmonized European standards.

The Commission is reviewing the CPR. This review is looking at developing environmental performance requirements for construction products with a view to finding a unified method to establish the environmental footprint of all construction products in line with horizontal principles set in the Sustainable Product Initiative. The Commission is developing this in consultation with industry and Member States. Structural steel products will be one of the first families of products analysed for these new harmonized technical specifications. The adoption of the revised CPR proposal is expected in late 2021 or early 2022.

4.2.7 Sustainable Products Initiative

The Circular Economy Action Plan announced that the Commission would come forward with a legislative proposal (the Sustainable Products Initiative, ‘SPI’) to increase product sustainability in the EU.

The central focus of SPI will be to extend the scope of the Eco-design Directive, and eventually propose additional legislative and non-legislative measures to address objectives that could not be achieved through the revision of the Ecodesign legislation.

The Circular Economy Action Plan identifies steel as one of the priority product/material groups with untapped potential for circularity, along with electronics, ICT, textiles, furniture, as well as other intermediate products such as cement and chemicals. Steel has great potential to contribute to a climate neutral EU since it is a naturally long-lasting and durable product, well adapted for recycling, reuse and remanufacture.

The Commission is looking into how the SPI and sectoral legislation can support efforts to become more circular. In particular, having steel in scope of the SPI will steer the definition of agreed sectoral rules for the calculation and communication (via a digital product passport) of life cycle environmental footprint, other environmental characteristics like recyclability and recycled content, and social information/indicators for steel and steel-based products. This may lead to the definition of classes of environmental performance, and to measures to promote the uptake of low-carbon and sustainable steel in the EU market(s), including through minimum sustainability requirements in public procurement.

4.2.8 Public Procurement

Public procurement accounts for a large proportion of European consumption (nearly 15% of EU GDP), especially in sectors like construction, energy and telecommunications.

Green public procurement can help to create demand for clean products, like green steel, and green value chains. It is shifting towards a life-cycle costing approach, including trade-offs between production and use-phase emissions. There are substantial differences in the openness of public procurement markets worldwide, which is relevant for the steel sector. To combat the spread of discriminatory buy national practices, it is necessary to promote openness and reciprocity in global procurement. In 2016, the Commission revised its legislative proposal for an International Procurement Instrument (IPI). It aims to open third countries’ markets by creating leverage in negotiations on procurement. It involves the investigation of measures impairing the access of EU companies to third country procurement markets and consultation to remove such barriers. If consultations are unsuccessful, IPI could lead to the adoption of restrictive measures on relevant third country operators, goods and services in EU procurement procedures. In the 2019 EU-China Communication, the Commission called (under Action 6) for adoption of IPI. The European Council also called in

October 2020 for accelerating the work on IPI. A swift agreement on the proposed International Procurement Instrument will be essential to address lack of reciprocity and to give the EU further leverage in negotiations.

4.3 Global supply chains

4.3.1 Need for a global level playing field

EU steel producers face challenges related to the absence of a level playing field with regard to subsidies, unwarranted trade tariffs and global overcapacity. Exports of the EU steel industry have declined by more than a quarter between 2017 and 2020, mainly due to protectionist measures adopted by its trading partners as well as to trade diversions resulting from those measures. The Covid-19 crisis has exacerbated this negative trend.

On the import side, the EU's trade defence instruments play an important role in restoring a level playing field on the EU market. Notably the steel industry has in the last years, in line with China's rapidly growing steel capacity, seen an increase in imports of dumped and subsidised steel.

The EU has countered this with resolute use of trade defence instruments to level the playing field. The EU steel industry benefits from a large number of anti-dumping and anti-subsidy measures. About one third of all TDI measures concern distorted and injurious imports of steel products, notably from China. Of the 55 trade defence measures in place on steel over half (28) concern imports of steel from China. Overall, the trade defence measures in place on steel protect 197.000 direct jobs, out of a total number of almost 445.000 direct industrial jobs shielded by TDIs across all sectors.

TDI measures have proven to be highly effective: imposition results usually in substantial decrease or complete disappearance of unfair imports⁵⁰. At the end of 2018, for cases opened as from 2015, the average decrease in injurious imports for steel products under measures was close to 90 %. At the same time, statistics show that in the chain of supply, unfair imports are usually replaced by EU production and/or imports that are not dumped or subsidised. Thus, AD and AS duties restore the level playing field (both for the EU producing industry and other third country suppliers), allowing EU users to continue enjoying diversified sources of supply.

The EU has also increased its use of the anti-subsidy instrument to address new forms of harmful subsidisation. For instance, by countering different and new types of State support in China used to build up capacities abroad (so-called transnational subsidies, 'Belt & Road' initiative). After changes to the trade defence legislation in 2017 and 2018, the EU can impose measures faster and suspend the lesser duty rule in certain circumstances, possibly leading to higher measures. The revamped instruments also allow the EU to address certain environmental concerns, such as the level of environmental protection when selecting a representative country and adding the EU industry's prospective cost of environmental regulation when assessing injury.

The situation of the steel sector has been further disrupted by the US Section 232 measures, which saw the imposition in March 2018 of 25 % duties on imports of foreign steel. The US action made the EU market vulnerable to a potential trade diversion of steel products otherwise destined for the US market.

⁵⁰ E.g. in the case of seamless pipes from China by 98%, of steel rebars from Belarus by 86%, of stainless steel tube fittings from China and Taiwan by 81%, of corrosion resistant steels from China by 100%, of heavy steel plate from China by 99%. At the end of 2018, for cases opened as from 2015, the average decrease in injurious imports for steel products under measures was close to 90%.

To prevent economic damage to the EU steel producers from the trade diversion, the Commission introduced provisional safeguard measures in July 2018 on imports of certain steel products and then definitive measures in February 2019 for a period of three years, i.e. until 30 June 2021. The safeguard measure has been effective. Imports went down from a peak of 33.4 million tonnes in 2018, to 28,8 million tonnes (-13,3%) in 2019, which was the first full year covered by the measure. In June 2020, the Commission further adjusted the functioning of the measure to ensure that it remained effective in a changing economic context, largely impacted by the COVID-19 pandemic.

A safeguard measure is an extraordinary short-term measure to provide interim relief to a sector (in this case steel) in the form of protection against imports for a limited period, while other medium and longer term measures are designed and implemented to ensure its viability. The current safeguard measure takes the form of tariff-rate quotas on 26 categories of steel. The Commission is currently investigating, following a substantiated request from 12 Member States, whether the measure should be prolonged beyond its current expiry date, 30 June 2021

4.3.2 International partnerships

The Global Forum on Steel Excess Capacity (GFSEC), launched by the G20 in 2016, works to address the problem of global excess capacity by tackling distortive government policies and measures that contribute to it. The GFSEC has agreed a set of principles to address global overcapacity, including the issue of trade distorting state interventions. The next step is to ensure that all producing economies apply these agreed principles.

The EU continues to be active in the GFSEC, to promote and further develop its principles, and to retain its relevance by reengaging China, which decided to leave the GFSEC in 2019. The OECD Steel Committee provides another valuable forum for addressing the global problems of the sector.

The EU will also actively contribute to the G7's work on resilience within the newly founded Economic Resilience Panel and promote industrial decarbonisation as a key area for closer cooperation among G7 countries. With the economic weight of this group, representing about half of the world's GDP, there is a real chance to motivate a critical mass of companies to invest into low-carbon technologies in hard-to-abate sectors, through instruments such as carbon pricing, product standards and public procurement.

The EU is also a member of Mission Innovation, a global initiative of 25 countries dedicated to achieving the objectives of the Paris climate agreement through clean energy innovation and doubling public investment in this area within 5 years.

5. The social dimension and skills

With 330,000 jobs in the steel industry itself and many more indirectly induced, steel is as much a social and employment factor as an economic one. Experiences of deindustrialisation due to automation and foreign competition still weigh on many communities and regions centred around classical manufacturing industries. To avoid a repetition of such experiences in light of the new mega-trends of decarbonisation and digitalisation, European companies have to be ahead of the curve and workers have to be equipped with the right skills while enjoying adequate working conditions. Given the challenging business environment in the steel sector, the Commission will keep a close eye on developments, use the instruments at its disposal, and support Member States in anticipating and easing transitions⁵¹ with a view to minimising adverse social impacts.

Social dialogue

The steel sector has a long history of social dialogue at the European level. The Consultative Committee of the European Coal and Steel Community (ECSC), which existed between 1952 and 2002, convened producers, workers, consumers and dealers in the coal and steel sectors. After its expiry, a Sectoral Social Dialogue Committee for Steel was founded. In this framework, the European trade union federation IndustriAll Europe and the European Steel Association Eurofer, work together to represent the workers and employers in the steel sector. The SSDC's mission is to monitor the social, economic and employment consequences of EU policies on the steel sector and to represent the interests of social partners in the political process. For example, the SSDC has in recent years participated in the Commission's consultations on steel safeguards and anti-dumping and anti-subsidy cases, contributed to the "Masterplan for a competitive transformation of EU energy-intensive industries"⁵² and started analytical work on the potential impact of "Industry 4.0" on employment and skills in the steel sector.⁵³ As regards restructuring strategies, the importance of coupling them with strong re- and upskilling policies can be recalled. Considerable amounts of EU funding are available to address the adverse effect of the social impact of restructuring, with the main Union instrument being the European Social Fund (ESF).

Social dialogue would be key in transitioning towards clean and competitive European steel, to map-out the new skills needed by companies in the sector and support workers in acquiring them.

Skills

The Commission has put a "Pact for Skills" high on its European Skills Agenda.⁵⁴ The Agenda and its Pact for Skills respond to the first principle of the European Pillar of Social Rights and are anchored in the New Industrial Strategy. The Pact aims to mobilise public and private organisations to join forces so that they can take effective upskilling and reskilling actions for people of working age.

Steel companies, workers, national, regional and local authorities, social partners, industry organisations, vocational education and training providers, chambers of commerce and employment services should all play a key role in the Pact for Skills. Only by joining forces, making concrete commitments to invest in training for the workforce and building on the

⁵¹ with targeted policies and effective measures such as those set out in the Commission Recommendation on an effective active support to employment following the COVID-19 crisis (EASE)

⁵² <https://op.europa.eu/en/publication-detail/-/publication/be308ba7-14da-11ea-8c1f-01aa75ed71a1>

⁵³ https://news.industriall-europe.eu/content/documents/upload/2020/9/637350989319666309_Steel%20social%20partner%20work%20programme%202020_21.pdf

⁵⁴ COM/2020/274 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0274>

results of the ongoing Blueprint Skills Alliances,⁵⁵ can substantial progress be made towards meeting the industry's skills needs. To make sure that the Pact takes shape with the relevant partners, the Commission has begun a series of high-level discussions with representatives of industrial ecosystems, regional and national authorities, social partners and education and training providers.

Under the Digital Europe Programme, the Commission is supporting the reskilling and upskilling of workers through short-term courses in advanced digital skills. Furthermore, the SME strategy supports the 'digital volunteers' programme to promote the transfer of expertise in digitalisation from high-tech businesses to more traditional SMEs. The Covid-19 crisis has accelerated structural labour market trends, including digitalisation. Policies supporting workers in the steel industry in acquiring these relevant skills would help to ensure a job-rich recovery.

Regions in transition

The transition to a climate-neutral economy will have a significant economic and employment impact on regions with important carbon-intensive industries. However, the distributional impact on vulnerable groups and regions stemming from transitional policies could be alleviated by solidarity mechanisms, revenue recycling and financial measures.

The Just Transition Mechanism (JTM) seeks to leave no region behind in the context of the European Green Deal. It will mobilise up to EUR 100 billion in the next decade. As part of the JTM, the Just Transition Fund (JTF) will invest EUR 17.5 billion in the territories most negatively affected by the transition.

In the 2020 European Semester Country Reports, the Commission proposed the steel sector as one of the priorities of JTF support in six Member States.⁵⁶ The JTF can invest in economic diversification and reconversion, deployment of new technologies, upskilling and reskilling of workers, to overall support the decarbonisation of the industry.

The JTF complements investments from the European Regional Development Fund and the European Social Fund Plus to support a smart economic transformation and a more inclusive economy.

⁵⁵ Work on a skills Blueprint for the steel sector is ongoing: <https://www.estep.eu/essa/essa-project/>, https://skillspanorama.cedefop.europa.eu/en/useful_resources/blueprint-sectoral-cooperation-skills-steel

⁵⁶ Belgium (Hainaut), France (Bouches-du-Rhône, Nord), Italy (Taranto), Luxembourg (Esch-sur-Alzette), Slovakia (Košice) and Sweden (Upper Norrland)

6. Conclusion

The steel sector shows that this important part of the EU industrial landscape must transform itself in order to stay competitive, create quality jobs and a first mover advantage in terms of technological transformation. Many EU policies already support the transformation of the steel sector, other energy-intensive industries and manufacturing industry more generally. Other policies and EU funding are on their way, but may take time to become fully operational.

The EU steel sector faces a challenging period as it recovers from the economic impact of COVID-19, while confronting internal and external challenges. It will be important to ensure that this critical sector for so many parts of the EU economy remains strong and able to invest in transforming itself to become climate-neutral and circular, in line with the ambitions of the EU Industrial Strategy.

Document 4

This is document 4 referred to in the Appendix marked WCM/MAK/4 on the Rebuttal Proof of Evidence of Mark Kirkbride dated 31.08.2021 on behalf of West Cumbria Mining Ltd



Parliamentary questions

42k 9k

19 May 2021

E-002691/2021

[Question for written answer E-002691/2021 to the Commission](#)
[Rule 138](#)
[Izabela-Helena Kloc \(ECR\)](#)

Answer in writing

▶ **Subject:** The future of the EU steel value chain

According to the Iron and Steel Technology Roadmap, the International Energy Agency expects the energy transition of the steel sector to be partly carried out through the use of carbon capture, usage and storage technology. The expected demand for coking coal will therefore slowly decrease, but only up to a point. The fact that domestic EU production equates to around 25 % of the EU's total demand shows that the EU steel sector is currently highly dependent on imports from non-EU countries.

Coking coal is an indispensable raw material for steel and without it the transition to a climate-neutral economy would be impossible. The critical raw materials list, which is updated every three years, defines which raw materials are of high economic importance and pose a significant supply risk. Bearing that in mind, increasing domestic production of coking coal, a raw material used strictly in metallurgy, should be a priority.

However, coking coal seems to be a victim of nomenclature and general resentment for (thermal) coal, which translates directly into narrowing access to financing, both from the capital market and EU funds.

Is the Commission planning to take measures to address this situation or is the EU heading towards complete dependence on coking coal imports?

Last updated: 31 May 2021

[Legal notice](#) - [Privacy policy](#)



Parliamentary questions

34k 18k

3 August 2021

E-002691/2021(ASW)

Answer given by Mr Breton
on behalf of the European Commission

Question reference: [E-002691/2021](#)

The Commission recognises the indispensable role of coking coal during the steel industry's transition to climate neutrality. By-products of coking coal play also an important role in the production of battery electrodes, carbon fibres, hydrogen and many other chemicals.

The Commission is aware of the EU's high dependence on imports for this critical raw material. Coking coal has been on the EU list of Critical Raw Materials in 2014, 2017 and 2020, based on assessment of the supply risk and economic importance.

The EU's updated industrial strategy recalls the need to address strategic dependencies for the EU economy⁽¹⁾, including in the case of some raw materials, and reported on the actions being taken to increase resilience and sustainability under the EU action plan on critical raw materials⁽²⁾.

Global demand for critical raw materials will continue to grow in the coming years. The EU should mobilise its domestic potential for both primary and secondary raw materials.

The action plan encourages Member States to identify mining and processing projects, investment needs, and related financing opportunities for critical raw materials in the EU, giving priority to coal-mining regions. Furthermore, the Platform on Sustainable Finance, a Commission expert group, is working on developing criteria for the mining, extractive and processing sectors for the EU Taxonomy.

⁽¹⁾ COM(2021) 350 final and SWD(2021)352 final

⁽²⁾ COM (2020) 474 final

TOWN AND COUNTRY PLANNING ACT 1990

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015/595

TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES
2000/1624

PLANNING INQUIRY UNDER SECTION 77 OF THE TOWN AND COUNTRY PLANNING
ACT 1990 IN RELATION TO THE PLANNING APPLICATION REFERENCE 4/17/9007 FOR
APPLICATION FOR DEVELOPMENT OF A NEW UNDERGROUND METALLURGICAL
COAL MINE AND ASSOCIATED DEVELOPMENT TO BE LOCATED AT

FORMER MARCHON SITE, POW BECK VALLEY AND AREA FROM MARCHON SITE TO
ST BEES COAST, WHITEHAVEN, CUMBRIA

PINS REFERENCE: APP/H0900/V/21/3271069

WCM/PS/3

Rebuttal on matters relating to Ecology

Dr Peter Shepherd CIEEM

On behalf of West Cumbria Mining Ltd

August 2021

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1. Introduction

- 1.1. This Rebuttal Proof responds to a number of issues relating to the alleged restricted access for Dr Martin, inadequacies of the ES chapter in relation to the assessment of woodland habitats, inadequate in house ecological advice to Cumbria County Council, the presence of dingy skipper and hydrological impacts on woodland arising from the construction of the conveyor raised in the Proof of Evidence of Mr Bedwell [SLACC/PB/1] (including the appendix to this proof provided by Dr Martin) [SLACC/PB/2] of South Lakes Action on Climate Change ("SLACC").
- 1.2. This is not intended to be an exhaustive rebuttal and this document only deals with points where I consider it appropriate and helpful to respond in writing at this stage in order to assist with the timely progress of matters at the inquiry. This does not imply that anything contained in those reports is agreed if it is not specifically rebutted. Other points at issue will be dealt with in evidence at the Inquiry.

2. Rebuttal of Evidence of Mr Bedwell

Restricted Access for Dr Martin

- 2.1. Mr Bedwell states in his Proof of Evidence (page 32, paragraph 7.4) that Dr Martin was not granted access to the application site to conduct surveys until the 23 June 2021 and was restricted to the woodland areas affected by the conveyor and accompanied and, as such, suggests his visit was constrained.
- 2.2. I was not involved in the arrangements relating to the date of the site visit but understand that the landowners of the areas Dr Martin wished to visit had reservations about granting access to third parties and this issue had to be resolved before access to all the areas Dr Martin wished to visit could be granted. I understand a summary of the access arrangements is provided as at Appendix 1 to Mr Thistlethwaite's rebuttal to Mr Bedwell's proof [WCM/ST/4].
- 2.3. The site visit was attended by myself and Mr Kevin Murphy of West Cumbria Mining. Prior to the visit, Dr Martin stipulated in an email dated 22nd June (included at Appendix 1 of this proof - WCM/PS/4) his overall aim, the areas he wished to visit, the reason for the early time of the visit and his requirements of those accompanying him.
- 2.4. Contrary to the suggestion made by Mr Bedwell, Dr Martin was not restricted to the woodland areas during his site visit. He also walked the conveyor route between Bellhouse Woodland and Roska Park Wood and walked the Main Mine Site. During the site visit Dr Martin was asked if we wished to access any other areas, including the conveyor route between the Main Mine Site and Roska Park Wood, the conveyor route between Bellhouse Wood and the Rail Loading Facility, the Rail Loading Facility and the Main Band Colliery site. Dr Martin declined the invitations and stuck to the areas he identified in his email of the 22nd June 2021. As requested, Dr Martin he was left to inspect Bellhouse Wood, Roska Park Wood and Benhow Wood unaccompanied. Dr Martin did not request to be unaccompanied at the Main Mine Site. Once the walkover of the Main Mine Site was completed Dr Martin was left to complete his site visit using public rights of way, as he suggested in his email of 22nd June. I am not aware of the specific additional areas Dr Martin visited once the accompanied part of the visit had finished.

- 2.5. As such, Dr Martin was given every opportunity to visit whatever areas he wanted and was asked specifically if he wanted to visit other areas of the red line area which he declined. Accordingly, I cannot agree with the suggestion that Dr Martin's site visit was restricted on the day.
- 2.6. I note that in his email of 22nd June, Dr Martin stipulated that the purpose of the visit was: "*Our aim, of course, is to get data that is reasonably comparable to that collected by BSG*". I consider this to be an unrealistically ambitious aim for a single site given that the data collected by BSG was gathered over a full survey season and, for some survey data, over more than one season.

Inadequacies of the ES chapter on Ecology in relation to impacts on woodland

- 2.7. Mr Bedwell asserts (page 33, para 7.7) that the impacts on the woodland sites (Roska Park Wood, Benhow Wood and Bellhouse Wood) identified by Cumbria County Council are likely to be higher than those identified in the Council's assessment. Specifically, Mr Bedwell references the status of the woods as ancient woodland and a lack of sufficient data to reliably assess the conservation value of the woodlands. In drawing this conclusion Mr Bedwell refers to the letter prepared by Dr Martin, which is produced at Appendix 4 to Mr Bedwell's proof of evidence. The specific issues raised by Dr Martin regarding survey relate to woodland flora, bats and breeding birds.
- 2.8. The ES recognises the three woodlands are of nature conservation importance due to their designation as a Wildlife Site and reports that Bellhouse Wood is listed as ancient woodland. As such, the Council were aware of the importance of these woodlands and the reasons for their designation. Dr Martin argues that Roska Park Wood and Benhow Wood have characteristics of ancient woodland, and therefore should be considered as ancient wood in planning terms.
- 2.9. Ancient woodland in England is any area that has been wooded continuously since at least 1600 AD¹ and often supports ancient semi-natural woodland mainly made up of trees and shrubs native to the site, usually arising from natural regeneration. Ancient woodland also includes plantations on ancient woodland sites (replanted with conifer or broadleaved trees) that retain ancient woodland features, such as undisturbed soil, ground flora and fungi. Areas that have been excavated or where there has been a change in land use since 1600 AD are not classified as ancient woodland as the continuity of land use has been broken.
- 2.10. Whilst I agree parts of the ground flora in Roska Park Wood and Benhow Wood support plants associated with ancient woodland, indicating a long continuous woodland cover, I do not agree that all parts of these woods qualify as ancient woodland due to the past land use. Indeed this may well also explain why they are not identified as ancient woodland and included in the ancient woodland inventory. Both Roska Park Wood and Benhow Wood either side of the St Bees Road has been subject to historical industrial activity including quarrying and lime production in lime kilns. This past use is identified in chapter 16 (Table 16.5 and Figure 16.3) of the ES, which identifies this area as site 53 and the evidence of historical industrial activity can be seen within the areas of the woodlands affected. I have provided in Appendix 2 [WCM/PS/4] a historical map (1864-1895) showing the reduced area of woodland cover at this time at both Roska Park Wood and Benhow Wood compared to the current day and the presence of industrial

¹ See e.g. <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#ancient-woodland>

activity either side of St Bees Road. As such, I do not consider the affected parts of the woodland can be classified as ancient woodland.

- 2.11. In support of his argument that the Council were not aware of the conservation value of the woodlands, Dr Martin (Appendix 4, page 34, paras 4.1, 4.2 and 4.3 to Mr Bedwell's proof) says the botanical survey of the woodlands was inadequate. The areas of woodland affected by the conveyor route were surveyed on the 11th April and 22nd May 2017. These visits, in particular the one in May, were specifically undertaken to assess the ground flora within the woodlands at the locations where the conveyor crosses the woodlands. Habitat descriptions are set out in the Ecology chapter sections 11.7.66 – 11.7.78. Given the small area of woodland affected at each location I consider this level of survey was adequate to properly inform the impact assessment. In addition, two visits by the ecological advisors to the Council were undertaken. The first visit was on the 9th November 2016 and looked at the Main Mine Site and the conveyor route. The second visit took place on the 15th March 2017 and is described in the ES as being 'specially to look at the two woodland sections' and to consider the scope of baseline survey, assessment and impacts. As such, I consider the Council was, and the Inspector and Secretary of State are, properly informed as to the value of the woodlands and their botanical interest.
- 2.12. Dr Martin (Appendix 4 page 34, para 4.4 of Mr Bedwell's proof [SLACC/PB/2]) also suggests that the value of the woodlands for bats was not properly assessed as the bat survey did not follow the bat survey guidelines published by the Bat Conservation Trust (2016)². Section 1.1.3 of the bat survey guidelines acknowledges that it is not always appropriate to apply the proposed methods and survey effort set out in the guidance to all situations and that at times professional judgement as to the most appropriate survey approach will need to be deployed. In this case I consider the level of survey effort and the approach to the survey was proportionate to the predicted scale of impact (loss of a small area (>1%) of woodland area). The key potential impact of the construction of the conveyor on bats using the cut and cover option is the potential loss of tree roosts. Tree roost assessments were undertaken and, in the case of Bellhouse Gill, an additional emergence survey was carried out. No roosts were confirmed. In terms of the value of woodlands for foraging and as a flightpath, I consider the extent of habitat loss to be negligible in terms of loss of foraging habitat and do not consider the gap that will be created in the woodland canopy cover will sever flight paths. As such, I reject the assertion that the relative value of the woodlands for bats or the scale of impact of the proposed development was underestimated in the ES.
- 2.13. Finally, Dr Martin (Appendix 4, page 34, para 4.5 [SLACC/PB/2]) implies that the bird survey of the woodlands was inadequate because he had an expectation that more species would have been recorded. In support of this Dr Martin refers to recordings of bird song he made during his site visit on the 22nd June. This is not an accepted breeding bird survey methodology and is not supported by observations of bird behaviour that would determine if a bird were likely to be breeding and if so in what location. As such, it does not compare to the results of surveys undertaken over three survey visits carried out following industry standard approach, by competent ornithologists. As such, there is no empirical basis to suggest that the conservation value of the woodlands has been underestimated.

² Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd Edition). Collins, J. (2016). The Bat Conservation Trust.

- 2.14. Dr Martin considers (Appendix 4, page 37, para 14 [SLACC/PB/2]) that the assessment of impacts on the woodlands (assessed as being of County importance) is inadequate and should have been greater than the significance level set out in the ES which is an impact of significance at the Local geographical scale. The assessment of significance of impact has been undertaken using the guidance set out by CIEEM³. The guidance deals with significance and indicates that the significance of an impact can be determined at different geographical scales. It does not automatically follow that an impact on a feature of a particular value results in an equivalent level of significance of impact. In this case the assessment of significance of the impact on the woodlands is based upon the small area of woodland that would be lost using the cut and fill method (> 1% for both woodlands). Given the small scale of loss I consider it is appropriate for the level of significance to be assessed as being at a lower level than the value afforded to the woodlands.

Inadequate ecological advice available to Cumbria County Council

- 2.15. Dr Martin (Appendix 4, page 33, para 3 [SLACC/PB/2]) seeks to suggest that Cumbria County Council was in some way disadvantaged in its assessment of the application as it did not have an in-house ecological advisor and, as such, was not provided with adequate advice on ecological impacts.
- 2.16. Throughout the application process the Council retained the services of the large multi-disciplinary specialist consultancy, WYG⁴, who advised on ecological matters. The lead consultant advising the Council was a highly experienced principal consultant with over 30 years' professional consultancy experience. There were also joint site visits to consider specific issues, such as impacts on the woodlands by the conveyor route. In addition, the ES was reviewed by Penny Simpson at Freeths⁵, a specialist in environmental law. As such, I consider that the Council was advised by highly experienced ecological and environmental legal professionals and as a result was not disadvantaged by an inadequacy of expert advice. In addition to the advice provided by WYG and Freeths, the Council also took into account representations by third parties. Section 1.3 of the ecology chapter of the ES details the consultations undertaken and, as such, clearly sets out the level of expertise available.

Dingy Skipper

- 2.17. Dr Martin (Appendix 4, page 34, para 4.6 [SLACC/PB/2]) raises the possibility that the Main Mine Site may support the dingy skipper butterfly and that its presence cannot be discounted on the basis of the invertebrate survey work undertaken to inform the ES. I accept that the first survey on 28 June 2016 was at the end of the flight period for this species, even considering the northern location of the site, and as such a negative result cannot be relied upon to rule out its presence. However, reliance can be placed upon the update survey in 2021 which did include surveys in the optimal flight period and dingy skipper has not been recorded. Furthermore, even if present, the main food plant of bird's-foot trefoil will remain on the adjacent areas of landfill and can be readily included in landscape proposals secured by condition and, as such, would continue to provide habitat for this species.

³ Guidelines for Ecological Impact assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. 2018 (CIEEM)

⁴ Now part of Tetra Tech.

⁵ <https://www.freeths.co.uk/people/penny-simpson/>

Hydrological impacts of the conveyor

- 2.18. Dr Martin (Appendix 4, page 38, para 17 appended to Mr Bedwell's proof [SLACC/PB/2]) raises a concern that both the cut and cover option considered by the ES and the directional drilling (pipe jacking) now proposed will be a major engineering operation with a high risk of changing the drainage over a large area of ground, which may affect areas of woodland where little survey work has been undertaken and which support ancient woodland indicator species.
- 2.19. Dr Martin does not refer to chapter 12 of the ES, which considers hydrological impacts of the cut and cover option to install the conveyor. It does not identify a significant impact on hydrology, as suggested by Dr Martin, and concludes no significant impacts on hydrology would arise. As such, I do not consider there is a need for wider ecological survey and assessment as asserted by Dr Martin.
- 2.20. Nevertheless, in order to ensure that the pipe jacking technique that is now proposed to avoid the need to dig up the gill woodland habitat in Roska Park Wood and Bellhouse Wood, would not have any additional potential ecological impacts, I have been appraised on the possible ways the pipejacking technique might affect water supply and water quality in the gill woodlands. The project hydrologist, Mr Barnaby Harding, has summarised his advice in a technical note set out in Appendix 3 [WCM/PS/4]. The note considers worse case scenarios, such as if the pipejacking were to interact with a local perched water table or a conduit flow route through geological strata, and the possible ways water flow may be affected. He has also considered proposed mitigation measures that can be put in place to ensure continued flow of water should either of these two worse case scenarios be encountered. Mr Harding also addresses Dr Martin's claim that the construction process would result in a major change in hydrology over a large area. Given the advice from Mr Harding, I do not consider that the construction of the conveyor and pipejacking would result in a loss of flow to the watercourses in the woodlands or that it would adversely affect water quality. As such, I do not consider there is likely to be a significant impact on the ecology of the woodland from the proposed pipe jacking methodology.

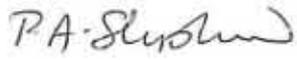
Biodiversity Net Gain

- 2.21. Dr Martin (Appendix 4, page 40, para 22.5 appended to Mr Bedwell's proof [SLACC/PB/2]) comments that using a biodiversity metric would be a useful method of identifying the ability of the scheme to deliver a biodiversity net gain.
- 2.22. I agree that this would be the best way of measuring if a biodiversity gain can be achieved by the scheme and, if so, the extent of the gain. Such a calculation has been made using the latest version of the DEFRA Biodiversity Metric (V3.0). It has been based on a range of reasonable assumptions about the final detailed restoration plan which have been agreed in discussion with West Cumbria Mining. The calculations within the metric have been based on a precautionary approach to the target condition of proposed habitats to be retained, restored or created.
- 2.23. As the calculation is based on outline restoration proposals and reasonable assumptions as to what the final restoration plan will include, it is not a final definitive calculation. That can only be completed once the final restoration plans have been agreed with the Council through discharge of draft condition 46. However, what is included in the metric calculation is eminently deliverable. Also, as stated in draft

condition 46, achieving a biodiversity net gain is a key requirement of the restoration plans and will be a major driver in the design of the final plans.

3. Conclusion

- 3.1. I have considered Mr Bedwell's proof of evidence as far as it relates to ecological matters and the letter from Dr Martin, which is produced at Appendix 4 to Mr Bedwell's proof of evidence. I have set out my response to the points raised in this rebuttal proof.
- 3.2. I do not agree with the assertion by Mr Bedwell that Dr Martin was restricted in the areas of the site he wished to visit during his site visit on the 22nd June. Dr Martin was given free access to all of the areas he requested access to.
- 3.3. In relation to inadequacies of the Environmental Statement (ES) I do not agree with the assertion that the woodlands were undervalued in the Ecology chapter or that in determining the application Cumbria County Council were not aware of the value of the woodlands or were in some way disadvantaged by an absence of an in-house ecological adviser. I also disagree with the assertion that the proposed construction of the conveyor will result in large scale hydrological changes that would affect a wider area than that assessed in the ES, and I consider the pipe jacking method of construction now proposed will not have an adverse effect on the hydrology of the gill woodlands.
- 3.4. I accept the first invertebrate survey did not include the main flight period for Dingy Skipper butterfly. However the survey in 2021 did cover this period and as a result the inspector and Secretary of State, can have confidence in the absence of this species from the site.
- 3.5. I consider given the biodiversity net gain calculation that has been completed that the proposal is likely to deliver a biodiversity gain.

SIGNED: 

DATE: 31st August 2021

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order 2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation To

The Planning Application Reference 4/17/9007 For Application For Development Of A New

Underground Metallurgical Coal Mine And Associated Development To Be Located At

Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

APPENDIX – WCM/PS/4

This is the Appendix marked WCM/PS/4 referred to in the Rebuttal Proof of Evidence of Peter Shepherd dated 31.08.2021 on behalf of West Cumbria Mining Ltd

1.	Appendix 1 - E-mail from Dr Martin regarding his requirements for access dated 22.06.2021	1
2.	Appendix 2 – Historical Map of Roska Park and Benhow Woods	3
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Document 1

This is document 1 referred to in the Appendix marked WCM/PS/4 on the Rebuttal Proof of Evidence of Dr Peter Shepherd dated 31.08.2021 on behalf of West Cumbria Mining Ltd

Appendix 1 - E-mail from Dr Martin regarding his requirements for access 22/06/21

From: Tony Martin <tony.martin@e3ecology.co.uk>

Sent: 22 June 2021 11:30

To: Peter Shepherd <p.shepherd@bsg-ecology.com>; Kevin Murphy <kevin.murphy@westcumbriamining.com>

Cc: Maggie Mason <maggiem.mason@gmail.com>

Subject: Re: Land Access

Dear Peter/Kevin

Happy with that as a meeting point. The weather is not looking ideal for tomorrow, but not poor enough at present to look to reschedule.

Our aim, of course, is to get data that is reasonably comparable to that collected by BSG, and I agree that we should seek to avoid disturbing nearby residents. My focus is however Bellhouse Wood and the reason for the early start is to try and get an initial assessment of fauna which will not be achieved with a group of three. I would therefore propose to start there and suggest that you wait in a location which can provide over-sight without disturbance. Given the small size of the area affected I would not expect to need much more than 1hr of quiet working and we could then have a walk over together if there are issues and areas which you wish to point out.

It would be helpful to look at Roska wood and perhaps we could do that next. I am less concerned about disturbance in this area. I note that there is an outlying part of Benhow woodland within the redline boundary and it would be useful to look at this area and understand what is proposed there.

Kevin, if you have a plan of land that you have access to it would be helpful to see that today to see what else we could fit in.

I would suggest looking at the brownfield land after breakfast, say around 11am when it looks to be drying up, and some pointers on what would be going where would be most helpful as such sites can be quite disorientating.

Finally if there are any plans of proposed biodiversity compensation land which are likely to be provided to the inspector it would be helpful to see those so that I can get a handle on current habitats in those areas.

My other work can be undertaken from the road and footpath network.

Thank you for your assistance

kind regards

Tony

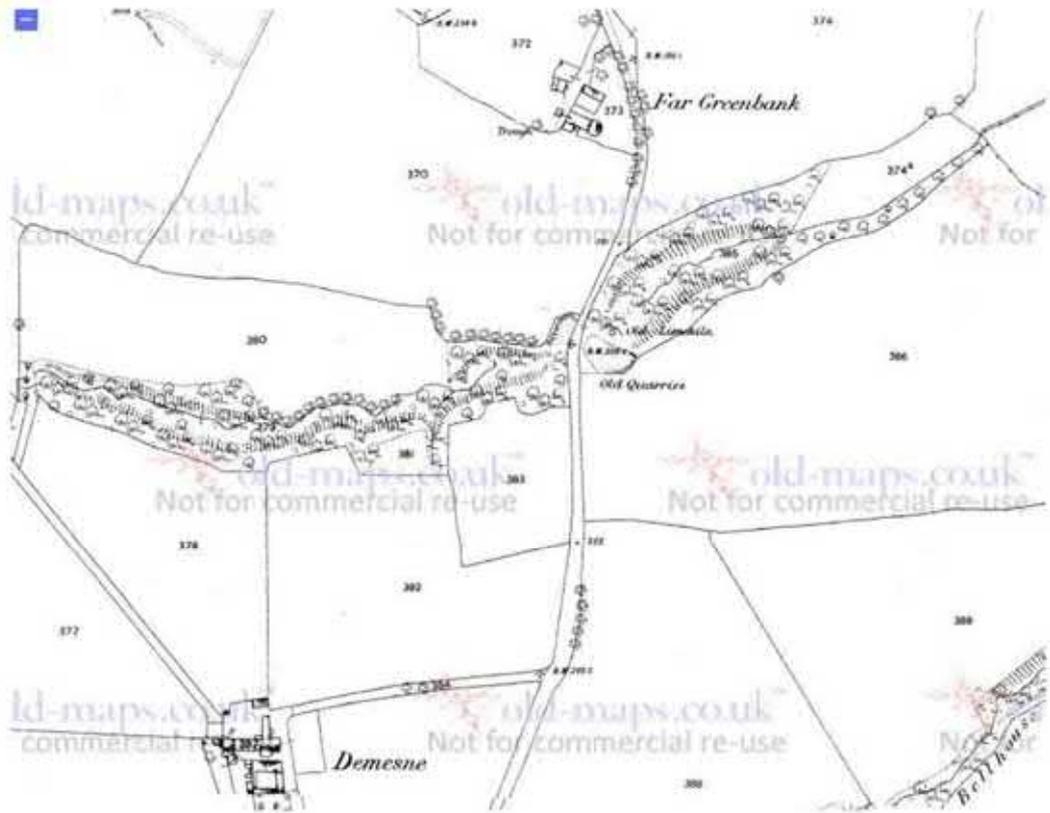
wh32648534v1

Document 2

This is document 2 referred to in the Appendix marked WCM/PS/4 on the Rebuttal Proof of Evidence of Dr Peter Shepherd dated 31.08.2021 on behalf of West Cumbria Mining Ltd

Appendix 2 – Historical Map of Roska Park and Benhow Woods

1864 - 1895 Map



Document 3

This is document 3 referred to in the Appendix marked WCM/PS/4 on the Rebuttal Proof of Evidence of Dr Peter Shepherd dated 31.08.2021 on behalf of West Cumbria Mining Ltd

HARDING HYDRO

68 Larkhill Road
Shrewsbury
SY3 8XJ

Tel: 07973635589

email: barnaby@hardinghydro.co.uk

Peter Shepherd
BSG Ecology
Worton Park
Worton
Witney
Oxfordshire
OX29 4SX

31 August 2021

Our ref: 10003-L001Rev01

Dear Peter,

Former Marchon Site, Pow Beck Valley and area from Marchon Site to St Bees Coast, Whitehaven, Cumbria - Application for development of a new underground metallurgical coal mine to include a buried conveyor at Roska Park and Bellhouse Gill Woods and associated development ("the Proposal"): Illustration of potential impacts and mitigation

Please find below a summary of the potential issues that could occur as a result of the pipe-jacking "Trenchless Construction" method to be deployed at the above site in relation to the Proposal, and my findings on the mitigation principles for any potentially likely hydrogeological impact of those works. You will see from the letter attached from Mark McGeady (of The Joseph Gallagher Group) that in engineering terms he is satisfied that the principles of mitigation proposed in my note can be applied in practice.

You will note from the text and diagrams attached to this letter that I have taken a conservative approach to what might be encountered by way of existing ground conditions and have dealt with a number of speculative scenarios even though, in reality, there may be a good chance that there will be no issues at all. Based on my assessment and Mr McGeady's response, I am satisfied therefore that measures can be implemented as part of the proposed trenchless construction methodology to ensure that the pre-construction hydrogeological conditions will not be significantly impacted by the works, by which I mean that they will not result in:

1. the permanent or temporary loss of flow in the watercourse;
2. a pollution event; or
3. a sediment release that cannot be managed through standard control measures.

To further reduce the risks associated with the proposed construction, I would also recommend that construction is preferentially undertaken during periods when low or no flow might be expected in the gills.

In addition, I have had sight of a letter from Dr A D Martin of E3 Ecology dated 9 August 2021 addressed to a Maggie Mason of "South Lakes Action on Climate Change". I note from paragraph 17 of that letter that it is stated there is a "high risk of changing the drainage over a large area of ground, particularly downstream of the conveyor". In response to that statement I would comment as follows:

31 August 2021

Confidential

1

Whilst I acknowledge that the construction and presence of the proposed conveyor will have some effect on drainage and, potentially, groundwater flow, the important question is the degree, extent, and significance of the impact. The conveyor will be constructed approximately 2 m below the ground surface and, if located in the unsaturated zone (Scenario 1 in the attached assessment), the impact of this on vertical drainage and groundwater flow would be, in all likelihood, highly localised and insignificant. Downstream impacts would, in my opinion, be negligible and most likely imperceptible. The risk of significant impact is increased if the conveyor is constructed below the water table, but even under these conditions my opinion is that the circumstances where the impact would not be significant are far more likely than those where it would. Even under the less likely situation where impacts are significant, I believe that mitigation could be employed to reduce them to insignificant levels. I infer from Dr Martin's comments quoted above that he considers that the impacts are likely to be widespread and significant; I do not agree with this assessment and believe that the impacts are more likely to be localised and insignificant and, if ground conditions are encountered that may suggest otherwise, mitigable.

Yours sincerely

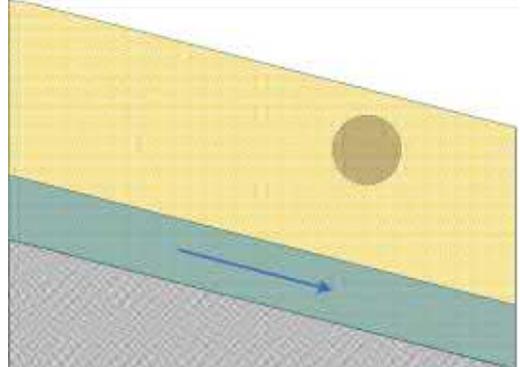
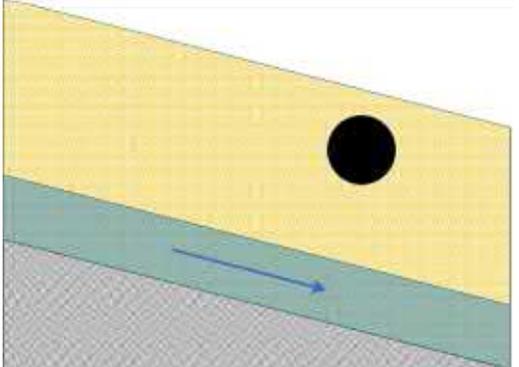


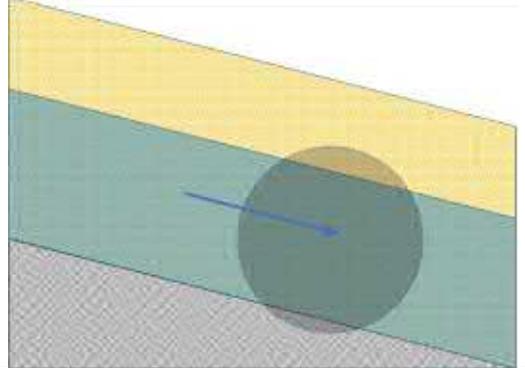
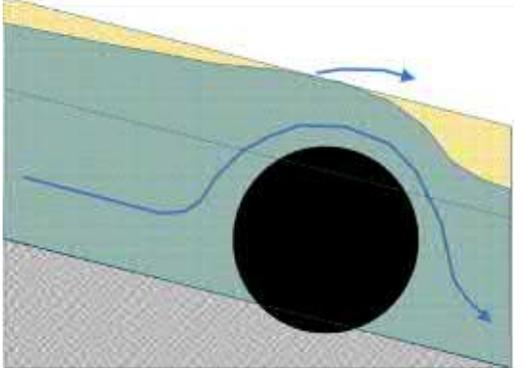
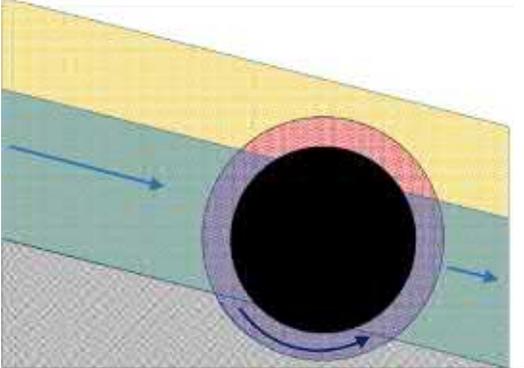
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DIRECTOR

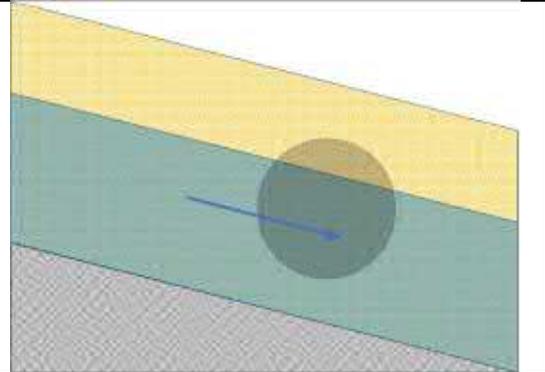
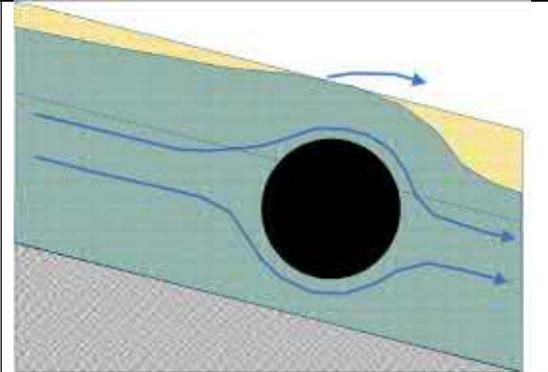
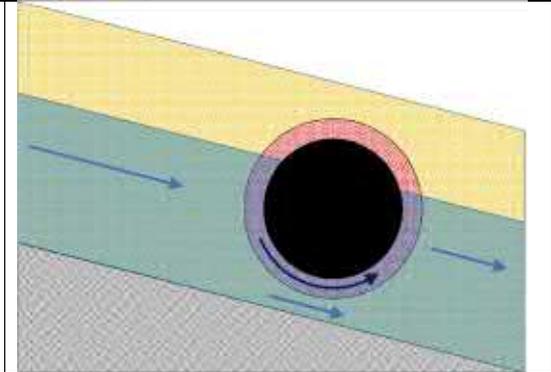
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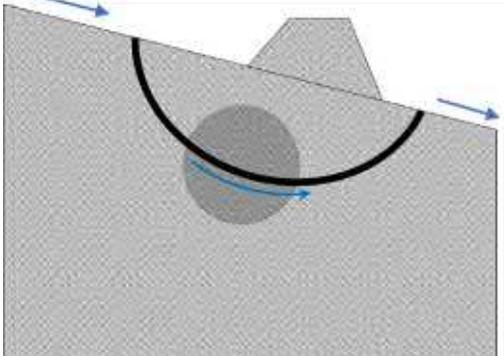
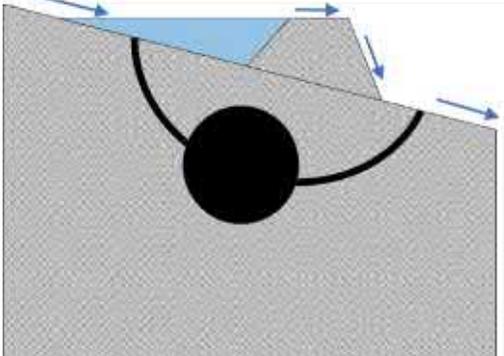
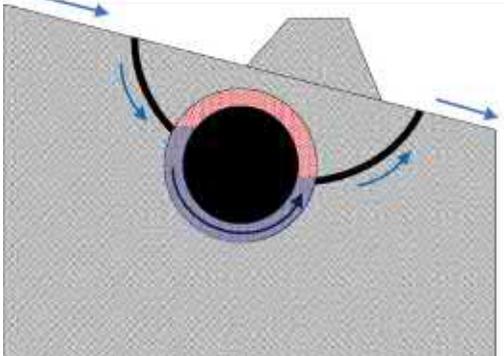
MITIGATION OF HYDROGEOLOGICAL IMPACTS OF PROPOSED TRENCHLESS CONSTRUCTION AT ROSKA PARK AND BELLHOUSE GILL WOODS

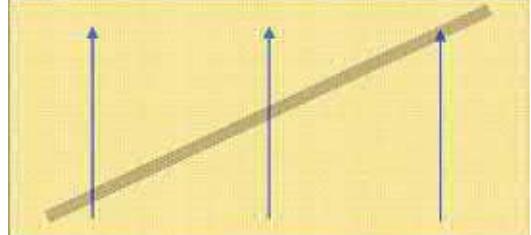
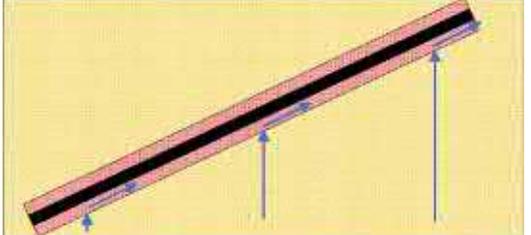
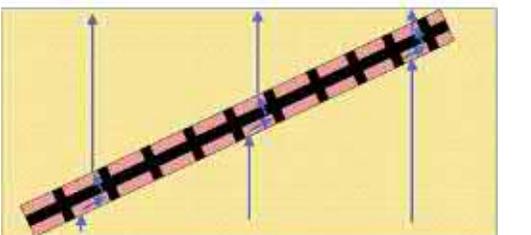
Scenario 1: Tunnel above water table		
Pre-construction Conditions	Potential Post-construction Issue	Potential Mitigation
		None required.
<p>Water table (perched or regional) is located below tunnel invert.</p> <p>Based on currently available information this is likely to be the case if the tunnel is excavated through fill in Zone 1 and could be the case if the tunnel is excavated through solid geology and groundwater is deeper in Zone 1 and Zone 2.</p>	None likely. Tunnel will be located in the unsaturated zone and will not impact on groundwater flows.	None required.

Scenario 2: Tunnel below water table (fully blocking)		
Pre-construction Conditions	Potential Post-construction Issue	Potential Mitigation
		
<p>Pre-construction conditions as per Scenario 1 except that proposed tunnel would be partly or fully below the water table and occupy the full thickness of the unsaturated zone.</p> <p>This could be the case at Zone 1 and Zone 2.</p>	<p>Tunnel acts as impermeable block within aquifer and impedes groundwater flow. Groundwater will back up upgradient of the tunnel until it reaches a sufficient height to flow over the obstruction. If groundwater reaches the surface, waterlogging and groundwater breakout may occur. Dropping of downgradient groundwater levels less likely as total flow across the obstruction will ultimately remain unchanged unless there is a large amount of surface discharge.</p>	<p>Provide permeable pathway below tunnel. Water can continue to flow beneath the tunnel unimpeded and hence will not back up. Pathway could take the form of a jacket around the structure or a number of drains going beneath it, connecting the aquifer on the upgradient and downgradient sides.</p>

Scenario 3: Tunnel below water table (partly blocking)

Pre-construction Conditions	Potential Post-construction Issue	Potential Mitigation
		
<p>Pre-construction conditions as per Scenario 1 except that proposed tunnel would be partly or fully below the water table but would not occupy the full thickness of the saturated zone.</p> <p>This could be the case at Zone 1 and Zone 2.</p>	<p>Tunnel acts as impermeable block within part of the aquifer and impedes groundwater, but not completely.</p> <p>Groundwater will back up upgradient of the tunnel until it reaches a sufficient height to reinstate pre-existing flow under (and possibly over) the obstruction. The degree to which this will occur will depend on the proportion of the saturated thickness which is blocked, the pre-existing groundwater gradient, and the width of the tunnel.</p> <p>For the proposed construction it is likely that a significant proportion of the saturated thickness would need to be blocked to result in a large increase in upgradient groundwater levels. As an example, for an initial saturated thickness of 4 m which is then reduced to 1 m (reduction to 25% of original thickness) at the location of the tunnel, a tunnel width of 5 m, and a pre-existing groundwater gradient of 1 in 50, the rise in upgradient water levels would be of the order of 0.3 m. If the saturated thickness is reduced to 0.4 m (10% of original thickness) the upgradient rise would be around 0.9 m.</p>	<p>Provide permeable pathway below tunnel as per Scenario 2 if upgradient rise is unacceptable.</p>

	<p>Whilst less likely than in the fully blocking scenario, if groundwater reaches the surface, waterlogging and groundwater breakout may occur. Dropping of downgradient groundwater levels less likely as total flow across the obstruction will ultimately remain unchanged unless there is a large amount of surface discharge.</p>	
<p>Scenario 4: Tunnel blocks discrete drainage feature</p>		
Initial Conditions	Potential Post-construction Issue	Potential Mitigation
		
<p>Presence of a discrete drainage feature which is performing a significant drainage function such as a fissure or man-made culvert.</p> <p>Proposed tunnel could intercept and block this feature.</p> <p>Fissures and a culvert are known to be present at Zone 1 and could be intercepted depending on the vertical alignment of the tunnel. No indication of such features at Zone 2 although their presence cannot be ruled out.</p>	<p>Depending on the importance of the feature being blocked on conveying surface water or groundwater flows, water could back up behind the tunnel and break out at surface or cause waterlogging. Water levels would continue to rise until they found a new route capable of conveying the flows. This could be a surface overspill or a higher-level, below-ground fissure which had not been blocked.</p> <p>Dropping of downgradient groundwater levels less likely as total flow across the obstruction will ultimately remain unchanged.</p>	<p>As per Scenarios 2 and 3.</p>

Scenario 5: Permeable pathway along tunnel diverts groundwater flows		
Initial Conditions	Potential Post-construction Issue	Potential Mitigation
 <p>As per Scenarios 2 and 3 (and possibly, but less likely, 4). Permeable pathway along tunnel alignment could occur at Zone 1 or 2 as a result of inadequate grouting of the annulus between tunnel and ground or through employment of the mitigation measures described in previous scenarios.</p>	 <p>A permeable pathway resulting from tunnel construction and along its alignment could divert groundwater and lead to downgradient falls in groundwater level in some areas and rises in others.</p>	 <p>Ensure that annulus between tunnel and ground is adequately grouted and, where permeable pathway mitigation (as described in previous scenarios) has been employed, ensure that this alternates with grouted, impermeable zones to prevent a continuous pathway along the tunnel length.</p>

Harding Hydro
68 Larkhill Road
Shrewsbury
Shropshire
SY3 8XJ

Date: 23rd August 2021

Our Ref: C600-MM-001

By Email: barnaby@hardinghydro.co.uk

RE: Former Marchon Site, Pow Beck Valley and area from Marchon Site to St Bees Coast, Whitehaven, Cumbria

Application for development of a new underground metallurgical coal mine to include a buried conveyor at Roska Park and Bellhouse Gill Woods and associated development ("the Proposal")

Illustration of potential impacts and mitigation

Dear Barnaby

As you are aware the Joseph Gallagher Group are one of the UK's leading civil engineering and tunnelling contractors, offering a wide range of construction and specialist services. Pipe Jacking ("Trenchless Construction") is a method of tunnelling that we have a wealth of knowledge and experience in and we are well versed in offering integrated design solutions that can cater for a range of existing ground conditions.

In this regard I have had sight of your proposed means of mitigating a range of hydrogeological impacts that may be encountered as a result of the proposed trenchless construction at Roska Park and Bellhouse Gill Woods, and I am satisfied that in practice a range of solutions will be entirely feasible and available to us to create a permeable layer as you have identified in your note.

Yours faithfully



Mark McGeady
Contracts Director
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Former Marchon Site, Pow Beck Valley
and area from Marchon Site to St Bees Coast,
Whitehaven, Cumbria

Rebuttal Proof of Evidence of Samuel
Thistlethwaite

West Cumbria Mining Limited
(Applicant)

Section 77 Public Inquiry following Call in direction from Secretary of State for Housing,
Communities and Local Government

Cumbria County Council application reference: 4/17/9007

Application for development of a new underground metallurgical coal mine and associated
development

Planning Inspectorate Reference: APP/H0900/V/21/3271069

August 2021

Former Marchon Site, Pow Beck Valley and area from Marchon Site to
St Bees Coast, Whitehaven, Cumbria

Rebuttal Proof of Evidence of Samuel Thistlethwaite

Prepared on Behalf of West Cumbria Mining Ltd (Applicant)

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Tel: 0191 605 3500
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Ref: 32920/A5/ST
Date: 31 August 2021

Date of Inquiry	7 th of September 2021
Venue:	Remote virtual
Inspector:	Stephen Normington
Planning Inspectorate Ref:	APP/H0900/V/21/3271069
Local Authority Ref:	4/17/9007

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Introduction

- 1.1 This rebuttal proof of evidence primarily addresses some of the matters raised in the proof of evidence of Mr Paul Bedwell MRTPI [SLACC/PB/1] which was submitted to the inquiry on the 10 August 2021.
- 1.2 This rebuttal is not intended to be a response to every point of disagreement between Mr Bedwell's proof and the WCM case.
- 1.3 Mr Bedwell's proof predominantly relies upon the conclusions of other witnesses providing their own technical evidence. As such some of the points of rebuttal highlighted within this submission will be applicable to the evidence given by other witnesses. Where this is the case the relevant original author of the matter being rebutted is highlighted.
- 1.4 As a further point of clarity, Mr Bedwell relies upon the proofs of evidence produced by witnesses appearing on behalf of Friends of the Earth, as well as his own instructing Rule 6 Party, SLACC.
- 1.5 The main matters addressed within this rebuttal relate to the following topics:
 - Contamination present on the Marchon site and the Hut Bank Landfill;
 - Coastal Change (as a result of global climate change);
 - Complaints regarding access to the site to conduct ecology surveys;
 - Ecology policy interpretations;
 - Local employment benefits; and
 - Tourism impact;

Contamination at Marchon site and Hut Bank Landfill and associated risk to controlled waters.

- 1.6 In the section of Mr Bedwell's proof of evidence that addresses Environmental Impacts, between paragraphs 7.24 and 7.37, he raises a number of matters in relation to the existing contamination found on the MMS (the former Marchon works). He notes the levels of residual contamination below ground at the Marchon site and the likely contamination present in the toe of the Hutbank Landfill.
- 1.7 In concluding on this point Mr Bedwell concedes in paragraph 7.37 of his proof that the risks associated with the remediation of the site and its construction phase can be adequately

controlled through the use of conditions proposed to date, and that no significant environmental harm can be attributed to the remediation of the Marchon site as proposed as part of the WCM scheme.

- 1.8 On the basis of the above, Mr Bedwell confirms that in respect of the remediation risk, that WCM proposals are in total accordance with Paragraph 217 of the NPPF, as well as Policy DC13, the main overarching policy that address coal extraction at the national and local levels. It is therefore not entirely clear what the relevance of the issues raised by Mr Bedwell are. Nevertheless, I will respond to them for the sake of completeness.
- 1.9 In respect of the Hutbank Landfill, the "toe" of the landfill may need to be excavated as part of one of the drift entrances. This element of the proposal has been clearly set out in the application process and discussed in detail with the Environment Agency which has resulted in the imposition of Condition 40 [SoCG], regarding the need to submit a Landfill Safeguarding Scheme. A copy of the relevant EA correspondence on this matter is included in Appendix 3 of this Proof [WCM/ST/4].
- 1.10 At paragraph 7.30 Mr Bedwell states that he considers *"that it is clear that the site does not require further remediation to be used as public open space"*. This is a view that I do not support.
- 1.11 The Marchon site has been allocated for built development for over 20 years both within the existing and previously adopted Copeland Local Plans. The Marchon site has never been allocated as a public open space. The Marchon site in its current form has been noted by Cumbria County Council as being a detraction to its immediate surroundings and that its development as part of the WCM proposals would provide a more pleasant place for people to live and work [CD4.5 paragraph 7.331].
- 1.12 The above-mentioned claim made by Mr Bedwell should be read in the context of the of the NPPF definition of "Open Space" (Appendix 2 of the NPPF), which states that Open Space is defined as:

All open space of public value, including not just land, but also areas of water (such as rivers, canals, lakes and reservoirs) which offer important opportunities for sport and recreation and can act as a visual amenity.
- 1.13 Based upon this definition, the Marchon site in its current form would fail to meet this definition as there are no formal opportunities for sport or recreation to take place. The numerous remaining structures would need to be removed or further remediated and a soil profile imported to create any usable sporting and recreational facilities (e.g., playing fields, play areas, walking routes, areas vegetation planting) that would have any public value.

- 1.14 Also, as noted above, in the view previously held by the Mineral Planning Authority [CD4.5 paragraph 7.331] the site's redevelopment from its current state would improve the visual amenity of those who live near to and would use the site. This is also a view shared by Mr Flannery [WCM/JF/1].
- 1.15 Accordingly, I do not accept that further remediation work would not be required to allow the site to be used as public open space. I believe the above-mentioned point will be apparent to the Inspector when he undertakes his site visits as part of the Public Inquiry process.

Coastal change (as a result of climate change)

- 1.16 At paragraphs 7.20 to 7.23 of Mr Bedwell's proof he directly links the approval of the WCM proposals to increasing the level of coastal change and flood risk at a potential global scale. As a result of this claim, Mr Bedwell states in paragraph 7.22 of his proof that the proposals are in conflict with Policy ENV1 of the Copeland Local Plan and paragraphs 171 and 172 of the NPPF.
- 1.17 Mr Bedwell does not suggest that the WCM proposals conflict with the relevant Flood risk and coastal change policy from the Cumbria Minerals and Waste Local Plan (DC19 – Flood Risk and DC20 The Water Environment).
- 1.18 Mr Bedwell does not say that the development of the WCM will directly result in an increased level of flood risk or coastal erosion as a result of water discharges from within the site. Nor does Mr Bedwell state that the development of the WCM proposals will remove existing flood capacity storage that would lead to a risk of flooding occurring elsewhere. Indeed, Mr Bedwell does not produce any expert evidence relating to any increased level of flood risk or coastal erosion attributable to water discharges from within the site.
- 1.19 The only basis upon which it is said that these matters are relevant is because it is alleged that the proposal will give rise to unnecessary GHG emissions and climate change impacts. The issue of the WCM proposals' relationship to climate change and the need to transition towards a low carbon economy are addressed in the proofs of evidence prepared by Caroline Leatherdale [WCM/CL/1] and Jim Truman [WCM/JT/1]. It is against relevant climate change policies that this issue should be addressed, since it is those policies which seek to avoid the harmful consequential effects of climate change by addressing the causes of climate change. Indeed, that is the whole basis for giving consideration to GHG emissions in the first instance.
- 1.20 In my view it is not appropriate to rely upon unspecified and unqualified effects which are said to be the general result of climate change in order to demonstrate non-compliance with

other policies, such as those relating to coastal change or, for example, those relating to ecology, landscape, the economy and human health.

- 1.21 Moreover, the application proposes that the mine will be net zero compliant throughout its whole life. The coal extracted from the site will substitute coal that otherwise would have been imported into the UK and Europe to support its steel manufacturing facilities, from predominantly the USA, removing the transportation carbon emissions associated with that as a result. Therefore, even if it were relevant to consider policy compliance of the broader effects of climate change the application proposals would, if anything have a positive effect upon climate change and associated coastal change particularly when compared to maintaining the current *status quo*.

Responding to Dr Martin's complaints regarding site access

- 1.22 Included in Appendix 4 of Mr Bedwell's Proof of evidence is a letter prepared by Dr Martin of E3 Ecology.
- 1.23 Dr Martin's letter refers to the delay in gaining access to the site to review the habitats present. A letter from Ward Hadaway (Appendix 1 of this rebuttal – WCM/ST/4) provides details regarding the steps taken by the Applicant to try and facilitate Dr Martin's access to the site. It also explains that the delay arose because the right to grant access to third parties was not within WCM's gift, as noted at the case management conference.

Ecology policy interpretation

- 1.24 In paragraph 7.10 and sub paragraph 8.10.1 (*sic*) of Mr Bedwell's proof, he states that:

"[The] CMWLP (2015-2030) formally identifies ancient woodlands as a feature that are of national, European and international importance and attracting the strongest protection under Policy SP15 Environmental assets."

- 1.25 However, this is a misleading summary of the policy and its supporting text. The policy does not identify ancient woodlands as a feature of European and International importance, and I am advised that it could not do so as a matter of law. Instead, Box 8.1 lists a large number of environmental assets, which include European Designations, such as, Special Areas of Conservation and Special Protection Areas, and other international designations, such as World Heritage Sites. The list also includes ancient woodland. However, this on the basis that it is identified (at a national level) in the NPPF as an "irreplaceable habitat". The status of ancient woodlands is then correctly dealt with in the wording of Policy SP15, which does not afford it the strongest protection (compare with, for example, the approach to Ramsar and European Wildlife Sites), and instead, addresses it under the final sub-heading dealing with environmental assets not protected by national, European, or international legislation.

- 1.26 Mr Bedwell then goes on to explain why he considers that para. 180(c) of the NPPF presents a higher bar (than the previous para. 118 of the 2012 NPPF) because it now states that development resulting in the loss or deterioration of ancient woodland should be refused unless there are wholly “exceptional reasons”, and a suitable compensation strategy exists.
- 1.27 However, in doing so, Mr Bedwell omits to make any reference to footnote 63, which explains that wholly exceptional reasons may include infrastructure projects where the public benefit would “clearly outweigh the loss or deterioration of habitat”. Accordingly, regardless of whether or not the change to the NPPF imposed generally a stricter test, footnote 63 confirms that, in the case of infrastructure projects such as this development, satisfaction of the test in Policy SP15 would also meet para. 180(c) of the NPPF. Indeed, the test in SP15 is given as an example of what may constitute “exceptional reasons.”

Local employment

- 1.28 Paragraph 8.1 of Mr Bedwell’s Proof includes the concluding remarks from Rebekah Diski in relation to economic benefits, in which the economic benefits of the WCM proposals are largely downplayed.
- 1.29 Not all of the points raised by the economic witness will be addressed in this rebuttal.
- 1.30 The economic benefits to be delivered by the WCM proposal have been a key reason why many local stakeholders, such as the local town and parish councils, elected politicians and local residents have stated their support of the scheme.
- 1.31 The views of those who at first hand will understand the significance of, and will benefit from, the improved employment opportunities and associated economic benefits that will be generated by the WCM proposals should be given considerable weight on this matter.
- 1.32 Furthermore, I would like to address the claim which is made at paragraph 8.1.2 of Mr Bedwell’s proof that *“80% of the operational workforce will be locally sourced is highly likely to be unworkable in practice because the vast majority of locals surveyed (47 of 1617) do not claim to be experienced miners.”*
- 1.33 The logic of this statement is flawed, as on this basis no new forms of development or large-scale employment would ever be supported if there was not a pre-existing local cohort of potential employees already skilled in the required roles. Such an approach appears to be highly discriminatory against those in poorer regions and is predicated upon the assumption that the working population around the WCM proposals cannot acquire new skills. It is widely

recognised that equity and equality deficits results in barriers to access, learning and employment for disadvantaged groups.

1.34 I doubt that this argument would have been made if, for example, the site was developed for a new car battery plant or wind farm manufacturing facility, for which there are possibly no local residents that claim to have any relevant experience of working within those industries. Government policy is committed to lifelong learning and upskilling. This is also reflected in the government's January 2021 White Paper "Skills for jobs: lifelong learning for opportunity and growth." In the Queen's Speech 2021 the government set out proposed new laws to help the UK "Build Back Better" and stronger from the pandemic with the Skills and Post-16 Education Bill.

1.35 Appendix 4 of Mr Kirkbride's proof of evidence [WCM/MAK/2] provides an organogram of the roles required at the site once operational. The skills and roles are wide ranging, including the following different occupations:

- Accountants
- Procurement
- Security
- IT
- Office administrators
- Geologists
- Human Resources
- Surveyors
- Mechanical engineers
- Electricians

1.36 It is unlikely that previous mining experience will be essential for any applicant seeking to fill any of these roles.

1.37 Moreover, training will be provided for all staff working on site, regardless of their roles. Given the nature of the work involved and variability from operation to operation, it is common practice for anyone starting a new role on any mineral extraction site to receive operation and site-specific training. This is addressed further in Mr Kirkbride's rebuttal witness statement.

1.38 The applicant has also committed to entering into a partnership programme with a local college to ensure that those entering onto it develop the required skills needed to work at the WCM site.

- 1.39 A recent example that underlines the flaw in Rebekah Diski's evidence is the development of the Wood Smith Polyhalite Mine by Anglo American, within the North Yorkshire Moors National Park. This project recently announced that it had created 1300 new jobs, of which 70% have been filled by those living locally to the site. A news article dated the 8 July 2021 providing this information on this point is included as Appendix 2 of this rebuttal proof [WCM/ST/4]. The Anglo American project is similar to the WCM proposals in so much as it has involved the creation of an entirely new underground mine. The level of employment to be provided is over twice the size of the proposed WCM proposals and has still been able to attain a level of local employment of 70%.
- 1.40 In my opinion, Mr Bedwell's position on this point is simply not credible.

Tourism impacts

- 1.41 In paragraphs 7.46 to 7.57 Mr Bedwell describes the effect the WCM proposals, in his view, will have upon the tourism as a result of being able to see the RLF from parts the Wainwright Coast-to-Coast walk and from a walking route promoted by St Bees Parish Council. Mr Bedwell then assigns substantial weight to these effects in paragraph 9.14 of his proof of evidence.
- 1.42 It should be noted that St Bees Parish Council, who promote the St Bees Circular Walk 7, and are amongst other things concerned about the tourism offer of St Bees, wholly support the WCM proposals [Paragraph 5.12 of CD4.5].
- 1.43 Both Paul Bedwell and Rebekah Diski make a link with being able to view the RLF from the public rights of way (PROW) and then draw the conclusion that this will result in harm to the local tourism industry. No evidence is provided to support this claim within either proof, aside from referring to the October 2020 planning committee report.
- 1.44 This is presumably based on the assumption that walkers undertaking the route will make the conscious decision to not undertake the well-known long-distance Wainwright Coast-to-Coast walk because of the presence of the RLF.
- 1.45 The visual impact of the RLF upon the users of the right of way is discussed in the evidence of Mr Flannery [WCM/1/JF] and is not repeated here.
- 1.46 The Wainwright Coast-to-Coast walking route is well established and runs between St Bees and Robin Hood's Bay for a distance of 182 miles.
- 1.47 At multiple locations the route crosses significant pieces of transport related infrastructure including numerous B-Class roads, four rail lines (including both West Coast and East Coast

main rail lines), 13 A-Class roads (including the A66 and A19) and two 3-lane motorways (M6 and A1(M)).

- 1.48 It is not uncommon or unexpected therefore for users of the route to have to negotiate short stretches of fixed elements of transport infrastructure.
- 1.49 When approaching the RLF from the west along the Coast-to-Coast path, due to the topography, vegetation cover and alignment of the path, the RLF will be visible for an approximate distance of 600m (from approximately east of Bell House Farm), which is the equivalent of a 5–10-minute walk. This distance represents roughly 0.1% of the overall Wainwright Coast-to-Coast route.
- 1.50 In the context of the above, it is my view that it is highly unlikely that anyone who would genuinely want to undertake the multi day Coast-to-Coast route would be discouraged from doing so due to the presence of the RLF element of the WCM proposals.
- 1.51 Furthermore, the WCM proposals include contributions to making enhancements to a number of heritage assets (Barrowmouth Gypsum and Alabaster Mine, Saltom Coal Pit and Haig Colliery) as well as improvements to cycleway signage. These obligations (contained with the proposed S106 agreement) will complement, not detract from the current tourism offer of Whitehaven and its surrounds.
- 1.52 Based on the above, I do not accept that the WCM proposals, as Mr Bedwell suggests, are in conflict with Policy ER10 of the Copeland Local Plan.
- 1.53 In paragraph 7.50 of Mr Bedwell's proof he notes that there is no adequate diversion route for the Coast-to-Coast route during the construction phase of the RLF. This is a temporary diversion of a very small part of the footway. He notes that this matter will be covered by a condition (43) within the agreed SoCG between CCC and WCM.
- 1.54 At this stage a number of solutions are possible, including one which provides effectively a traffic light-controlled crossing route for pedestrians through the areas affected by the RLF construction works. Any such system could be designed so that any pedestrians on the right of way are given priority and all site traffic is held until they are safely through any working area. Managing public rights of way, particularly during the construction phase of any given development is not an uncommon practice.
- 1.55 In any event, the temporary diversion of part of the public right of way will also be subject to a separate legal process which will involve further public consultation on the adequacy of any proposed diversion route.

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order 2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation To

The Planning Application Reference 4/17/9007 For Application For Development Of A New

Underground Metallurgical Coal Mine And Associated Development To Be Located At

Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

APPENDIX – WCM/ST/4

This is the Appendix marked WCM/ST/4 referred to in the Rebuttal Proof of Evidence of Samuel Thistlethwaite dated 31.08.2021 on behalf of West Cumbria Mining Ltd

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Document 1

This is document 1 referred to in the Appendix marked WCM/ST/4 on the Rebuttal Proof of Evidence of Samuel Thistlethwaite dated 31.08.2021 on behalf of West Cumbria Mining Ltd

Sam Thistlethwaite
Barton Willmore
The Forum
The Pearl
New Bridge Street West
Newcastle
NE1 8AQ

Your Ref:
Our Ref: MKH.WES121.30
Doc No: 32642997v1
Date: 31 August 2021

**By email only: Sam Thistlethwaite Sam.Thistlethwaite@bartonwillmore.co.uk
Cc: Peter Shepherd <p.shepherd@bsg-ecology.com>**

Dear Sirs

**Our client: West Cumbria Mining Limited ("WCM")
Called-in planning application for new metallurgical coal mine and other works by the
Secretary of State
Site Address: Former Marchon Site, Kells, Whitehaven, Cumbria**

You have asked us to respond to a point raised in the proof submitted by Paul Bedwell on 10 August 2021 on behalf of SLACC at paragraph 7.4 thereof which states that SLACC's ecologist, Dr Martin, was not granted access to the application site to conduct surveys until the 23 June 2021.

As you are aware, this firm has acted for West Cumbria Mining ("WCM") for a number of years. We were initially instructed to advise WCM on governance and corporate matters but over the past 6 years have provided legal advice in respect of the company's negotiations with the various land owners in relation to the assembly of the necessary rights and legal interests to support the proposal. As would normally be the case, such negotiations have not resulted in WCM immediately acquiring either a long leasehold or freehold interest in the site, and has instead secured those necessary interests in a conditional form, principally by way of option agreements with the relevant landowners. What that means is that WCM do not currently own any part of the site and have no legal basis to be able to grant or procure the grant by any of the landowners of rights to Rule 6 parties' consultants to carry out survey work on the land.

We would add that although, as one would expect, WCM has secured rights of access for themselves to carry out surveys on the land, such rights do not extend to Rule 6 parties' consultants. In our experience, securing rights that extensive would not be usual and would likely be resisted by landowners.

We set out below the chronology regarding the requests for site access that have been made to us by those acting on behalf of SLACC (Messrs Richard Buxton) –

23/4/21 - The first time that WCM or ourselves were approached by SLACC in relation to the access of the site was by email from Richard Buxton on 23 April 2021 in which it was suggested that SLACC had previously approached WCM in relation to access via Cumbria County Council (the "Council").

23/4/21 – We issued a holding response to Richard Buxton by email on the same day assuring them that we would take instructions in relation to the matter.

Ward Hadaway LLP is a limited liability partnership registered in England and Wales under number OC430614. Registered office: Sandgate House, 102 Quayside, Newcastle upon Tyne, NE1 3DX where a list of members' names is available for inspection. We use the word "partner" to refer to a member of Ward Hadaway LLP. Authorised and regulated by the Solicitors Regulation Authority (No. 817773).

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730360 Newcastle Upon Tyne 30

27/4/21 - We responded substantively to Richard Buxton on 27 April explaining that our client was keen to cooperate with the request but that, contrary to what SLACC had been given to understand, WCM had at no point been approached by Cumbria County Council in relation to any such prior request. Furthermore, it was explained that we were not aware of SLACC or their solicitors having ever previously made such a request notwithstanding their longstanding involvement in this matter and the fact that the existing ecological surveys had been freely available to download for a number of years. It was also explained that WCM does not own any part of the land to which the request relates and as such it was not within WCM's gift to grant the necessary rights of access to facilitate the surveys. However, to assist, we did provide full details of the land agents acting on behalf of the various landowners and explained that the owners and agents will wish to properly understand the reason why rights of access are now being requested.

29/4/21 - Using the information we provided them, a request for access was then formally made on 19 April 2021 by those acting for SLACC direct to the relevant land agents explaining that access would be required by SLACC's ecologists for the beginning of May 2021.

5/5/21 - Richard Buxton then wrote to us on 5 May explaining that access had been denied by the various landowners/land agents. The email asked if the Applicant could again assist with facilitating access, though accepted that the Applicant was under no obligation to do so.

7/5/21 - We responded on the 7 May confirming that we would take instructions but making clear that access to the site by their client was not something our client had any control or influence over.

25/5/21 - Richard Buxton emailed on 25 May suggesting that if WCM encourages the landowners to cooperate, it is likely that they would do so.

1/6/21 – we emailed Richard Buxton copying in each of the relevant land agents again explaining that it is not within the gift of WCM to grant or refuse access over an area of land that is outside their ownership and control regardless of the merits or necessity of such further assessments to the inquiry process. At the same time, it was made clear that we had asked our client to again make contact with the land agents to reconsider their position and further that we had asked them to do this in light of the need to ensure the parties can proceed on an equal footing at the inquiry. However, issue was taken with the suggestion from Richard Buxton's email of 26 May that the mere encouragement of WCM will of itself likely lead to the necessary rights being granted. It was pointed out that that statement did not bear out the commercial and practical reality of negotiating with landowners who were naturally very wary of the inquiry process and the tremendous amount of publicity the scheme had attracted.

4/6/21 – conscious of the potential deadlock between the various landowners and Richard Buxton we emailed Richard Buxton confirming that our client's ecologists, BSG, would be happy to attend a meeting with SLACC's consultant to allow him to ask any questions he may have and consider any additional information requested.

11/6/21 – Richard Buxton emailed us and two of the land agents noting that one of the reasons access may have been refused related to one or more instances of trespass on the land by objectors to the scheme which had made the landowners wary of the request that was now being made. Richard Buxton commented that, whilst the offer of a meeting with WCM's instructed ecologists was welcome, such a meeting would be far more useful once SLACC's ecologist had the opportunity to visit the site.

11/6/21 – we responded to Richard Buxton later that day explaining that the instances of trespass have not made the question of facilitating access any easier for either party and noting that it was regrettable that SLACC seemed disinclined to allow for a meeting to take place between parties' ecologists.

23/6/21 – access to the site was facilitated.

2/7/21 – we emailed Richard Buxton asking whether further to their comment that the offer of a meeting with WCM’s instructed ecologists would be welcome once their client’s ecologist has visited the site, given that a site visit was facilitated on 23 June, if a meeting could now be arranged between our experts. A response is still awaited.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Kamran Hyder', with a large, sweeping flourish underneath.

Ward Hadaway LLP

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kamran.hyder@wardhadaway.com

Document 2

This is document 2 referred to in the Appendix marked WCM/ST/4 on the Rebuttal Proof of Evidence of Samuel Thistlethwaite dated 31.08.2021 on behalf of West Cumbria Mining Ltd



Business

Anglo American's Woodsmith mine near Whitby has created thousands of jobs, and most are taken by locals

Hundreds of jobs have been created for people in the Scarborough and Whitby area through the Woodsmith polyhalite mine in the North York Moors National Park.

By Corinne Macdonald

Thursday, 8th July 2021, 12:06 pm

Updated Thursday, 8th July 2021, 12:09 pm





An aerial view of the Woodsmith mine from Anglo American

The mine project, at Sneaton near [Whitby](#) was taken over by Anglo American in 2020 after it took over former owners Sirius Minerals.

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When complete it will produce polyhalite, a naturally occurring mineral which can be sold as a crop fertiliser.

Of the 1,300 strong workforce, 70 per cent are local residents, Dr Briony Fox, director of conservation and polyhalite project at the North York Moors National Park told members of the park’s authority.

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“A wide range of activity has been delivered by Scarborough Council and Anglo American under the Scarborough Employment Opportunities contribution,” she said, adding: “Apprentice engineers have been recruited and the mine is giving support to the Scarborough Jobmatch and Skills Village initiatives which provides training and support for local people to access the jobs market.”

Robert Goodwill, MP for Scarborough and Whitby, said: “This is great news that Anglo American are delivering on their commitment to recruit locally.

“This will have tremendous knock on effects on the wider economy as workers spend locally.”

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Gareth Edmunds, corporate relations director for Anglo American Crop Nutrients, said: “We have a longstanding commitment to employ as many people from the local area as possible and we will continue to employ locally as the Woodsmith Project progresses over the coming years.”

Anglo American say that up to 1,000 direct long term jobs will be created for highly skilled employees by the mine project as well as up to 1,500 further jobs in the supply chain.

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Dr Fox said in her address to the North York Moors park authority that in the next 12 months, the mine is to address schemes of conditions discharge and to continue site monitoring of the mine.

In addition, she added, Anglo American will also engage in activities with partner organisations to promote the tourism industry in the National Park through grants.

The Woodsmith mine project was conceived in 2010 by Sirius Minerals though construction did not begin until May 2017 after several years of back and forth to get planning permission.

It involves sinking two mineshafts into the polyhalite ore over a mile beneath the surface and the construction of a 23 mile tunnel to a processing and shipping plant on Teesside.

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Work on the tunnel began in June 2018 with tunnel boring machines arriving in April 2019.

What is polyhalite fertiliser?

Polyhalite is a naturally occurring mineral which contains four of the six nutrients needed for plant growth - potassium, sulphur, magnesium and calcium.

Anglo American will sell it as a low chloride, multi-nutrient fertiliser suitable for organic use that can boost crop yields and aid more sustainable farming.

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Polyhalite is only mined from a layer of rock on the North Yorkshire coast which was deposited 260 million years ago.

The Boulby Mine near Staithes is currently the only producer of polyhalite in the world .

As well as being sold in Europe, key markets for the fertiliser are China and Brazil.

Whitby





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Document 3

This is document 3 referred to in the Appendix marked WCM/ST/4 on the Rebuttal Proof of Evidence of Samuel Thistlethwaite dated 31.08.2021 on behalf of West Cumbria Mining Ltd

Cumbria County Council
Environment - Planning & Sustainability
County Hall (County Offices)
Busher Walk
Kendal
Cumbria
LA9 4RQ

Our ref: NO/2017/109919/05-L01
Your ref: 4/17/9007
Date: 28 January 2019

Dear Sir/Madam

**CONSULTATION ON FURTHER INFORMATION SUBMITTED IN RELATION TO A
MINERAL COUNTY MATTER APPLICATION FOR PLANNING PERMISSION
ACCOMPANIED BY AN ENVIRONMENTAL STATEMENT**

**PROPOSED NEW UNDERGROUND METALLURGICAL (COKING) COAL MINE
AND ASSOCIATED SURFACE DEVELOPMENT; POW BECK VALLEY AND AREA
FROM MARCHON SITE TO ST BEES COAST, CUMBRIA**

Thank you for re-consulting the Environment Agency on the above application and the further information submitted by the applicant in response to a Regulation 22 notice.

Environment Agency position

We have reviewed the additional information as submitted. We have no objection to the proposed development but we request that any subsequent approval includes the following conditions:-

1. Land quality and remediation

a) General comments:

It is noted that the need for supplementary ground investigation, risk assessment and remediation is referenced in the application. The site specific conditions relating to these works agreed with us previously and recommended in our response dated 7 February 2018 are still applicable.

The amended Environmental Statement refers to the waste regulation and permitting aspects of the proposed cut and fill operations for bund formation and construction of the formation layer. While these operational activities will be subject to separate

Environment Agency
PO Box 519, South Preston, Lancashire, PR5 8GD.
Customer services line: 03708 506 506
www.gov.uk/environment-agency
Cont/d..

regulatory control, a working plan to manage the phasing of works could be conditioned as part of any subsequent approval.

The revised scheme does not involve dewatering, treating and discharging mine water. This should reduce the overall potential for environmental harm, however the treatment of mine waste (3800 tonnes) to form the paste at the paste plant is a new element of the scheme. This will need to be considered further to ensure its placement underground will not cause pollution. The treatment process and disposal will need to be quality controlled while storage, processing, validation and disposal underground may need to be regulated through the Environmental Permitting Regulations or through HSE mining regulations. An agreed methodology for replacement of paste in abandoned workings is required as a condition under planning to ensure the activity does not cause groundwater pollution.

b) Detailed comments:

- i. The non-technical summary document states that the previous site owners agreed with the appropriate authorities that the contaminated land designation could be removed, but this is not the case. As the regulatory authority for Special Contaminated Land sites, we agreed to enforce the relevant regulations by means of a "Remediation Statement" with associated legally-binding conditions. Assessing compliance with the conditions ensured the site no longer posed an unacceptable risk to human health and the environment. This nullified the designation of the site as a contaminated land special site.
- ii. Temporary storage lagoons are identified on main mine construction plan (869_AM_003C) and main mine construction phase 2 (869_AM_004C) and phase 3 (869_AM_005C). Some information regarding de-sludging is provided, but detail regarding design, construction and decommissioning is required. Details of the drainage infrastructure is also required, highlighting surface water runoff collection and transmission to the storage lagoons. Detail regarding the design and integration of the surface water tank under the northern bund is required when construction is complete. This is not shown in the main mine proposed site plan (869-AM- 002D), but it is in all the construction phase plans. Is this an omission from plan 2?
- iii. The location of the main water tank (869_AM_033A) overlaps the boundary of the Hutbank quarry landfill and appears to be located over the leachate pipework draining the landfill. There is insufficient information in the application regarding
 - a) Protection of the leachate pipework
 - b) Technical mitigation /impact on the landfill; and
 - c) Legal implications for this and any other component of the development that overlaps the former landfill boundary. The existing topographical plan (869_AM_007C) does not show the water tank overlapping the boundary to the landfill.
- iv. The cut and fill plan representation on plan 869_AM_008A does not include the bunds on the northern and southern boundary. Cross sections across the whole site in in different orientations should be provided.
- v. The proposed landscaping plan (A869-AM-41G) and restoration plan (A869-AM-42C) show landscaping to extend from the southern boundary bund over the Marchon landfill. How will this affect the capping system of the former landfill? The design needs to be agreed to ensure the capping / low permeability system is not compromised. A condition ensuring the capping integrity of the Marchon landfill is

Cont/d..

not compromised would be useful, but cannot be applied if it is outside the boundary of the planning application.

- vi. The bund fill on plan 869_AM_201A is an acceptable representation of the proposal for the southern embankment, however it does not portray where existing soil profiles will be cut or altered to form the embankment. Colour coded cross-sections would be useful to illustrate this. There are no cross-sections for the northern perimeter bund. Further cross-sections defining the cut and fill operations are required and should include geotechnical construction details and geochemical risk assessment to minimise migration of contaminants and reduce risk of pollution. It is noted the Environmental Statement identifies the use of a large cover over the bund to mitigate impacts of rainfall on exposed soils. This proposal should be integrated in to the working plan as an agreed condition of the planning permission. Other details regarding construction would benefit our understanding for pollution prevention. Drainage provisions detailing pollution prevention from soil stockpiles are also required.
- vii. Figure 5.2 in the Flood Risk and Surface water management plan (Appendix 12.7) outlines the catchment areas for surface water runoff, but it is unclear as to whether or not this takes account of the periphery bunds on the developed situation plan.
- viii. Paragraph 6.1.4.1 in the Flood Risk and Surface water management plan (Appendix 12.7) assumes the remediation phase to be 6 months. This allocated time may be longer depending on the findings of ground investigation if soil and /or groundwater is required to be treated. Remedial treatments may require mobile treatment permits and validation for treatment of soils and groundwater may take time so a 6 month remediation phase may be optimistic.
- ix. The need to include Appendix 12.9 is questionable since the relevance of issues regarding dewatering have been resolved by the proposed driving of new tunnels. There may now only be limited dewatering associated with the drilling of the new tunnels.
- x. It should be noted that the desk study information and detail from the Contaminated Land Remediation Statement used to regulate risk assessment and cleanup of the Rhodia site under EPA 1990 part2A has been copied directly in to Chapter 13 of the Environmental Statement. Where the information is relevant this is not an issue, but the geological cross-sections and plans from these third party reports should be updated / revised to take account of ground investigation data derived from the applicant's investigations.

Given the above comments, we request that any subsequent approval is conditioned as follows:-

Condition Remediation strategies shall be prepared for each of the following components of the development. The remediation strategies shall be submitted to, and approved in writing by, the Local Planning Authority prior to the commencement of development in that component:

- a) Main Mine Site;
- b) Subsurface Conveyor between the Main Mine Site and Rail Loading Facility; and
- c) Rail Loading Facility

The remediation strategy for each component shall set out the measures to deal with the risks associated with contamination of that part of the site. The remediation strategies will include the following components:

1. A preliminary risk assessment which has identified:
 - All previous uses;
 - Potential contaminants associated with those uses;
 - A conceptual model of the site indicating sources pathways and receptors; and
 - Potentially unacceptable risks arising from contamination at the site.

2. A site investigation scheme based upon the preliminary risk assessment to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site. The site investigation schemes for each component of the development shall be informed by the preliminary risk assessment and include all of the following elements, unless any element(s) is/are deemed unnecessary by the local planning authority in the light of the results of the preliminary risk assessment:
 - programme, timing and locations of all proposed site investigation works;
 - sampling and laboratory/field testing methodology employed to ensure that the locations and methods of site investigation (for the main mine site these should be designed so that they can be used to refine the existing 3-dimensional conceptual site model of the site);
 - surveying/monitoring techniques and sampling methods and equipment for chemical and radiological assessment of ground conditions in, on and under the land;
 - quality control protocols for sampling and laboratory analysis;
 - pollution prevention measures to be employed to minimise the potential for the mobilisation of any pollutants which may be encountered during the site investigation.

The site investigation shall be designed and carried out in accordance with the guidance presented in CLR11 and BS10175, considering both potential risks identified in the desk study and details approved in the scheme. Changes to any of the details of this scheme which may result from initial findings of the scheme or for other reasons shall be agreed in writing in advance with the Local Planning Authority. Following completion of the site investigation, an interpretive report will be prepared detailing the findings of the site investigation, and including completion of an initial risk assessment to quantify risks associated with contaminants in soil and groundwater. The report will include appendices of factual data e.g. logs, records and sample analysis on which the interpretive report is based. Any quantitative risk assessment will include a sensitivity analysis and justification of input parameters. The findings will need to acknowledge the existing condition of undisturbed land and, dependent on the findings of this initial phase of site investigation, need to identify additional phases of more detailed site investigation that may be required to better assess the volumes and extents of any contamination hotspots identified.

3. An options appraisal and remediation strategy based upon the results of the site investigation and the detailed risk assessment. The options appraisal and remediation strategies for each component of the development shall be informed by the findings in stages 1 and 2 above. The options appraisal and remediation strategies for each component shall include all of the following elements unless

Cont/d..

any element(s) is/are deemed unnecessary by the local planning authority in the light of the results of stages 1 and 2 above:

- Utilising the historical data available for the site, together with the results from the investigation work undertaken earlier, refine the existing conceptual site model for the site, and complete an initial qualitative risk assessment to identify potential contaminants of concern which may pose a risk to identified receptors (including human health, controlled waters, and ecological receptors) during the construction, operation and decommissioning of the development. The risk assessment shall interpret available data sources to assess the presence of contamination over the entirety of the site, its locations, depths, and concentrations.
 - Assessment of options for remediation/mitigation measures to be employed during construction, operation and decommissioning of the development to minimise the risks identified. The assessment shall include:
 - i) an examination of the options for the removal of concrete slabs to eliminate/minimise the potential mobilisation of contaminants;
 - ii) provide details of the measures, locations, and program for the remediation or disposal of all contaminated material;
 - iii) an assessment of the likelihood of contaminants to become mobilised, the possible pathways along which mobilised contaminants may travel, the concentrations of contaminants and timescales over which receptors might be exposed, the sensitivity of potential receptors to exposure to contaminants of the type which may be mobilised, and the significance of the impacts on receptors.
4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer term monitoring of pollutant linkage, maintenance and arrangements for contingency action.

Reason To ensure the proposed development does not pose an unacceptable risk of pollution to controlled waters

Condition Prior to the commencement of construction works, full details of any proposed works or development over or directly adjacent to the Marchon landfill shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition **(TBC)** above.

Reason To ensure the proposed development does not pose an unacceptable risk of pollution to controlled waters by demonstrating that the integrity of capping on the existing Marchon landfill site is not compromised.

Condition Prior to the commencement of construction work a phasing and management plan for the placement of paste in the mining voids shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with

Cont/d..

condition (**TBC**) above. The plan shall include details of the phasing of proposed filling activities, the volumes of paste to be transferred to the voids, the location and depth of the voids to be filled, an assessment of any risks associated with the transfer of paste to the identified voids and any mitigation measures necessary to ensure the transfer of paste to the voids to manage the risks identified.

Reason To ensure the proposed development does not pose an unacceptable risk of pollution to controlled waters

Condition Prior to the commencement of construction work a working plan shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition (**TBC**) above.

Reason To ensure the works associated with the proposed development do not pose an unacceptable risk of pollution to controlled waters

2. Materials Management Plan – Main Mine Site, Conveyor and Rail Loading Facility

Condition Prior to the commencement of construction work a Materials Management Plan shall be submitted to, and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding site investigation work. The materials management plan shall be developed following the site investigations and risk assessments and shall:

- a. Identify all locations of the main mine site, conveyor and rail loading facility from which material will be excavated;
- b. Utilising the information contained within the contaminated land investigation, identify those areas of excavation which may be subject to contamination;
- c. For areas of excavation which are subject to contamination estimate the volume of material arising, the approximate volumes of material to be remediated on site and provisional volume to be disposed of off-site;
- d. Illustrate where and how the remediation of contaminated material would take place;
- e. Illustrate where and how remediated material would be re-used, including volumetric calculations to demonstrate that the material can be accommodated within the proposed area of use and any measures for containment for this material;
- f. Detail the frequency of testing and testing specification for soils generated during the cut and fill operations, including how the materials are to be segregated and stored;
- g. Identify screening criteria for assessment of whether the materials can be re-used without treatment or mitigation;
- h. For areas of excavation which are not subject to contamination provide the volume of material arising, and illustrate where and how non-contaminated material would be re-used including volumetric calculations to demonstrate that the material can be accommodated within the proposed area.

Once approved the materials management plan shall be implemented in its entirety.

Reason To ensure the proposed development does not pose an unacceptable risk of pollution to controlled waters

3. Construction Surface Water Quality Management Plan

Condition Prior to the commencement of construction work a scheme detailing how surface water flows will be minimised and managed during the construction phase of the development shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition **(TBC)** above. The construction phase surface water management plan shall include the following and be implemented before construction starts:

- a. An assessment of potential flows that would need to be managed at the main mine site, conveyor route and rail loading facility site during construction;
- b. Details of the measures which would be put in place to capture, manage, and discharge flows from the component parts of the site identified in part a.
- c. A programme for the installation, maintenance and removal of the measures set out in part b.
- d. An assessment of potential contaminants which may be present in surface water runoff, and measures to segregate this surface water from clean runoff;
- e. Assessment of potential options to retain, test and treat or remove potentially contaminated surface water runoff during the works;
- f. Details of a monitoring scheme to be implemented to confirm that no contaminants are present in runoff from the site intended for discharge to controlled waters.(before, during and post construction)

Once approved the construction phase surface water management plan shall be implemented in its entirety.

Reason To ensure the construction activities associated with the proposed development do not pose an unacceptable risk of pollution to controlled waters

4. Construction Foul Water Management Plan

Condition Prior to the commencement of construction work a scheme detailing how foul water flows will be managed during the construction phase of the development (i.e. all flows anticipated prior to the connection to mains sewer) shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition **(TBC)** above. The construction phase foul water management plan shall include the following:

- a. An assessment of maximum foul water flows based upon estimates of numbers of construction workers at the main mine site and the rail loading facility;
- b. Details of the measures which would be put in place to manage and discharge flows from the component parts of the site identified in part a.
- c. A programme for the installation, maintenance and removal of the measures set out in part b.

Once approved the construction phase surface water management plan shall be implemented in its entirety.

Reason To ensure the construction activities associated with the proposed development do not pose an unacceptable risk of pollution to controlled waters

5. Code of Construction Practice

Condition Prior to the commencement of construction work a Code of Construction Practice (CoCP) for the Main Mine Site, Conveyor Route and Rail Loading facility shall be submitted to and approved by the Local Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition **(TBC)** above. The CoCP shall include the following:-

- a. Liaison with the public;
- b. The programme of construction works;
- c. The hours of working during the construction phases;
- d. Parking areas for the vehicles of construction workers and visitors;
- e. Areas to be used for the loading and unloading of plant and materials;
- f. Areas for the storage of plant and materials used in constructing the development;
- g. Details of the erection and maintenance of security fencing;
- h. Details of wheel washing facilities including any drainage requirements and maintenance;
- i. Pollution prevention measures including storage of fuels and oils and measures to prevent, contain and manage refuelling of plant and vehicles;
- j. Sediment release prevention measures;
- k. Measures to control the aerial emissions during construction;
- l. Measures to control the emission of noise and vibration during construction;
- m. A scheme for recycling/disposing of waste resulting from construction works;
- n. Access and haul routes for construction vehicles, deliveries, waste vehicles
- o. Timing of deliveries and other construction vehicle movement;
- p. Construction lighting scheme;
- q. Measures to protect heritage assets

Once approved the CoCP shall be implemented in its entirety.

Reason To ensure the construction activities associated with the proposed development do not pose an unacceptable risk of pollution to controlled waters

6. Site Waste Management Plan - Construction

Condition Prior to the commencement of construction work a Site Waste Management Plan (SWMP) shall be submitted to and approved by the Mineral Planning Authority. For the purposes of this condition the term 'construction work' shall be taken to include any works to include works to prepare the site for development excluding Site Investigation undertaken in accordance with condition **(TBC)** above. The site Waste Management Plan shall include details of:

- a. the anticipated nature and volumes of waste that will be generated by construction work;

Cont/d..

8

- b. the measures to minimise the generation of waste as a result of demolition, building, engineering and landscape works;
- c. measures to maximise the re-use on-site of such waste;
- d. measures to be taken to ensure effective segregation at source of other waste arising during the carrying out of such works, including the provision of waste sorting, storage, recovery and recycling facilities as appropriate

The approved SWMP shall be implemented throughout the period of construction work on site

Reason To ensure the construction activities associated with the proposed development do not pose an unacceptable risk of pollution to controlled waters through the inappropriate management of waste on site

Advice to local authority: Environmental Permitting

This development will require an environmental permit under the Environmental Permitting (England and Wales) Regulations 2016. In circumstances where an activity/operation meets certain criteria, an exemption from permitting may apply, more information on exempt activities can be found here:

<https://www.gov.uk/guidance/register-your-waste-exemptions-environmental-permits>

There will be a need for an environmental permit (mining waste permit) for the disposal of the paste material underground. This has already been communicated to the applicant but no further discussion has taken place. In addition there may be a need for a permit for the new paste plant. We would advise the applicant to seek detailed permitting pre-application advice (which may be chargeable) by completing / submitting the following forms <https://www.gov.uk/government/publications/environmental-permit-pre-application-advice-form>

Advice to applicant: Flood risk activities

Pow Beck St Bees is a designated Main River watercourse. For any work within 8 metres of Main River and within 16 metres from a tidal flood defence structure, an environment permit will be required to control works proposed.

Your environment permit application must demonstrate that:

- There is no increase in flood risk either upstream or downstream
- Access to the main river network and sea/tidal defences for maintenance and improvement is not prejudiced.
- Works are carried out in such a way as to avoid unnecessary environmental damage.

Mitigation is likely to be required to control off-site flood risk.

We will not be able to grant an environmental permit until it has been demonstrated that the proposals satisfy the above flood risk requirements.

If you have any further questions regarding this response, please do not hesitate to contact me.

Yours faithfully

Cont/d..

9

Philip Carter
Planning Officer - Sustainable Places



cc West Cumbria Mining Ltd

End

10

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order
2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation
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The Planning Application Reference 4/17/9007 For Application For Development Of A New

Underground Metallurgical Coal Mine And Associated Development To Be Located At

Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

WCM/WLT/3

Rebuttal on matters relating to Post-Closure Methane Emissions

William Lawrence Tonks C.Eng FIMMM

On behalf of West Cumbria Mining Ltd

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1. Introduction

- 1.1 This rebuttal proof of evidence primarily addresses some of the matters raised in the proof of evidence of Professor Michael Grubb (SLACC/MG/1) which was submitted to the inquiry on the 10 August 2021 and specifically paragraph 4.27 of professor Grubb's proof in which it is suggested that fugitive emissions are not included in the estimates for any period after coal mining ends.
- 1.2 This rebuttal is not intended to be a response to every point of disagreement between Professor Grubb's proof and the WCM case.
- 1.3 The main matters addressed within this rebuttal relate to the following topics:
- 1.3.1 The likelihood of any abandoned mine methane (AMM) emitting from the Woodhouse Colliery once it has been abandoned and sealed;
 - 1.3.2 The historic post-closure methane emissions from previously abandoned mines;
 - 1.3.3 The proposal for sealing and capping the mine to prevent post-closure methane emissions; and
 - 1.3.4 Post-closure monitoring.

2. The likelihood of any abandoned mine methane (AMM) emitting from the Woodhouse Colliery once it has been abandoned and sealed

- 2.1 When production has finished at Woodhouse Colliery and has been closed, it will be termed an "abandoned mine". There may be concern that Woodhouse Colliery may emit methane in a similar way that many abandoned mines across the United Kingdom have done in the past. The abandoned mines that have been noted to emit methane are where their shafts or drifts were still connected to old mine workings - and these connections had not been filled or stopped off or dammed at any depth within the mine - only having shaft caps or walls built at the surface. By design, these emissions have passed through open vents let in from the surface into the old mine workings through those caps or walls. In contrast, Woodhouse Colliery will be dammed at a depth sensibly advised in the National Coal Board (NCB) publication "The Treatment of Disused Mine Shafts and Adits"¹ and then the drifts will be backfilled to surface before being walled off and no vents will be installed.
- 2.2 The likelihood of any abandoned mine methane (AMM) emitting from the Woodhouse Colliery once it has been abandoned and sealed proficiently will be almost zero (see part 4 below regarding proficient sealing). Furthermore, any residual uncertainty can be avoided through post-closure monitoring to ensure that the seal is effective in preventing methane leakage.

3. Historic post-closure methane emissions from previously abandoned mines

- 3.1 Some of the previously abandoned deep coalmines in the UK have in the past been catalogued to be emitting methane through vents. These emissions were driven mainly by naturally occurring barometric pressure swings, where acting under Boyles Law, gas/air mixtures breathed out of the mines' voids during atmospheric pressure falls and

¹ "Adit" is an old fashioned mining name for a drift.

air breathed back in during atmospheric pressure rises. It has been noted that these emissions have all gradually diminished over time (more or less following the tracks of a series of scientific “emission over time” curves derived from historic data). These vents were deliberately installed in the past (i.e. pipes and flame arrestors let in through concrete shaft caps) by the NCB / British Coal / Coal Authority, to allow scientific instrumental access to mine voids, mainly via open unfilled shafts, to be able to monitor the underground environment at strategic points around UK coalfields: regarding flood water levels; mine air pressure; and AMM gas analysis. The purpose of this activity was to allow access to these unfilled shafts to observe the behaviour of abandoned mines and determine how they might affect adjacent mines that were still working, that could have been, for example, previously connected to the abandoned mine by old underground roadways in previously old abandoned seams. Woodhouse Colliery will have no connection to any other coal mines, so this practice will not be required.

3.2 As a point of note, some of the emitting vents around the UK coalfields have been commercialised and the emitting AMM has been captured and used to generate electricity, which mitigates methane emissions from those mines.

3.3 The natural barometric pressure swings causing AMM emissions from any of these un-commercialised abandoned deep coalmines in the UK, nowadays generally consists of AMM mixed with air, contained in the mines voidspaces (volumes often measured in millions of m³), into which the AMM will have primarily originated as pure methane from disturbed/distressed coal seams left behind above and below longwall mining of target seams in those mines.

3.4 As another point of note, the AMM that will be emitted from the abandoned Woodhouse Colliery’s coal is expected to be significantly less compared to abandoned longwall mines, as because of the Run out and Pocket mining technique, it will only be emitted into the mine void from the pillar coal (as slow release methane, much of which will have been previously drawn off by methane drainage as CMM). Any coal seams above and below the target seam will not have been disturbed or distressed due to the presence of these Run Out and Pocket pillars being left behind whilst mining the target seam, so they will not emit methane into the mine void. Because of these low levels of emissions, it is suggested that this mine would not be viable regarding commercialising AMM.

4. Proposal for sealing and capping the mine to prevent post-closure methane emissions

4.1 These proficient methods of sealing off abandoned mines are illustrated in the 1982 NCB Brown Book “The Treatment of Disused Mine Shafts and Adits” extracts of which I append to this proof as "Appendix 1". Many abandoned mines in the UK that were not connected to other (still working) mines and so were not required for monitoring, have been proficiently sealed off by this plugging/damming, then backfilling and capping manner, as described in the Brown Book. Once correctly treated in this manner, these abandoned mines have hardly ever been noted to emit methane from their shafts or adits.

4.2 In Brown Book Part 4, Section 23 (p. 62) the section named Stopping and Filling of Adits states that the stoppings (or dams) should be positioned to have rock cover thickness ten times the height of the drift roof (Woodhouse Colliery drifts will be 3.5m high).

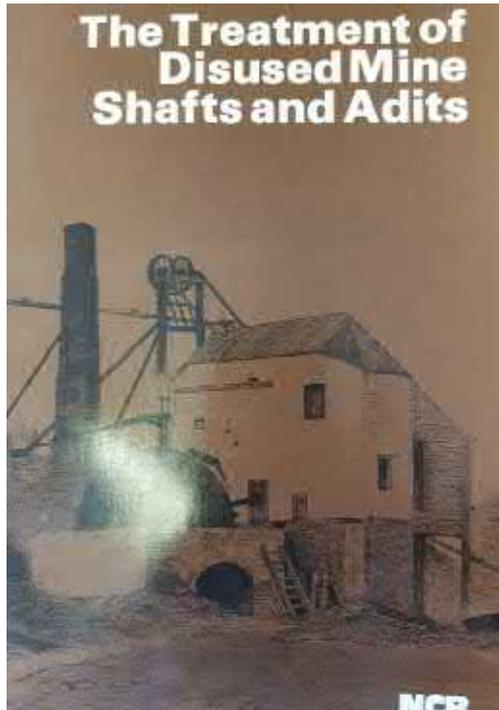


Figure 1- NCB Brown Book Published in 1982

- 4.3 So, for example, if the surface at Woodhouse Colliery was perfectly flat and consisted of rock right up to the surface, then at 1 in 7 (the incline of the two drifts) the dams would have to be 35 metres below ground and, using Pythagoras' theorem, if the horizontal distance was 245 metres (35×7) then the dams would have to be constructed some 247.5 metres linearly down the drifts.
- 4.4 To ensure certainty that no methane will escape from the mine once it is abandoned, the adoption of watertight dam construction method will be chosen and vents will not need to be installed as there will be no other connected working coal mines.
- 4.5 This will involve adherence to Brown Book Part 4 Section 26 (P67), where concrete dams, grouting and backfilling are specified, along with insertion of monitoring pipes outlined in Section 23.

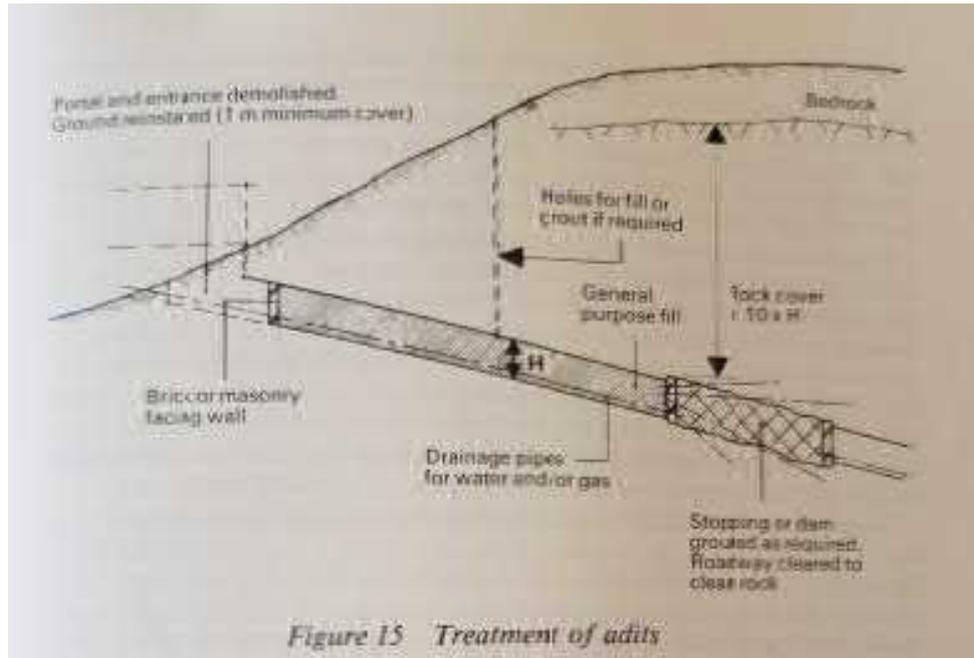


Figure 2 - Brown Book Illustration of the Treatment of Adits (shown steeper at 1:4 compared to Woodhouse 1:7 incline)

4.6 The choice of a watertight dam will give a greater deal of competence regarding grout sealing the concrete dam to the bare rock drift periphery which would further help prevent methane leakage and would also give the benefit that even any long term, localized small ground water in-leakage into the (generally porous) backfill in the drift would then tend to pond above the dam, which would therefore create an hydraulic head (gas tight) seal around the dam too, where the head pressure would further enhance the prevention of any gas escape by wetting the rock and permeating water inwards rather methane outwards. Physics states that every 1 m of head of ponded water would exert 1.43 p.s.i. of pressure upon the seal so for example 10 m of head would be 14.3 p.s.i and the full 35 m of head would be thereabouts 50 p.s.i and it is estimated that the pillar slow release gas pressure within the mine would most likely only ever probably reach around 5 p.s.i. to 10 p.s.i due to it having been “methane drained” over the many years of mining which will have kept the exposed sides of the pillar coal in a negative pressure relative to the atmospheric pressure, where the sides of the pillar coal will therefore have the potential to “mop up” any even deeper even slower emitted methane (if emitted at all, as it is considered that much of it would be too deep to permeate through impermeable centre pillar coal and/or be indefinitely trapped in the coal by the planned injection of paste).

5. Post-closure monitoring

5.1 The drifts will be periodically monitored for a number of years post construction of the dams to ensure that no methane is escaping post abandonment. I understand that this monitoring will be carried out by the Coal Authority.

5.2 The sample pipe(s) passing through the dam(s) will be temporarily opened and measured for air pressure and gas content, before being closed again.

5.3 There will also be pipe(s) passing through the adit “facing walls” to detect any methane in the (generally porous) backfill, which will again be opened, be measured for air pressure and gas content to prove there is no dam leakage, before being closed again.

5.4 These two sets of periodic measurements taken from each drift’s sample pipes will give the differential pressure across their dams and the differential pressure across their facing walls too. They will give the gas composition of any gas found in the (generally) permeable backfill and separately the composition of the gas/air mixtures in the mines drifts behind the dams. Interpretation of these results will indicate the efficacy of their dam’s seals and their facing walls too.

Bill Tonks

William Lawrence Tonks C.Eng FIMMM

31st August 2021

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order
2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation
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Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

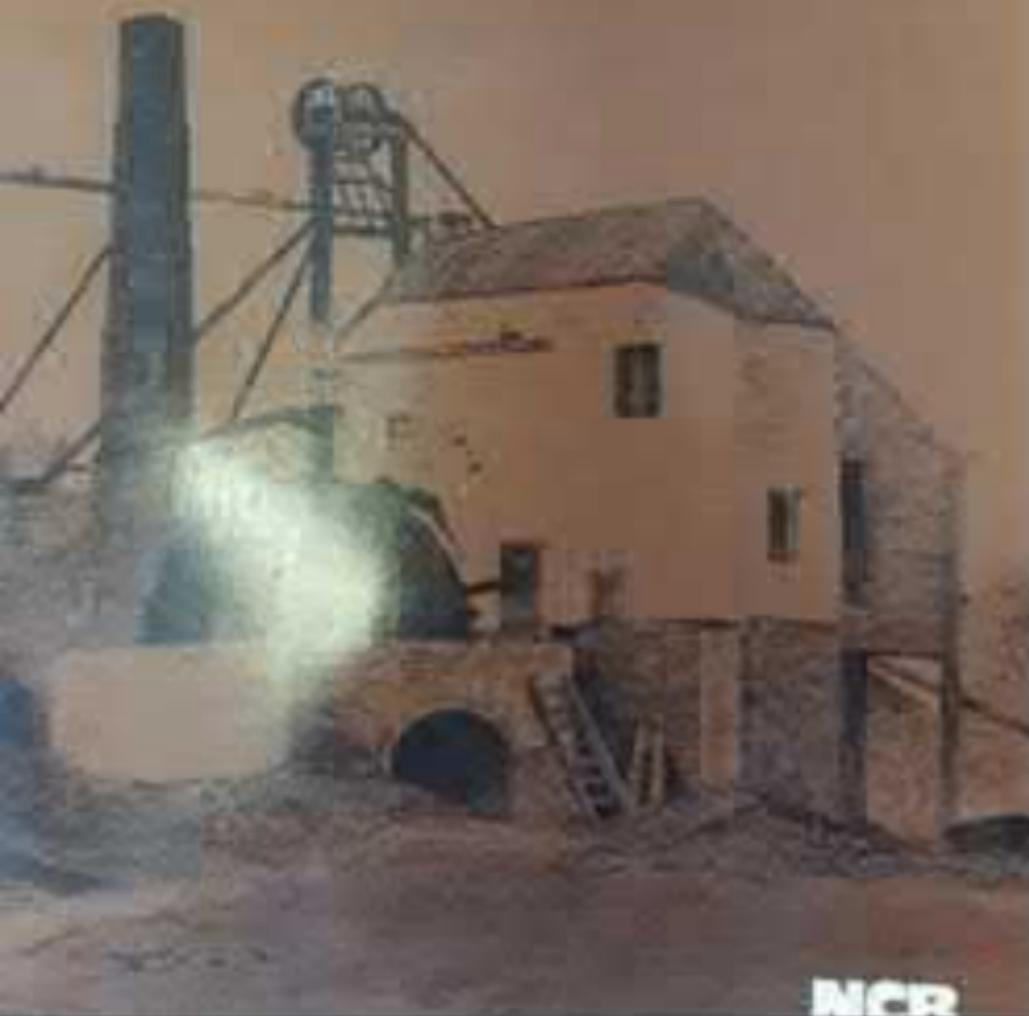
Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

APPENDIX – WCM/WLT/4

This is the Appendix marked WCM/WLT/4 referred to in the Rebuttal Proof of Evidence of
William Tonks dated 31.08.2021 on behalf of West Cumbria Mining Ltd

The Treatment of Disused Mine Shafts and Adits



NCR

THE TREATMENT OF DISUSED MINE SHAFTS AND ADITS

The Treatment of Disused Mine Shafts and Adits

**Mining Department
National Coal Board**

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National Coal Board

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NCB Mining Department, 1982, 88 pages

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Foreword

Old mine shafts arouse public interest and concern as to their safety, and also could be hazardous to actual mining operations, so it is appropriate that the National Coal Board should publish the results of this study of ways to make them safe.

The traditional methods of filling mine entrances or covering them at the surface have remained unchanged in principle through the years. However, as this book reveals, these apparently simple operations are more complex and more hazardous than appear at first sight and require carefully applied engineering design principles.

The practices described, while developed in the UK coal industry, have a wider application to similar problems in other fields of mining. This handbook will also be of help to local authorities and land developers who encounter unsuspected old shafts, but it must be stressed that expert advice should always be sought by such undertakings.

In commending the work of the authors and those others who helped with the compilation of the handbook, acknowledgement is made of the contributions made by the many NCB engineers and surveyors in devising improved methods of investigating and treating old shafts and adit entrances. I am confident that as this work goes on, further improvements in technique will be developed to ensure continued progress in the field of safety.

RB Dunn
Director-General of Mining

Acknowledgement

Acknowledgement is made to the following members of the NCB National Safety Committee:

- PI ALLSOP, Chief Mining Engineer, North Yorkshire Area
- R DITCHFIELD, Manager, Mines Drainage Unit, Yorkshire Areas
- O GREGORY, Surveyor and Minerals Manager, Western Area
- E LEVITT, Chief Surveyor and Minerals Manager (Chairman from October 1971)
- R JORCHARD, Chief Surveyor and Minerals Manager (Chairman up to July 1971)
- RA SWIFT, Chief Ventilation Engineer
- AR TAYLOR, Chief Civil Engineer

Others who have collaborated in the compilation of the handbook are:

- JM GREENWOOD, Deputy Chief Civil Engineer
- HA MARSDEN, Chief Engineer, Western Area
- WLG NASH, Technical Editor
- C RICHARDSON, Surveyor and Minerals Manager, North Yorkshire Area
- I SAXTON, HQ Ventilation Engineer
- J SMITH, Chief Engineer, North Yorkshire Area
- A TAIT, Head of Shaft Sinking and Design Team
- C THIRSK, Senior Civil Engineer (Structures)
- MP WHITLOCK, Head of Environmental and Estates Branch, Legal Department

Preface

There are many old mine workings of various kinds in Britain, some dating from medieval times, which were reached from the surface by means of vertical shafts or adits (inclined roadways). Although only about 750 shafts and adits are associated with operating coal mines, some 100 000 disused entrances which were associated with old mines are recorded by the National Coal Board, the record in most cases being confined to a position marked on a plan. The antiquity of mining in Britain is such that there could well be many more shafts that are unrecorded. Most old coal mine shafts are in the ownership of the NCB.

From time to time it becomes necessary for the NCB or others acting on the advice of the NCB to treat some of the disused shafts to ensure their security. The cases which arise are mainly:

Concealed shafts

Such shafts may open up and demand urgent treatment as a hazard. These are often not larger than 3 m diameter.

Shafts within sites to be (re-)developed

The nature of the development may be such as to make it necessary for old shafts or workings on the site to be treated. In mining areas planning applications for new developments are referred to the NCB which then indicates any known mine shafts or workings on the site and any treatment necessary. This procedure is also followed in respect of opencast mining operations.

Shafts about to go out of use or recently disused

These are usually of larger diameter and greater depth than the older shafts and hence are likely to require more comprehensive treatment.

This handbook has been prepared for the information and guidance of those engaged on the examination and treatment of disused coal mine shafts and adits. It is stressed that the responsibility for the design and supervision of the work in making disused mine entrances safe should be entrusted to qualified engineers experienced in this field. While the handbook is intended to give guidance on general treatment, it does not attempt to describe the more elaborate treatments that may be necessary in exceptional circumstances.

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23 Stopping and filling of adits

Any stopping or dam in an adit should be constructed on the principle described in Section 26. It will normally be to prevent the emission of gas and the loss of fill material that these are required. The selected site should be a sufficient distance in-by where, having regard to the overlying strata, there is little danger of the roof caving up to the surface; a thickness of rock cover of ten times the roadway height is suggested (Fig. 15). If a stopping is used it may be necessary to consider the provision of a specially-designed gas seal. Fill and concreting materials may be taken by conveyor, mine car or slusher loader and, in the case of stoppings, placed by a pneumatic stower. Small earthmoving machines approved for underground use may be used provided that adequate ventilation is maintained. Fill may also be placed in adits through holes bored from the surface, which on completion of the work should be sealed with concrete or bentonite to prevent water from passing directly down the adit. To prevent movement of fill along the roadway or to ensure that it is tight to the strata, it may be grouted from within the adit itself or from surface boreholes.

The adit should be back-filled nearly to the surface and faced with brick or masonry wall. The entrance works and portal should be collapsed and the ground reinstated in a manner appropriate to the proposed after-use. There should be at least one metre of ground cover over the remains of any structures.

26 Roadway stoppings and dams

Stoppings intended to retain shaft fill should be sited as close as possible to the shaft side as operating and winding conditions permit. Normally the endwall nearest the shaft should be no further away than a distance equal to the height of the roadway. The roadway should be cleared of equipment, timber and obstructions, but side and roof supports should be left in and the floor should be cleared down to clean rock. The stopping may be constructed of hardstone from the mine or hardcore rubble packed tight to the strata at roof and sides. An endwall of brick or masonry is required at the shaft side; the inbye end can either have another brick or masonry wall, or can be simply a bank of material at its angle of repose slope (the length of the stopping being extended accordingly).

To minimise the possibility of the stopping becoming sealed and so acting as a dam to retain water, pipes or drainage layers of gravel filter material should be incorporated. Pipe ends should be protected by gravel filter material and at least one of the drainage pipes through the stopping should be placed near the roof. Any pipes used for ventilation during construction can be retained to provide additional drainage.

Roadway dams should be constructed in concrete or brickwork on the same principles as shaft plugs but, by definition, dams are intended to be watertight. The roadway should therefore be cleared of all obstructions, lagging and loose ground. Roof supports should normally be left in, as also will substantial timbering, but should be subject to preliminary grout injection to the surrounding strata and sealed. The end shutters, which must bear the full weight of the dam, may be of brick or masonry walling or of concrete, the latter being the choice depending on the situation and the availability of materials. After the completion of concreting the final grout injection should be made and the surrounding strata will be necessary to ensure the stability of the dam. Any temporary pipes present for ventilation purposes will require to be sealed at the shaft side.

If the dam is formed of aggregate and concrete, the finished work should be drilled and grouted to the surrounding strata.

TOWN AND COUNTRY PLANNING ACT 1990

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015/595

TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES
2000/1624

PLANNING INQUIRY UNDER SECTION 77 OF THE TOWN AND COUNTRY PLANNING
ACT 1990 IN RELATION TO THE PLANNING APPLICATION REFERENCE 4/17/9007 FOR
APPLICATION FOR DEVELOPMENT OF A NEW UNDERGROUND METALLURGICAL
COAL MINE AND ASSOCIATED DEVELOPMENT TO BE LOCATED AT

FORMER MARCHON SITE, POW BECK VALLEY AND AREA FROM MARCHON SITE TO
ST BEES COAST, WHITEHAVEN, CUMBRIA

PINS REFERENCE: APP/H0900/V/21/3271069

WCM/JT/3

Rebuttal on matters relating to the need for coking coal

Jim Truman

On behalf of West Cumbria Mining Ltd

August 2021

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1. Introduction

1.1 This Rebuttal Proof responds to the following issues raised in the Proofs of Evidence of Mr Simon Nicholas [FOE/SN1] and Dr Jonathan M Cullen [FOE/JC1] of Friends of the Earth ("FoE") and Professor Paul Ekins OBE [SLACC/PE/1], Professor Lars Nilsson [SLACC/LN/1], and Professor Stephen Haszeldine OBE [SLACC/SH/1] of South Lakes Action on Climate Change ("SLACC"):

- A. EIA data illustrates a market exists Asia for US coals
- B. Coal from the mine could be sold to Asia or Africa
- C. Basic Textbook supply-demand relationship should explain coal markets and steel production trends
- D. The new mine would lower steel costs and delay low-carbon alternatives for steel production
- E. The IEA Net-Zero by 2050 roadmap states no new coal mines are needed
- F. Scenario using the PRIMES model shows coal need basically disappears beyond 2040, but only showed Policy Scenario
- G. The Global Energy Monitor shows 79 new metallurgical coal mines are planned
- H. Compares a flattening of global supply to a forecast of seaborne metallurgical coal trade
- I. Metallurgical coal and coke are used interchangeably
- J. Coking coals are divided into groups according to impurities
- K. Some uncertainties with starting dates of the green steel projects listed
- L. Significant steel demand reductions could be achieved by material efficiencies
- M. Presents "acceptable quality ranges, but these are descriptions of index coals used for spot prices
- N. Quality table points to many positive attributes of West Cumbria Mining's coal

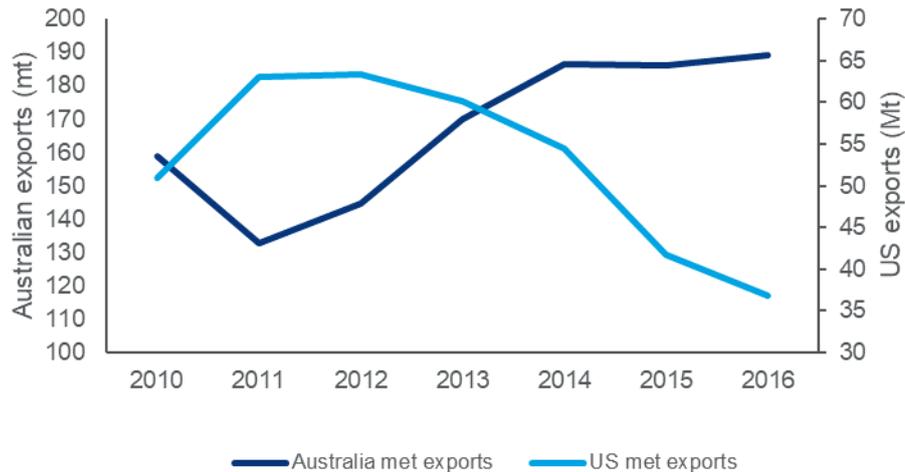
1.2 This is not intended to be an exhaustive rebuttal and this document only deals with points where I consider it appropriate and helpful to respond in writing at this stage in order to assist with the timely progress of matters at the inquiry. This does not imply that anything contained in those reports is agreed if it is not specifically rebutted. Other points at issue will be dealt with in evidence at the Inquiry.

2. Rebuttal of Evidence Simon Nicolas

POINT A – EIA DATA ILLUSTRATES A MARKET EXISTS IN ASIA

- 2.1. Mr Nicolas presents Neil Bristow's conclusions (from previous evidence) that the West Cumbria Mining operation would cause a reduction in US production of the same quality coal. I agree with Mr. Bristow's position.
- 2.2. Mr Bristow's remarks in para. 2.3 "*In my judgement, the USA would not continue to mine the same grade of coal for sale to other countries because a) there is no proven market for them to do that, and b) because shipping to alternative major steelmaking countries in Asia and India involves such high transport costs that it would question the economic viability. Instead, the most likely outcome is that there would be a corresponding reduction in the extraction of this coal.*" (emphasis added)

- 2.3. Mr. Nicolas states in para. 2.4 *“In my opinion, this conclusion by Dr. Bristow is demonstrably incorrect. Official U.S. federal government data supports my assertion (see section 3 below). Based on this data, it is my opinion that the opening up of a new metallurgical coal mine in the U.K. will not lead to a corresponding reduction in coal mined in the U.S.”*
- 2.4. Shipments of US coal have indeed been moving to China since that country imposed a ban on imports of coal from Australia. However, export data does not include details on the type of coal being delivered.
- 2.5. The US is primarily being called upon to replace lost volumes, which would have been supplied from Australia. Those shipments would have been low-volatile and mid-volatile coals.
- 2.6. However, I am aware that Arch Resources and Coronado Global Resources have shipped some high-volatile A to China since the ban commenced in October 2020 (after Dr Bristow’s statement). In total, the US is exporting at the annualized rate of 8.8 Mt for 2021 (as of H1). In our estimate, high-volatile A only represents about 11% of that volume.
- 2.7. I also understand that 2021 represents a period when Chinese steel mills are under great stress to find enough coal to meet demand and produce hot metal, with the reduction of imports from Australia. Thus, they are in a situation where they are apt to include “less traditional” coals in their blends.
- 2.8. I do not expect the Chinese ban on Australian coal imports to be a long-term feature in the seaborne metallurgical market. Therefore, these shipments do not represent a long-term opportunity to that region.
- 2.9. Mr. Nicolas states in para. 3.20 *“I do not challenge the notion that Cumbrian coal may be more cost competitive in Europe than U.S. metallurgical coal. However, this in no way guarantees that U.S. coal will stay in the ground if Cumbrian coal is mined. U.S. metallurgical coal can be redirected into alternative markets.”*
- 2.10. The US serves as the “swing supplier” to the seaborne market, filling in with tonnage when supply issues arise from other supply regions and contracting when that supply returns.
- 2.11. After the major Queensland flooding in 2010-2011, Australian coal production and exports were greatly reduced. The US increased exports to fill this shortfall in the market. As the Australian production (which was much lower cost than US) returned, US exports ebbed. Mines either closed or reduced output. This event provides a clear example of low-cost production entering the market and replacing or substituting for the higher-cost US coal.
- 2.12. The following graph shows the substitution of US coals for those from Australia and how, as lower-cost Australian coal re-entered the seaborne trade, US exports contracted accordingly. US producers did not just continue to sell the coal to other locations.



Source: GTT Trade, Wood Mackenzie

Figure 1 - the substitution of US coals for those from Australia

- 2.13. I consider that the same relationship would hold, as lower-cost coal from West Cumbria Mining enters the trade. Those low-cost tonnes would substitute for higher-cost tonnes from US mines (all coals of the same quality type - high-volatile A).

3. **Rebuttal of Evidence Professor Paul Ekins OBE**

Point B – Coal from the mine could be sold to Asia or Africa

- 3.1. Professor Ekins asserts that if the market were not available in the UK or Europe, the coal could be sold elsewhere, like Africa or Asia.
- 3.2. Professor Ekins states in para. 3.17 “*There is therefore no evidence I am aware of to support the conclusion that, if a market for the coal cannot be found in the UK or Europe, the mine will simply shut down, as has been asserted.²² The mine operator’s economic incentives will be to sell the coal anywhere in the world that a market can be found. Once the coal has been transported to the port at Redcar for onward shipping, there is nothing preventing the coal from being shipped to Africa or Asia, for instance, if the European market has collapsed or contracted significantly, as is likely to occur given legally-binding GHG emission reduction targets (see further discussion at section 5)*”.
- 3.3. Even if this change in destination country were to occur in the event that coking coal demand in Europe were to fall much quicker than the assessment given by Wood Mackenzie, there would still be significant savings in GHG emissions, compared to the emissions if that demand were to be filled with US high-volatile A coals.
- 3.4. Wood Mackenzie estimates delivered emissions to Japan would be around 110 kgCO₂e/t in the likely mitigated case and around 175 kgCO₂e/t in the worst case compared to about 550 kgCO₂e/t for US high-volatile A coals, an 80% or 68% reduction respectively.
- 3.5. Wood Mackenzie estimates delivered emissions to India would be around 80 kgCO₂e/t in the likely mitigated case and around 180 kgCO₂e/t in the worst case compared to about 550 kgCO₂e/t for US high-volatile coals, an 85% or 67% reduction.

Point C – Basic textbook supply-demand relationships should explain coal markets and steel production trends

- 3.6. Professor Ekins first illustrates the fundamentals of supply and demand, stating that the following exposition of basic market economics can be found in any economics textbook (para. 3.1): *“Markets work by balancing supply and demand through the market price. The law of demand, for which there is very extensive evidence for normal goods (which include coking coal) states that more of a good is demanded at a lower price than at a higher price, which leads to the downward sloping demand curve D1 in Figure 1 below. The demand is satisfied through the supply of the good in question, with the marginal cost of production increasing as more of the good is supplied (because the cheapest means of production are employed first), so that there is an upward-sloping supply curve, shown by S1. The market price is set at the point where the two curves cross, p_1 , resulting in the market quantity supplied and demanded q_1 , in Figure 1”*.
- 3.7. I agree that this relationship is fundamental and similar market behaviour would result for a single good in a fairly contained environment.
- 3.8. Professor Ekins then adds how the above relationship would steer steel and coal economics. However, the economics and supply-demand relationships are extremely more complicated than this description and diagram imply.
- 3.9. In a more normal market environment (prior to the China ban on Australian coal), the price of coking coals was driven by the supply, demand and price of premium low-volatile coal from Queensland, Australia. The price of other metallurgical coals is determined by the relationship of individual coals to that “marker”. Therefore, the availability or tightness of that product largely determined the price producers of high-volatile A would be able to achieve for their tonnes.
- 3.10. The price European steel mills pay for US coals has typically been determined using the price Australian mines have been able to obtain from Japanese, South Korean and Chinese buyers (including mills and traders).
- 3.11. Since the China ban on Australian coal began in late 2020, the price relationships and drivers have become increasingly complex. As China’s need for metallurgical coal immediately increased by 35 Mtpa (the amount they were getting from Australia), mills there were willing to pay much more for replacements. The price for Chinese domestic low-volatile metallurgical coal has risen by over US\$300/t since the ban started. The price for seaborne coal (to replace the Australian coal) has climbed by roughly \$US230/t during the same period. These prices are still climbing as of late August.
- 3.12. Basic economics from the Ekins-provided example would dictate with such huge coal price increases, the demand for steel in China should have fallen sharply. Instead, steel consumption has remained stable, as illustrated by monthly hot metal production, which has remained rangebound between 72.0 Mt in November 2020 to 78.2 Mt in May 2021.
- 3.13. Over the period of the China ban on Australian coal (October 1 to Aug 26), the Chinese domestic low-volatile price has increased 179% and the price of low-volatile seaborne coal delivered to China has increased 164%.

- 3.14. Meanwhile, when the China ban was implemented, Australian producers found themselves with extra coal to place and the low-volatile price fell to under US\$100/t over a few weeks from around US\$135/t.
- 3.15. Most contracted hard coking coal in the seaborne market is tied to an index price for the Australian low-volatile coal. Three key companies estimate the daily spot price of coal. Then for each quarter, the contract price between steel mills and producers is set as the average of those spot prices over the previous three-month period (with a one-month lag).
- 3.16. Though some companies outside of Australia were earning good profits from the high-priced tonnes, their contract tonnes, which were tied to the Australian spot index, were obtaining very low prices.
- 3.17. There are also indexes for the spot price for US coals, including high-volatile A. However, when the price of Australian coal fell in the area of US\$100/t, for spot purchases mills outside of China bought this coal instead of vessels from the US coal. Then the daily spot price estimates for US indexes were heavily weighted on high-priced sales China.
- 3.18. As the price of US coals climbed, European mills found they could “swap vessels”. The Australian price was extremely low and their contract coal price with US producers was extremely high. So, a steel company could buy a vessel of low-priced Australian coal and allow the US producer to sell what was originally contracted to be delivered to a Chinese mill. The US coal had no restrictions on entering China.
- 3.19. Meanwhile – and importantly – the production of hot metal was broadly stable despite the extreme moves in the feedstock price.
- 3.20. Importantly, and to go back to Professor Ekins’s graph, Wood Mackenzie estimates the 2021 supply curve for seaborne metallurgical coal has a marginal cost of about US\$135/t. The current spot prices for key coal products are Australian low-volatile FOB US\$250/t and US high-volatile A FOB US\$260/t, low-volatile seaborne low-volatile delivered to China \$US380/t. Even with these astoundingly high prices, global steel production is strong.
- 3.21. The cost of coal production (on the supply curve) has minimal impact on the dynamics of present coal trade, value and steel output. Demand is not dictating a coal price at the point where it crosses the coal supply curve.
- 3.22. In a market where prices are declining, the supply cost curve provides a base, below which coal producers would be losing money on each sale.

Point D – The new mine would lower steel costs and delay the timetable for low-carbon alternatives for steel production

- 3.23. Professor Ekins also suggests the lower-cost and lower-priced West Cumbria Mining output brought into the trade would lower metallurgical coal prices enough to cause steel mills to keep blast furnaces operating and slow the transition to low-carbon options.
- 3.24. Professor Ekins states at para. 3.13 that: “A reduction in coal prices also makes steel produced by low-carbon technologies less competitive. When UK and EU steel producers are considering whether to convert to alternative lower-carbon technologies

or to instead continue to produce steel using coal, the existence of a significant, stable, long-term supply of lower-priced metallurgical coal is clearly likely to affect this decision-making, inhibiting the switch to lower-GHG-producing methods. For instance, a long-term, low-cost and stable supply of coking coal is likely to influence whether steel producers make the outlay to re-line a blast furnace, potentially prolonging high-carbon steel production at that facility for decades, or instead decide to direct those capital investments towards lower-carbon technologies. Thus, this mine is likely to have further 'lock-in effects' which discourage investment in low-carbon steel making technologies, even beyond the impacts discussed above (CD 8.23)."

- 3.25. I do not agree that the addition of one low-cost mine would make enough difference in the production costs of a BOF-BF steel operation to influence the timing of a decision on low-carbon production options.
- 3.26. Wood Mackenzie estimates the average cost of BOF-BF produced steel for a sample of 35 European mills is US\$536/t in 2021. We estimate that the coal/coke portion of that cost is US\$89/t, or 16% of the total. Since, on average, the high-volatile A component of the coal blend is 15%, then the cost for high-volatile A would be US\$13/t of steel.
- 3.27. West Cumbria Mining is expected to have very low cash costs. Hypothetically, if the company were to sell its coal at a 75% reduction to the market price and replace all the high-volatile A in a blend, that substitute would lower the high volatile A portion of the production cost of steel from US\$13/t to US\$9.75/t (a savings of US\$3.25/t crude steel). For a 1 Mtpa steel mill, the savings for changing coals would be US\$3.25 million per year.
- 3.28. For reference, the capital cost to construct a hydrogen-DRI facility with an EAF is about US\$1 billion. A few million dollars in annual savings for the steel mill would be a welcome saving, but would not impact the timing of a switch to a lower-carbon steelmaking production method.

Point E – the IEA Net-Zero by 2050 roadmap states no new coal mines needed

- 3.29. Professor Ekins notes that the IEA “Net Zero by 2050” roadmap states that beyond projects already committed, no new coal mines or mine extensions will be required. However, Wood Mackenzie forecasts, in our base case, that new coal mines and extensions will be required.
- 3.30. Professor Ekins states that: *“In 2021 the IEA produced its ‘Net-Zero by 2050’ roadmap (CD 8.16, IEA, 2021). The key conclusion relevant to this proposal is: “Beyond projects already committed as of 2021, there are no new oil and gas fields approved for development in our pathway, and no new coal mines or mine extensions are required.” (CD 8.16 IEA, 2021, p.21, emphasis added). This is the clearest possible statement from the highest global energy authority that adequate fossil fuels, including coal, are already in production, and that further supply will either contribute to global over-supply, or to the undermining of global decarbonization targets”.*
- 3.31. The most important point within this statement is that the IEA presents a number of potential future energy scenarios – or what would need to play out to satisfy a certain carbon goal. There is a fundamental difference between scenarios and forecasts. IEA sets out that definition clearly in their 2020 World Energy Outlook (see Appendix 1 of this Rebuttal).

- 3.32. The IEA states “**The World Energy Outlook does not provide a forecast of what will happen.** Instead, it provides a set of scenarios that explore different possible futures, the actions – or inactions – that bring them about and the interconnections between different parts of the system.” Included in their set of four scenarios are the following:
- 3.33. **Stated Policy Scenario** – which provides “a detailed sense of the direction in which [...] today’s policy ambitions would take the energy sector”.
- 3.34. **Sustainable Development Scenario (SDS)** – which “maps out a way to meet sustainable energy goals in full, requiring rapid and widespread changes across all parts of the energy system. This scenario charts a path fully aligned with the Paris Agreement by holding the rise in global temperatures to “well below 2°C ... and pursuing efforts to limit [it] to 1.5°C”, and meets objectives related to universal energy access and cleaner air.”
- 3.35. **The Net Zero Emissions by 2050** case examines what more would be needed beyond SDS over the next ten years to put global CO₂ emissions on a pathway to net zero emissions by 2050.”
- 3.36. The IEA further outlines the difference between forecasts and scenarios in the summary of the Stated Policy Scenario – “None of the scenarios in our Outlook is preordained: all are possible. The Stated Policies Scenario is not a forecast and it should not be interpreted or treated as such. It includes a detailed assessment of policies that have already been announced (“stated”), but it does not speculate on how these might evolve in future...A forecast would need to try to second-guess the future responses of policy makers, whether these are triggered by concerns about energy security or affordability, or by a reaction to rising emissions and their impacts...We do not give decision makers the benefit of the doubt on these future responses. Our intention in the Stated Policies Scenario is to provide a candid picture of where the energy world is heading, and thereby provoke careful deliberation and action, not to sugar-coat the Outlook with an optimistic prediction of future policy changes.”
- 3.37. I am not aware, nor have I seen, that the IEA projection of “no new mines needed” accounts for the need for a combination of different coal quality types within a blend. A mill cannot make usable coke by just using high-volatile coal. That coke would not have the strength to hold up the burden of iron ore in a blast furnace. Similarly, you couldn’t make a good coke with just low-volatile coal. High-volatile coal provides the bonding element (“the glue”) into a cokemaking blend. You need certain characteristics from a range of coal types.
- 3.38. Wood Mackenzie’s forecasting includes that element of cokemaking in determining if demand can be met. We consider existing mines will be capable of meeting global seaborne demand for hard coking coal until 2027. Beyond that year, an increasing volume of coal from new mines is needed until the year 2050, when just over 200 Mtpa of hard coking coal from projects will be required.
- 3.39. Wood Mackenzie’s base case forecast assumes that there are many hurdles to overcome before large-scale, commercial production of hydrogen-based steel will become a reality. Wood Mackenzie’s forecast is based on our professional judgement and assessment of the timing of events within this transition period enroute to a reduced carbon future.

Point F – Scenarios using the PRIMES model show coal need basically disappears beyond 2040, but only showed the Policy Scenario results.

- 3.40. In para. 7.3, Professor Ekins refers to the PRIMES model that has been used to evaluate emission cuts and future metallurgical coal needs, stating that: *“Two scenarios were modelled: A Base Scenario, which achieves the EU targets of 2030 prior to its most recent ramping up of climate ambition, and a Policy Scenario in which the now legally binding targets in the EU and UK for 2030 (55% and 65% reductions respectively), 2035 (UK 78% reduction) and net-zero emissions in 2050 (both EU and UK) are achieved.”*
- 3.41. The results of the Policy Scenario were included in Professor Ekins’ evidence.
- 3.42. In para. 7.5, Professor Ekins states *“More specifically, the use of solids (hard coal, coke) in the UK iron and steel sector drops significantly in the Policy Scenario by about 60% in the UK in the period 2015-2030, and by more than 80% by 2035, while it is eliminated completely by 2040. The picture is the same in the EU27 where the use of solids for Iron and Steel manufacturing is projected to decline by 75% over 2015-2035 and by more than 99% by 2040.”*
- 3.43. However, Professor Ekins’ evidence omitted to include the results of the Base Case. West Cumbria Mining requested the results of that evaluation.
- 3.44. Within those results provided upon request, the following was stated, *“The use of solids (hard coal, coke) in the Iron and Steel sector drops in the Base Scenario by about 46% in the UK in the period 2015-2030, by more than 65% by 2040 and ca. 70% by 2050. The shows similar trends (but slower) in the EU27 where the use of solids for Iron and Steel manufacturing is projected to decline by 30% over 2015-2035 and by more than 55% by 2050”.*
- 3.45. The Base Case therefore shows that up to 2050, nearly half the amount of metallurgical coal used in the EU 27 in 2015 will still be required by the steel industry. The cut would be deeper in the UK, where only 30% of the metallurgical coal would be needed. Blast furnaces would still be in operation and, therefore, a significant metallurgical coal market in Europe would remain.
- 3.46. Furthermore, it is important to note these are scenarios of how given assumptions and emissions restrictions would play out. Scenarios are not forecasts. Scenarios show how a certain outcome could be achieved. Forecasts include a determination of what parts are likely to be achieved and what is expected to happen.
- 3.47. Professor Ekins provides the following on page 30 *“Both scenarios present a projection, not a forecast, of the evolution of the EU energy system, transport system and GHG emissions. They do not predict how these will look in the future, but provide a model-based simulation of a possible future outlook, given the applied policy context.”*

Point G – The Global Energy Monitor shows 79 new metallurgical coal mines are planned

- 3.48. Professor Ekins states (para. 4.3): *“Despite the recent levelling-off of demand for coking coal, the Global Energy Monitor (GEM) database (see Appendix 1) shows that a large number of new mines for coking coal are still being proposed. As of 2021 there were 119 operational mines producing bituminous metallurgical coal. No fewer than 79*

new mines of this kind were being proposed, and there is no suggestion that these would 'substitute' for existing mines. Rather the GEM database suggests that they will simply add to existing reserves, while production from such mines would increase by 75% if all these proposed mines are realised (see Table 1, Appendix 1)."

- 3.49. Professor Ekins seems to be relying on a list which I believe to be a reasonably good resource but as a starting point for research. It needs further refinement.
- 3.50. The database includes 79 metallurgical coal mine projects and a review conducted pointed to some issues meaning a summation of tonnage is too simplistic.
- 3.51. The Youngs Creek mine is included in the GEM database. This is a subbituminous mine in the Powder River Basin of Wyoming in the US. This reserve does not contain any metallurgical coal.
- 3.52. Some of the mines included in the GEM database as all metallurgical will produce both thermal and metallurgical coal, therefore total mine production is not appropriate measure of metallurgical coal production. A few Australian examples from Wood Mackenzie's data include: the Maxwell mine (33% thermal), Vickery, (40% thermal), Wilton (50% thermal) Winchester (30% thermal). Two mines in Mozambique are included, Chirodzi and Zambeze, which we believe will produce 33% and 38% thermal coal, respectively.
- 3.53. The Indian mine Jamkhani is included. This deposit was purchased by Vedanta, which intends to use the output internally for aluminium smelting. This coal is not expected to enter the metallurgical coal trade.
- 3.54. In the US, many of the mines in the GEM project list are currently producing coal: Arch Resources' Leer South, Alpha Metallurgical Resources Lynn Branch and CONSOL's Innman mines. The slope to the Longview mine is presently being driven and Warrior Met Coal is on the cusp of developing the Blue Creek mine.
- 3.55. Many mines listed in the GEM data are replacements for depletions at other company mines. Part of Arch's Leer South output replaces coal from their Sentinel mine. The new operation is using the old Sentinel preparation plant. Additionally, to save on capital, the company moved a longwall from another mine called Mountain Laurel. Production from that mine was reduced as it shifted from a longwall mine to a continuous-miner operation. So, the production from a project cannot be assumed to be additional tonnes.
- 3.56. In summary, many of these mines are either in production, will replace other mines as those deplete (and not add to total seaborne trade), include thermal coal, are completely thermal coal projects or designated to serve another purpose.
- 3.57. At Wood Mackenzie, we have developed a considered approach by which we look at projects, estimate their coal quality characteristics, estimate the expected mining cost and transportation cost to the nearest port. Then, by looking at global demand, projects are brought online as demand for that coal type develops and the cost of production makes economic sense – when competing with all other similar coals globally to mills in specific countries.

Point H – Compares a flattening of global supply to a forecast increase in seaborne metallurgical coal demand

- 3.58. Professor Ekins states in para. 4.4 “As late as 2013 it was possible for experts to project further increases in the supply of coking coal, as shown by the projection of coking coal exports in Figure 4. As seen in Figure 3, this did not happen from 2016, and projections for increasing or steady coking coal use are now particularly dubious where binding emissions reduction targets exist, including in the UK and EU.”
- 3.59. Figure 3 shows that global production of coking coal levelled off. The forecast in Figure 4 shows an increase in supply.
- 3.60. However, Figure 3 is the trend of global coal production, which is dominated by Chinese output. Figure 4 is the forecast growth in seaborne metallurgical coal trade. These are completely different items.
- 3.61. In Figure 4, Alderman did not foresee the Queensland floods in 2010-2011 that slowed exports, or Cyclone Debbie that impacted 2017 exports, the China ban on Australian coal or the global pandemic in 2020. Despite these points, the forecast for 2021 seaborne trade looks to be about 320 Mst (by eyeball) – or 290 Mt. Wood Mackenzie expects 2021 seaborne trade to be 294 Mt, within 4 Mt of Alderman’s projections.

4. Rebuttal of Evidence of Professor Lars Nilsson

Point I – Metallurgical coal and coking coal are used interchangeably

- 4.1. Professor Nilsson provides the following definitions of coking coal within his evidence at para. 3.8 “*In this statement I use the terms ‘metallurgical coal’ and ‘coking coal’ interchangeably.*”
- 4.2. Wood Mackenzie does not use the terms “metallurgical coal” and “coking coal” interchangeably. Nor, do we believe this to be the norm within the industry.
- 4.3. Coking coal is used to make coke, to be fed into the blast furnace.
- 4.4. PCI stands for “Pulverized Coal Injection”. PCI is used directly in the blast furnace to replace some coke. The primary reason for this replacement is to lower the feedstock cost, as PCI coals do not need to have, and in fact should not have, coking properties, and are much less expensive.
- 4.5. The term “metallurgical coal” is an overarching grouping that includes coking coal and PCI.

Point J – Coking coals are divided into groups according to impurities

- 4.6. Professor Lars Nilsson states (para. 3.9) coking coals are divided into groups according to impurities: “*Depending on quality and impurity contents, the run-of-mine coking coal is subdivided in different quality segments: premium hard (PHCC), hard (HCC), high-volatile (Semi-HCC), semi-soft coking coal (SSCC), and Low Vol PCI (Appendix 6, pg.191).*”
- 4.7. The coking coal groupings cited above have very little to do with impurities. Premium hard coking coal, semi-hard coking coal and semi-soft coking coals are defined by their ability to make a strong coke. That measure is called CSR and the higher the number the stronger the coke. Each of these groupings can have relatively higher or lower ash, sulphur, phosphorus etc. Australian coals are known for having higher phosphorus

than US coals. Likewise, PCI can have low or high levels of impurities, but it should not have the ability to coke, when heated in the absence of oxygen.

- 4.8. Also, run-of-mine coal quality is not of importance. What matters is clean coal quality – the product’s quality when it is sold.
- 4.9. Professor Nilsson’s Appendix 6, page 98 states: “*Coking coal has a higher carbon content than steam coal, as well as a lower level of sulphur, phosphorous and alkalis (World Coal Institute 2009).*”
- 4.10. The World Coal Institute’s comments on the typical quality aspects of coking coal are reasonable, but there are many so exceptions in the trade of steam coal and coking coal. For example, most US metallurgical coals have sulphur content between 0.7% and 1%. Australia is the world’s largest exporter of seaborne thermal coal. Out of about 200 Mt of thermal exports, Wood Mackenzie estimates 181 Mt has sulphur content under 0.7%.

Point K – There are some uncertainties with the starting dates of the green steel projects listed

- 4.11. In para. 3.27 Professor Nilsson lists a number of projects planned for the near term.
 - 4.11.1. Professor Nilsson states “3.27.1 Several companies have publicly stated they will abandon their blast furnaces in favour of hydrogen direct reduction (H-DR): Thyssenkrupp (2019 company production level 12.25 Mt), SSAB (7.6), voestalpine (7.3 Mt), Salzgitter (6.9).”
 - 4.11.2. Professor Nilsson states “3.27.2 *One new production site is planned in Northern Sweden. The company H2 Green Steel plans to produce 2.5 Mtpa by 2024 and wants to increase production to 5 Mtpa by 2030 through H-DR technology (Appendix 12, Table 1).*”
 - 4.11.3. Professor Nilsson states “3.27.3 *One production site aims to use hydrogen direct reduction at its secondary steelmaking site: Liberty Steel Dunkirk. The project capacity is 2 Mtpa (Appendix 12, Table 1).*”
 - 4.11.4. Professor Nilsson states “3.27.4 *Several current BF/BOF steel mills have announced that they will start H-DR steel production: ArcelorMittal Bremen (capacity 1.75 Mt, to start in 2026)(Appendix 12, Table 1), ArcelorMittal Eisenhüttenstadt (1.75, 2026) (Appendix 12, Table 1), ArcelorMittal Dunkirk (likely to replace 1 of 3 BFs in first step, ca. 1.4 Mtpa), Liberty Steel Galati (4 Mtpa), ArcelorMittal Hamburg (0.1 Mtpa, pilot plant).*”
 - 4.11.5. Professor Nilsson states “3.27.5 *Three further projects aim at primary steelmaking without metallurgical coal: Swedish LKAB aims to start producing iron produced through H-DR in 2029 (Appendix 12, Table 1) and aims to steadily increase production up to 20 Mt in 2045. Tata Steel in the Netherlands has an operational smelting reduction pilot plant that can handle a wider range of coal grades. ArcelorMittal in France has an operational electrowinning pilot plant that runs on electricity (Appendix 12, Table 1).*”
- 4.12. Wood Mackenzie expects a number of these projects will come online later than stated above. The Liberty projects at Dunkirk and Galati are questionable, as the company is

under investigation for fraud and is in the process of trying to restructure finances. Wood Mackenzie does not believe the H2 Green project in Sweden is funded, therefore we do not assume this project will arrive on the schedule presented.

- 4.13. I believe ThyssenKrupp and Salzgitter are the only two companies in Europe, which presently do not use high-volatile coal in their blends to make coke. Therefore, a switch for these companies away from blast furnaces would not impact demand for high-volatile coking coal.
- 4.14. Professor Nilsson states in para. 3.29 “*Data gathered in the Green Steel Tracker, shows that by 2030, industrial H-DR projects in the EU will provide a total capacity of over 10 Mt of primary steel production.*”
- 4.15. Wood Mackenzie expects 9.1 Mt of H-DRI capacity in Europe by 2030. At 80% utilisation and a 10% yield loss from metallics to crude steel production, that represents 6.5 Mt of crude steel produced using H-DRI. Production of 6.5 Mt is 4% of total EU crude steel production in 2029.

5. Rebuttal of Evidence of Professor Lars Nilsson and Dr Jonathan M Cullen

Point L – Significant steel demand reduction could be achieved by material efficiencies

- 13.1 Scenarios for emissions reductions include steel demand reductions, largely on material efficiencies.
- 13.2 Professor Nilsson states in para. 3.23 “*The IEA has found that “[p]ursuing a suite of material efficiency measures along supply chains reduces global steel demand by around a fifth in 2050.*”
- 13.3 Dr. Jonathan Cullen states in para. 7.3 “*Early material efficiency research (Allwood et al, 2010) [FOE/JC1/01] explored six material efficiency strategies: using less metal by design; reducing yield losses; diverting scrap; re-use with no melting; longer life products; reducing final demand. Modelling of these strategies suggested that global steel demand in 2050 could feasibly be reduced by more than 40%, from 2,400Mt to 1,400Mt, allowing a 50% reduction in emissions to be achieved.*”
- 13.3 Wood Mackenzie believes any efficiencies in steel demand achieved will be offset by increases in demand to support low-carbon energy and steel facilities, such as: the large fleet of wind turbines, structures to support solar panels, new EAF construction, new DRI facilities and piping to transport hydrogen and CO2.

6. Rebuttal of Evidence of Professor Stewart Haszeldine OBE

Point M – Presents “accepted” quality ranges, but these are the descriptions of index coals used for spot prices

- 14.1 Professor Haszeldine offers evidence of the limits of sulphur content in coking coal, stating (para. 5.3): “*The Edinburgh Report (Fig 4, Fig 5, Fig 6], Appendix 1,) confirmed that 1.0-1.1% sulphur content is at the uppermost end of an accepted range typical of US HVA coal. Pages 18-23 of the Edinburgh Report show numerous tables which are summarised below.*”

YEAR	SOURCE	Sulphur %
1997	Baruya and Mc Conville	0.6 – 1%
May 2021	Fig 3. S&P Platts Specifications Guide: Global Metallurgical Coal	0.95%
Feb 2021	Fig 4. HIS Markit’s Coking Coal Marker Price Methodology and Specifications (US HVA coking coal export market)	1% max
May 2021	Fig 5. Argus Ferrous Markets Guide Methodology and Specifications Guide. (and no coking coal globally was associated with a higher figure)	Up to 1.1%
2002	Fig 6. 3 Coal seams in the Appalachian Region (Ruppert, Tewalt and Bragg)	.99% 1.05% 0.66%

2012	Fig 9. Source: (Gulyaev, Barskii and Rudnitskii,	< 0.7
2018	Figure 1 Specifications for ‘Premium Hard Coking Coal’. (Metal Bulletin,)	Base 0.5, max 1.1%
2021	Platts coal quality data display tree: iron ore and metallurgical coal, with >0.8% defined as very high sulphur	0.7 to 1.0%

14.2 Of these references (Baruya and McConville, S&P Platts, IHS Markit, Argus, Metal Bulletin and Platts), none are intended to represent the absolute limits for sulphur that steel companies would use at their coke plants. These “price discovery” companies make daily estimates of the spot price of various metallurgical coal types in the market. Their quality descriptions cited here are definitions of each company’s index coal, a marker to use as a baseline. Their methodology and materials also include descriptions of how much a penalty or premium to apply from these coal types for different levels of ash, sulphur etc. These are not coke makers limits or specifications.

14.3 The reference (in the above table) to Figure 6.3 to the 2002 report “Coal Seams in the Appalachian Region” has practically no relation to the issue at hand. This report by the USGS provided average quality figures for three seams. The 0.99% sulphur in the table above is the average for the Fire Clay seam. I am not aware of any coal from the Fire Clay used for metallurgical purposes. The second value (1.05%) is for the Pond Creek seam. I know of one operation selling this coal as metallurgical coal. It may represent 0.3 Mt of output out of a total metallurgical coal production of about 60 Mt and I believe it to be a high-volatile B coal. The third value (0.66%) is for the Pocahontas No. 3 Coal, which is a well-known US low-volatile coal.

Point N – Quality table also points to many positive attributes of the West Cumbria Mining’s coal

15.1 Professor Haszeldine also presents a table of general quality ratings for washed, high-volatile, bituminous U.S. coking coal.

[Abbreviations and symbols: A/B, acid-to-base ratio; °C, degrees Celsius; CSR, Coke Strength after Reaction; daf, dry ash-free basis; ddpn, dial divisions per minute; °F, degrees Fahrenheit; FSI, Free Swelling Index; HGI, Hardgrove Grindability Index; max., maximum; red., reducing environment; R_{v,max}, maximum vitrinite reflectance in oil; ST, softening temperature; VM, volatile matter; %, percent; >, greater than; ≥, greater than or equal to; <, less than; ≤, less than or equal to. Note that these data are not applicable to unwashed coal or coal for use outside of the United States.]

Property	Poor to marginal	Fair to good	Vary good to excellent
VM (% daf)	>40	>34 and <40	31–34
Ash (% dry)	>8	>6 and <8	<6
Sulfur (% dry)	>1.3	>0.8 and <1.3	<0.8
Oxidation (%)	<87	>87 and <94	≥94
FSI	<6	>6 and <8	>8
Max. fluidity (ddpm)	<5,000	>5,000 and <20,000	>20,000
Plastic range (°C)	<75	>75 and <95	>95
Dilatation (%)	<100	>100 and <180	≥180
Sole-beated oven (%)	>12	-12– -20	<-20
HGI	<42 or >80	≥42 and <55	>55 and <80
Ash fusion ST (°F, red.)	≤2,250	>2,250 and ≤2,575	>2,575
Ash A/B ratio	<3.5	≥3.5 and <6.0	≥6.0
P ₂ O ₅ in the ash (%)	≥1.2	>0.5 and <1.2	≤0.5
Mean R _{v,max} (%)	≤0.82	>0.82 and ≤0.98	>0.98
Inert content (%)	<15 or >35	15–20 or 30–35	>20 and <30
CSR (%)	<45	≥45 and ≤56	>56

Figure 7 General quality ratings for washed, high-volatile, bituminous U.S. coking coal. Source: summary table from (Trippi et al., 2021), originally compiled by (DeVanney and Mitchell, 2015)

- 6.1. I believe this to be a reliable source of information and have had discussions with DeVanney (one of the original compilers of the data) in the past about coking coal qualities.
- 6.2. Professor Haszeldine proceeds to focus on the sulphur content, which I assume will fall at the boundary between “Poor to Marginal” and “Fair to Good”.
- 6.3. However, the same table can also be used to point out the positive aspects of the proposed coal.
- 6.4. The ash content of the West Cumbria Mining’s output is expected to be under 5% and possibly as low as 3.5%. This level falls in the category of “Very good to excellent”. Typical Australian coals have ash content between 10% and 10.5%. US coking coals from Southern Appalachia have ash contents at similar levels to Australian coals. The ash content in Central Appalachian coking coals fall in the area of 7% to 8%. Penalties for high ash or premiums for low ash are common in contracts for coking coal purchases.
- 6.5. The average FSI for the West Cumbria Mining coal is expected to be just over 8, which is in the category of “Very good to excellent”. FSI is a very basic test, which indicates if the coal will make a good coke.
- 6.6. West Cumbria Mining’s production will have fluidity over 30,000 ddpn. This characteristic is also in the “Very good to excellent” range. Most laboratory testing equipment “maxes out” at 30,000 ddpn and for high-volatile coals, cokemakers want this value as high as possible. Coals with high fluidities in the blend gives cokemakers the flexibility to include a wider range of other coals in the blend. It is a very sought-

after property. High-volatile A coals have high fluidities and that is the reason they are often valued in excess of the price of Australian premium low-volatile coking coal.

- 6.7. Dilatation % is a measure of the plastic properties of coking coal. West Cumbria Mining's production is expected to have a dilatation of 202%, which is well into the "Very good to excellent" category. Typically, high volatile coals have dilatation measurements that can range between <100 to >200. Medium-volatile coals usually have dilatation measurements between 100 and 200. Low-volatile coals are usually less than 100 (in the poor range). Cokemakers want strong high-volatile coals with good dilatation to balance low-volatile coals. They usually target about 150% for the total blend.
- 6.8. Mean Ro Max is an important measurement. It is generally referred to as reflectance and, to simplify, is a measure of how shiny a coal is. The more light a coal reflects in a microscope, the higher the number. For high-volatile coals, most cokemakers consider coals greater than 1.0% Ro Max to be high-volatile A. West Cumbria Mining's coal is expected to have an Ro Max of 1.02%, which is "Very good to excellent" according to the chart and to be a high-volatile A coal.
- 6.9. All coke is made using a blend of coking coals. In an ideal world, coke would be made from nice mid-volatile coals. However, the geological deposits are varied in qualities. I do not know of a single coke plant that uses only one coal to make coke, nor have I been aware of one during my career. Cokemakers purchase a variety of coals to blend, each of which usually have a combination of good and less-attractive properties. The science of blending allows cokemakers to arrive at a mix suitable to make a strong coke for the blast furnace.
- 6.10. In my judgement the low ash, strong fluidity, high reflectance and excellent dilatation of the West Cumbria Mining coal are attractive attributes. The higher sulphur level of the product could be blended with low-sulphur coals, such as those from Australia, with sulphur content typically between 0.5% and 0.6%, to arrive at a reasonable quality for the blend. And beyond the blend, sulphur removal is also possible on the "hot metal side" of a steel mill.

7. Conclusion

- 7.1. The Proofs of Evidence of Simon Nicholas and Dr Jonathan M Cullen Haszeldine of Friends of the Earth ("FoE") and Professor Paul Ekins OBE, PhD, Professor Lars Nilsson Msc, PhD, and Professor Stephen Haszeldine of South Lakes Action on Climate Change ("SLACC") included a number of disputable points.
- 7.2. These points broadly included using customs export data to draw conclusions beyond its limits, assuming the most fundamental textbook example of supply-demand would govern metallurgical coal market trends, that the West Cumbria Mining project development would lead to delays in the deployment of low-carbon production methods.
- 7.3. The Proofs of Evidence show a number of green steel projects within the EU area. Wood Mackenzie considers the commissioning dates of some of these projects are likely to be delayed later than indicated.
- 7.4. The Proofs of Evidence present various scenarios to achieve different emissions reductions over time. However, these are all scenarios that illustrate a method or path to reach a certain goal. Scenarios differ from forecasts, which show an expectation of

what changes might really come to fruition, given advancements of industrial processes to a full commercial scale.

- 7.5. The scenarios in the Proofs of Evidence determine much reduced levels of coal use in blast furnaces in the EU and UK. Wood Mackenzie's base case is a forecast of significant steel making and coal need over the period to 2049. It illustrates a continued need for metallurgical coal in the process of making steel in the region.
- 7.6. Lastly, a table provided in the Proofs of Evidence shows the quality ranges for, basically, poor, to good, to excellent high-volatile coking coals. The expected quality of the coal produced by West Cumbria Mining includes many in the "Very good to excellent range". We consider these characteristics will be attractive to cokemakers for making coal blends.

SIGNED: *Jim Truman*

DATE: August 31, 2021

Town And Country Planning Act 1990

Town And Country Planning (Development Management Procedure) (England) Order
2015/595

Town And Country Planning (Inquiries Procedure) (England) Rules 2000/1624

Planning Inquiry Under Section 77 Of The Town And Country Planning Act 1990 In Relation
To

The Planning Application Reference 4/17/9007 For Application For Development Of A New

Underground Metallurgical Coal Mine And Associated Development To Be Located At

Former Marchon Site, Pow Beck Valley And Area From Marchon Site To St Bees Coast,

Whitehaven, Cumbria

PINS REFERENCE: APP/H0900/V/21/3271069

APPENDIX – WCM/JT/4

This is the Appendix marked WCM/JT/4 referred to in the Rebuttal Proof of Evidence of Jim Truman dated 31.08.2021 on behalf of West Cumbria Mining Ltd

This is Appendix 1 referred to in the Rebuttal Proof of Jim Truman
dated 31 August 2021

THE TEXT IN RED DENOTE EXTRACTS QUOTED IN THE REBUTTAL PROOF; THE NUMBERS RELATE TO THE PARAGRAPH NUMBERS OF THE PROOF.

<https://www.iea.org/reports/world-energy-model/stated-policies-scenario>

The source of 3.36

World Energy Model

Report extract

Stated Policies Scenario

Is the Stated Policies Scenario an IEA forecast? (3.36)

None of the scenarios in our *Outlook* is preordained: all are possible. The Stated Policies Scenario is not a forecast and it should not be interpreted or treated as such. It includes a detailed assessment of policies that have already been announced (“stated”), but it does not speculate on how these might evolve in future.

A forecast would need to try to second-guess the future responses of policy makers, whether these are triggered by concerns about energy security or affordability, or by a reaction to rising emissions and their impacts.

We do not give decision makers the benefit of the doubt on these future responses. Our intention in the Stated Policies Scenario is to provide a candid picture of where the energy world is heading, and thereby provoke careful deliberation and action, not to sugar-coat the *Outlook* with an optimistic prediction of future policy changes.

The Stated Policies Scenario is also a valuable tool to assess some uncertainties raised by the global pandemic and economic crisis. Examples are the lower energy efficiency savings due to lower sales of new vehicles or replacement of old and inefficient appliances and impact of teleworking on future energy demand in buildings and transport.

To understand the impact of a longer pandemic and stronger economic turmoil, we developed the Delayed Recovery Scenario (DRS). This scenario illustrates perfectly the scenario-based approach of the World Energy Outlook: the DRS retains the initial policy assumptions of the STEPS while public health and economic assumptions differ.

<https://www.iea.org/reports/world-energy-model/stated-policies-scenario>

The same page as above – the source of (3.33)

The aim of the Stated Policies Scenario is to provide a detailed sense of the direction in which existing policy frameworks and today's policy ambitions would take the energy sector out to 2040. Previously known as the New Policies Scenario, it has been renamed in WEO 2019 to underline that it considers only specific policy initiatives that have already been announced.

In aggregate, these commitments are enough to make a significant difference. However, there is still a large gap between the projections in the Stated Policies Scenario and a trajectory consistent with shared sustainable energy goals – the Sustainable Development Scenario.

The policies assessed in the Stated Policies Scenario cover a broad spectrum. These include Nationally Determined Contributions under the Paris Agreement, but much more besides. In practice, the bottom-up modelling effort in this scenario requires a lot of detail at the sectoral level, including pricing policies, efficiency standards and schemes, electrification programmes as well as specific infrastructure projects.

The sorts of announcements made by governments include some far-reaching targets, including aspirations to achieve full energy access in a few years, to reform pricing regimes and, more recently, to reach net zero emissions in some countries and sectors. As with all the policies considered in the Stated Policies Scenario, these ambitions are not automatically incorporated into the scenario: full implementation cannot be taken for granted, so the prospects and timing for their realisation are based upon our assessment of countries' relevant regulatory, market, infrastructure and financial circumstances.

Where policies are time-limited, they are generally assumed to be replaced by measures of similar intensity, but we do not assume future strengthening – or weakening – of future policy action, except where there already is specific evidence to the contrary.

An inventory of the key policy assumptions available (for all scenarios), along with all the underlying data on population, economic growth, resources, technology costs and fossil fuel prices, are also available in this introduction to the World Energy Model.

<https://www.iea.org/reports/world-energy-model>

This page includes a description of the IEA model and scenarios

The World Energy Outlook does not provide a forecast of what will happen. (3.32) and (3.33 within the following paragraph)

The Stated Policies Scenario, or STEPS, which identical in design to the previous New Policies Scenario, **provides a detailed sense of the direction in which today's policy ambitions would take the energy sector.** Previously known as the New Policies Scenario, it has been renamed to underline that it considers only specific policy initiatives that have already been announced.

- **More about the Stated Policies Scenario (3.34)**

The Sustainable Development Scenario (SDS) maps out a way to meet sustainable energy goals in full, requiring rapid and widespread changes across all parts of the energy system. This scenario charts a path fully aligned with the Paris Agreement by holding the rise in global temperatures to “well below 2°C ... and pursuing efforts to limit [it] to 1.5°C”, and meets objectives related to universal energy access and cleaner air.

- **More about the Sustainable Development Scenario**

Delayed Recovery Scenario

The Delayed Recovery Scenario (DRS) is introduced this year to reflect on the uncertainties linked to the implications of the pandemic on the global economy. In this scenario, the pandemic lasts longer and the economic recovery is weaker than assumed in the STEPS. Lockdowns in various forms are much more prolonged; periodic confinements, social distancing and other restrictive measures become part of everyday life; and the public health crisis strains the ability of many governments to provide financial lifelines to households and companies, exacerbating the slump.

Net Zero Emissions by 2050 case (3.35)

The Net Zero Emissions by 2050 case examines what more would be needed beyond SDS over the next ten years to put global CO₂ emissions on a pathway to net zero emissions by 2050. It is in line with the pathways used by the Intergovernmental Panel on Climate Change for the Special Report on Global Warming of 1.5 °C (IPCC SR1.5)

TOWN AND COUNTRY PLANNING ACT 1990

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015/595

TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES
2000/1624

PLANNING INQUIRY UNDER SECTION 77 OF THE TOWN AND COUNTRY PLANNING
ACT 1990 IN RELATION TO THE PLANNING APPLICATION REFERENCE 4/17/9007 FOR
APPLICATION FOR DEVELOPMENT OF A NEW UNDERGROUND METALLURGICAL
COAL MINE AND ASSOCIATED DEVELOPMENT TO BE LOCATED AT

FORMER MARCHON SITE, POW BECK VALLEY AND AREA FROM MARCHON SITE TO
ST BEES COAST, WHITEHAVEN, CUMBRIA

PINS REFERENCE: APP/H0900/V/21/3271069

**Rebuttal on matters relating to the extent to which the proposed development is
consistent with Government policies for meeting the challenge of climate change.**

CAROLINE LEATHERDALE

On behalf of West Cumbria Mining Ltd

August 2021

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1. Introduction

- 1.1. This Rebuttal Proof responds on matters relating to the extent to which the proposal is consistent with Government policies for meeting the challenges of climate change which are raised in the Proofs of Evidence of Professor John Barrett (acting on behalf of Friends of the Earth ("FoE")) [FOE/JB1] and Professor Sir Robert Watson [SLACC/BW/1] and Professor Michael Grubb [SLACC/MG/1] acting on behalf of South Lakes Action on Climate Change ("SLACC").
- 1.2. This is not intended to be an exhaustive rebuttal and this document only deals with points where I consider it appropriate and helpful to respond in writing at this stage in order to assist with the timely progress of matters at the inquiry. This does not imply that anything contained in those Proofs of Evidence is agreed if it is not specifically rebutted here. Other points at issue will be dealt with in evidence at the Inquiry.
- 1.3. Many of the points are repeated across the three witnesses, so only points that are additional to those in Professor Barrett's Proof are considered in my rebuttals of Sir Robert Watson and Professor Grubb.
- 1.4. I have grouped the main points raised by the witnesses which I wish to provide rebuttal on into a number of key issues (A – I) which are listed below.

Main issues raised by Professor Barrett

- A. Hydrogen switching is required by the steel sector to achieve the Balanced Net Zero Pathway identified by the Climate Change Committee.
- B. Cumulative emissions associated with the domestic use of the coking coal from the mine could equal 27.4 MtCO_{2e}, and international supply could result in 183.8 MtCO_{2e}.
- C. Carbon Capture and Storage (CCS) technologies are unproven.
- D. 1% threshold (as set out by the AECOM GHG Assessment to determine significance) would be exceeded within the 6th Carbon budget.

Main additional issues raised by Sir Robert Watson

- E. Global pathways (International Energy Agency study) to net zero assumes no new coal mines.

Main additional issues raised by Professor Grubb

- F. Carbon emissions embodied in construction materials (such as concrete in the mine drifts) are materially underestimated in the AECOM GHG assessment.
 - G. Embodied carbon emissions of operational mine equipment have not been included in the AECOM GHG assessment.
 - H. Lack of certainty relating to mitigation of mine's methane.
 - I. Carbon dioxide offset schemes will not adequately offset the global warming effects of WCM methane emissions.
- 1.5. The following sections provide evidence to rebut these points.

2. Rebuttal of Evidence of Professor John Barrett

Point A: Hydrogen switching is required by the steel sector to achieve the Balanced Net zero pathway.

2.1. In paragraph 3.4.6 Professor Barrett states that:

“3.4.6: To achieve the Balanced Net Zero Pathway, the UK steel industry would need to undergo substantial fuel-switching to hydrogen feedstocks in the near future”.

2.2. Reference to the Climate Change Committee’s (CCC’s) analysis¹ of the manufacturing and construction sector indicates that the CCC’s Balanced Net Zero Pathway (BNZP) assumes only a limited role for hydrogen fuel switching in the steel sector.

2.3. Table 1 under paragraph 5.15 of my Proof of Evidence summarises the CCC’s assumptions regarding fuel switching to hydrogen showing that it plays a relatively small component of the abatement assumed within the CCC’s BNZP modelling for the steel sector (0.6MT reduction out of a total of 10.9MT).

2.4. Carbon Capture and Storage (CCS) is however identified as providing a reduction of 3.3MT, the second highest source of abatement.

2.5. It is therefore incorrect to assume that substantial hydrogen switching is a prerequisite of the BNZP with a consequent implication for demand for coking coal.

Point B: Cumulative emissions associated with the domestic use of the coking coal from the mine could equal 27.4 MtCO_{2e}, and international supply could result in 183.8 MtCO_{2e}

2.6. I have already set out in my main proof of evidence why GHG emissions from the use of coke produced from coking coal mined by WCM are not considered to form part of the environmental effects of the Proposed Development for the purposes of EIA. Nevertheless, for completeness and notwithstanding my position on this issue, I will also respond to Professor Barrett’s quantification of these emissions on a without prejudice basis.

2.7. Professor Barrett sets out the analysis underpinning this conclusion in paragraphs 7.1 to 7.4, as follows:

“7.1. Coking coal has an emissions intensity of 3,165.2 kgCO_{2e} per tonne. By contrast, thermal coal for electricity generation has an intensity of 2,252.3 kgCO_{2e}/tonne”

“7.2. The proposed mine would have an output of 2.78 million tonnes metallurgical coal per annum, with 360,000 tonnes pa intended for supply of the UK steel industry. Domestic supply represents 13% of the total output.”

“7.3. Using standard conversion factors this would suggest a total of 1.14 MtCO_{2e}/pa from the combustion of coking coal supplied to the UK steel sector, and a total 7.7 MtCO_{2e}/pa as a result of the supply to the international market assuming all coal is used”

¹ Climate Change Committee, The Sixth Carbon Budget, The UK’s path to Net Zero published December 2020

“7.4. Assuming a conservative date of 2025 for production to start, by 2049, the cumulative emissions associated with the domestic use of the coking coal from the mine could equal 27.4 MtCO_{2e}, and international supply could result in 183.8 MtCO_{2e}.”

- 2.8. I note that Professor Barrett has chosen to apply the 2021 BEIS emissions factor for steel manufacture from coke. This factor is designed to reflect the existing GHG emission performance of the steel sector. Applying the 2021 BEIS factor to model future UK steel GHG emissions, in the context of economy wide decarbonisation is therefore highly conservative and unrepresentative.
- 2.9. I have noted in my proof (paragraphs 5.15 to 5.16) that the CCC have modelled through the BNZP a route to decarbonising the steel sector which assumes CCS to abate GHG emissions from steel manufacture using metallurgical coal. The emissions factor that would apply in the future would therefore be significantly smaller than the 2021 BEIS emissions factor adopted by Professor Barrett to estimate the GHG emissions from UK steel manufacture using metallurgical coal. Similar arguments would also apply to non-UK steel manufacture as other countries seek to decarbonise their economies.

Point C: Carbon Capture and Storage (CCS) is unproven.

- 2.10. Professor Barrett states that:

“Para 6.7. Globally, CCS remains unproven and not demonstrated at scale. The UK has no infrastructure to currently store carbon dioxide at scale.”

- 2.11. The underlying assertion is that CCS cannot be relied upon to abate future GHG from coke-based steel manufacturing in the UK and globally.

- 2.12. Firstly, this view is inconsistent with the independent findings of the CCC¹ who have examined the feasibility of abatement solutions on a sector-by-sector basis to develop a feasible and realistic BNZP to meet the 2050 target.

- 2.13. Specifically, on the scenarios considered and BNZP the CCC states¹ (p25 executive summary) that:

“All the scenarios are ambitious while bounded by realistic assumptions over the speed at which low-carbon technologies can be developed and rolled out, allowing time for supply chains, markets and infrastructure to scale up. They are self-consistent and recognise other priorities – for example, our energy analysis maintains security of supply, our housing analysis considers the need for flood protection and to avoid overheating, our land analysis supports the natural environment.

Based on the insights of these scenarios, we have developed a Balanced Pathway as the basis for our recommended Sixth Carbon Budget and the UK’s NDC. The Balanced Pathway makes moderate assumptions on behavioural change and innovation and takes actions in the coming decade to develop multiple options for later roll-out.”

- 2.14. In terms of CCS, in particular, the CCC have examined scenarios that exclude the use of CCS, and conclude:

“Overall, this supports our message that CCS is essential to achieving Net Zero, at lowest cost, in the UK. The importance of CCS globally further underscores the urgency of progressing CCS plans in the UK.” (p91)

2.15. The CCC¹ also reference research carried out by BEIS noting that (see page 284):

“The Energy Innovation Needs Assessment (EINAs) recently conducted by BEIS assessed these opportunities and found innovations in low-carbon manufacturing technologies including CCUS could support up to 80,000 jobs in the UK by 2050.¹⁴ These jobs would also be high quality, with wages above the UK average,”

and,

“The Energy and Innovation Needs Assessment also highlighted sectors where the UK already has a comparative advantage compared to other countries as being offshore wind, smart systems and CCUS, complemented by strength in engineering services that can be applied to CCUS, hydrogen and bioenergy.”

2.16. The underlying message is that CCS is needed to meet the BNZP, and that the UK is uniquely positioned to innovate, deliver and benefit from this technology.

2.17. The Industrial Decarbonisation Strategy² has further examined the role of CCUS³ and classified this as a “low regret technology”. The strategy identifies a role for CCUS in the next 10 years, concluding that:

“Carbon capture usage and storage playing a vital role. We expect that, in all future scenarios, around 3 MtCO₂ is the level of capture required in industry by 2030 to be on track to deliver net zero”.

2.18. To meet this challenge UK government has committed £1bn from 2021 to 2030 through the CCUS Infrastructure fund. The fund will facilitate the delivery of CCUS at four clusters, two by the mid-2020s and a further two by 2030⁴. This will enable the fund to directly support deployment of at least 3 MtCO₂ of CCUS on industrial sites in clusters by 2030 and up to 14.3 MtCO₂ by 2050.

2.19. Additionally, government commitments include:

2.19.1. Throughout the early 2020s, supporting the engineering and technical design elements of decarbonisation projects across the UK’s industrial clusters through UK Research and Innovation’s (UKRI) Industrial Decarbonisation Challenge.

2.19.2. Developing a revenue mechanism that will support business models for both industrial carbon capture and low carbon hydrogen projects.

2.19.3. Developing a carbon dioxide Transport and Storage Regulatory Investment business model. The regulatory framework will support a stable, predictable and index linked model which will underpin investment returns so that

² Industrial Decarbonisation Strategy, March 2021.

³ Carbon Capture Usage and Storage (CCUS) is an evolution of Carbon Capture and Storage (CCS) and allows for the utilisation of the captured carbon (e.g., in the food and drink industry) alongside storage. Essentially the technologies are analogies in that they remove carbon from concentrated point source emitters and avoid the emissions entering the atmosphere and contributing to global climate change.

⁴ See also HM Government, Ten Point Plan, 2020.

carbon capture can play a role in the UK's economy, supported, where needed, by appropriate levels of government intervention⁵.

- 2.20. In July 2021, BEIS announced the outcome of their phase 1 CCUS cluster review, to determine which CCUS cluster locations meet its eligibility criteria of being viable for operation by 2030⁶. The review has confirmed that all 5 submissions met the review criteria.
- 2.21. In summary, it is clear there is significant evidence base to provide confidence in the deployment of CCUS as an abatement technology under the BNZP.

Point D: 1% threshold (as set out by the AECOM report to determine significance) would be exceeded within the 6th Carbon budget

- 2.22. Professor Barrett states that:

"7.14.1. The emissions associated with the mine operations are likely to surpass the level of the UK's carbon budgets if it is to remain aligned with the legally enforceable 78% by 2035 emissions reduction target."

"7.14.2. Figure 5 indicates that by 2043 the mine's operational emissions would surpass AECOM's 1% threshold for high significance impact. If considering the embodied impact of the mine (i.e., if all coal produced for the UK market were used) this threshold is passed much sooner in 2031."

- 2.23. The AECOM analysis explained the way in which the 1% had been used by them in their work as a 'sense check'. However, the AECOM analysis has in any event been updated and superseded by the new GHG assessment appended to my proof⁷ and updates discussed further below under paragraphs 4.6, 4.7 and Table 1. This assessment shows that the operational emissions over the whole lifetime of the project have fallen significantly through the introduction of methane capture technology and other WCM commitments to mitigate GHG emissions. These emissions would then be compensated for through offsetting as part of WCM's commitment to net zero emissions over the whole project life and therefore it would be no longer valid to conclude that the project would have significant effects.

3. Rebuttal of Evidence of Sir Robert Watson

Point E: Global pathways (IEA study) to net zero assume no new coal mines

- 3.1. Professor Sir Robert Watson states that:

"5.1.1.1 The International Energy Agency (IEA) prepared a report at the request of the UK President of COP 26 creating "a comprehensive and detailed pathway, or roadmap, to achieve net-zero energy-related and industrial process CO₂ emissions globally by

⁵ See also BEIS, CCUS: an update on Business Models, 2020.

⁶ <https://www.gov.uk/government/publications/cluster-sequencing-for-carbon-capture-usage-and-storage-ccus-deployment-phase-1-expressions-of-interest/update-on-phase-1-eligible-clusters-and-phase-2-timeline#phase-1-eligible-clusters>

⁷ This update subject to some minor amendments will also be produced as part of the forthcoming Regulation 22 consultation process.

2050.” That report determined that existing sources of production of coking coal “are sufficient to cover demand through to 2050.”

- 3.2. The IEA’s conclusion on the need for additional sources of coking coal is addressed in Mr Truman’s rebuttal, which notes that it is not consistent with Wood Mackenzie’s forecasts and does not appear to take into account the need for different types of coking coal.
- 3.3. Furthermore, in addition to the points raised by Mr Truman, the IEA’s finding that a net-zero world does not need new developments of fossil fuels does not mean that there would be no benefit from developing new lower-emissions sources. There is no environmental imperative against reducing emissions from such sources, and there is no environmental benefit in ‘using up’ the coal in a higher emissions mine, rather than leave that coal in the ground and extract coal from elsewhere (such as from the WCM mine) with lower emissions.
- 3.4. Additionally, the IEA report⁸ fully recognises the ongoing requirements for coking coal to 2050. On page 126 it states:

“In the NZE, global CO₂ emissions from the iron and steel sub-sector fall from 2.4 Gt in 2020 to 1.8 Gt in 2030 and 0.2 Gt in 2050, as the unabated use of fossil fuels falls sharply. Their share of the overall fuel mix drops from 85% today to just over 30% in 2050. The steel industry remains one of the last sectors using significant amounts of coal in 2050, primarily due to its importance as a chemical reduction agent, albeit mostly in conjunction with CCUS.”
- 3.5. Thus, the IEA confirms the role of coking coal in the transition to other production methods in the longer term, even beyond 2050. I pause to observe that the European Commission has also confirmed (5 August 2021) that it “... recognises the indispensable role of coking coal during the steel industry’s transition to climate neutrality.”⁹

4. **Rebuttal of Evidence of Professor Grubb**

Point F: Carbon emissions embodied in construction materials (such as concrete in the mine drifts) are materially underestimated in the GHG assessment

- 4.1. Professor Grubb states that:

“4.9. It is not clear from this language to what extent certain aspects of the project have been included in this estimate. As is clear from the fact that the existing estimate for purchased goods and services comprises a majority of the emissions arising from the construction period, embedded emissions from materials to be used in construction may be very significant. Yet some building and infrastructure elements have not yet been designed, and it appears that these have been omitted entirely. Such emissions could thus have a significant and material effect on the overall estimates.

4.10. In particular it appears that the estimate does not include steel, concrete and other materials to be used in constructing the underground drifts, as this is not listed

⁸ International Energy Agency, *Net Zero by 2050 A Roadmap for the Global Energy Sector* (May 2021)

⁹ https://www.europarl.europa.eu/doceo/document/E-9-2021-002691-ASW_EN.html

among the aspects included in para 6.3. Chapter 5 of the ES states that during construction “Drifts will be lined with concrete to provide stability but also to seal the drifts against the inflow of water.” (CD1.83, para.5.3.13). These omissions could consequentially alter the estimate for construction emissions.”

- 4.2. In the GHG assessment appended to my proof (see Table C-3) it can be seen that the emissions from purchased goods and services during construction (45,318 T CO₂e) represent only a very small portion of the total lifetime GHG emissions in the mitigated scenario (approximately 2.4%). Although there is inevitably some uncertainty in this calculation, as the final volumes of construction materials, materials’ suppliers and precise carbon intensities of those materials are not yet known, the calculations are based on reasonable worst-case assumptions in an attempt to prevent significant underestimation even though some materials may not be fully accounted.
- 4.3. WCM can estimate the quantities of the two main materials used in construction (steel and concrete) for mine site and above ground structures and infrastructure. These estimates are based on outline engineering designs and are 3,368 tonnes of steel and 20,824 m³ (equivalent to 49,978 tonnes) of concrete. Using typical GHG factors for steel (1.8 kgCO₂e/kg¹⁰) and reinforced concrete (0.15 kgCO₂e/kg¹¹) this gives a total embedded carbon emissions from these primary construction materials of around 13,500 TCO₂e¹². This allows ~32,000 TCO₂e¹³ differential to the estimate for total construction phase works, which is a very large headroom for uncertainty.
- 4.4. The final emissions associated with the construction of the mine may be greater or lesser than this value. However, these emissions will be carefully accounted for during construction of the project using available carbon intensity data for purchased goods and services, and will be offset with Gold Standard carbon credits to ensure these indirect construction emissions will be net zero. As such, even if there was any underestimation of these emissions, it would not have made any difference in practice.

Point G: Embodied carbon emissions of operational mine equipment have not been included in the GHG assessment

- 4.5. Professor Grubb states that:

“4.13. Given the magnitude of the “purchase goods and services” figure, it appears very unlikely that concrete use for lining the drifts (if required) and laying concrete flooring, where required (as per ES Chapter 5 §5.3.73, CD1.83) has been included in this figure, in the same way this appears to have been omitted from the construction figures

4.14. Paragraph 7.6 of the AECOM Report (CD1.147) states that: “A bill of quantities of operational materials is not available. The most significant material requirement during operations is steel roof bolts. Estimates of the embodied carbon for these have been estimated. As other building and infrastructure elements have not yet been designed, this is only a partial calculation.”

¹⁰ Obtained from World Steel Association Net Zero Steel Pathway report: <https://netzerosteelproject.com/upload/1148117/documents/F5B19C8ADDA9CB51.pdf>

¹¹ Obtained from University of Bath Inventory of Carbon and Energy (ICE) v3.0.

¹² For clarity, this calculated by multiplying the material volumes in paragraph 4.3 by the appropriate emissions factors for steel and concrete presented in paragraph 4.3.

¹³ This is the rounded difference between the total construction embedded carbon estimate in paragraph 4.2 (45,318T) and the estimate for core construction materials in paragraph 4.3. (13,500T).

4.15. This gives rise to the implication that steel roof bolts are the only material that has been included in the purchase goods and services figure. Again, to the extent that significant use of concrete or other materials will be required for construction of the underground aspects of the mine, this could materially increase the GHG estimates for this phase.

4.16. Another area in which the AECOM Report appears to ignore embedded emissions is in relation to the heavy machinery that will be used during mining operations.”

- 4.6. The primary materials used during operation of the mine are steel bolts and resin capsules for mine roof support and concrete and crushed aggregate for roadways. There are also materials embedded in mining machinery used in the mine although these require very infrequent replacement in the mine’s life. WCM are able to robustly estimate the lifetime quantities of these materials based on the length of roadways and runouts in the mine and mining machinery purchased. The embedded carbon in these materials is accounted for in an update of the GHG assessment report prepared by Ecolyse¹⁴. The contribution of embedded carbon emissions during construction and operation, as a proportion of the whole lifetime GHG footprint of the mine is shown in Table 1.

Source	Whole Life GHG Emissions (MT CO ₂ e) ^a	% of Total Lifetime GHG Emissions ^a
Construction Phase Goods and Services	0.045	2.4%
Operational Phase Goods and Services	0.361	19.5%
Operational Phase (All Other Emissions Sources)	1.445	78.1%
TOTAL	1.851	100%

Figure 1 - Table 1: Embodied Carbon Emissions Contribution to Lifetime GHG Footprint

^a Data are for the Likely Mitigated Scenario; full details and calculation methodology are provided in the Ecolyse GHG Assessment to be issued for consultation in September 2021 (updated from August 2021 to include a more representative assessment of the embodied carbon of materials required in the construction and operational phases of the mine).

- 4.7. The GHG emissions embedded in materials (purchased goods and services) including construction and operations increases the total lifetime GHG footprint from 1.45 MT to 1.85 MT.

Point H: Lack of certainty relating to mitigation of mine methane

- 4.8. Professor Grubb states that:

“4.19: I note that the AECOM Report states that “methane emissions are likely to be captured and utilised from the fifth year of operation” (CD1.147 paras 7.6 and 7.7). However, I am instructed that SLACC’s legal team do not consider that any legal mechanism currently exists which would require this, and so it cannot be assumed that

¹⁴ Ecolyse (September 2021) GHG Assessment

methane capture will take place. I understand that there is a proposed condition relating to a “Mine Gas Capture Management Scheme” but that WCM have not provided any assurances as to the minimum level of Mine Gas Capture that would be achieved as part of any emissions mitigation proposals. In any event, it is unlikely that a Mine Gas Capture mechanism would be 100% effective. It would therefore appear that there is little evidence on which to assume any particular level of methane capture will occur”

4.9. The updated GHG Assessment and proof of evidence of Mr Tonks provide details on the methane capture system embedded in the design of the mine and its effectiveness. A section 106 obligation has been proposed to ensure ongoing monitoring and validation of GHG emissions from the mine and commits WCM to net zero over the whole life of the project.

4.10. This argument has been addressed.

Point I: Carbon dioxide offset schemes will not adequately offset the global warming effects of WCM methane emissions

4.11. Professor Grubb states that:

“4.20 Methane is a major contributor to climate change; the IPCC Science report approved by governments on 9th August 2021 finds that methane emissions (which have been rising rapidly, with global concentrations increased by more than 150%) account for almost a third of global temperature increase to date.³ Methane in the atmosphere has a much shorter lifetime than CO₂, so the standard measure of comparison (Global Warming Potential over 100 years, GWP-100) does not reflect its much greater relative impact on the rate of climate change over the next few decades.

4.21. Global methane emissions may be decisive in whether global temperatures exceed 1.5C in next couple of decades. Developments such as the Cumbrian mine will increase the rate of warming over the coming decades. We understand that the developers now propose to ‘offset’ methane emissions. However, almost all forms of offsets focus on avoiding, reducing or absorbing CO₂ emissions, and assess their contributions using the 100-year Global Warming Potential (GWP). They do not directly offset methane emissions. Irrespective of other concerns about offsetting, such activities would NOT substantially offset the impact of methane leakage on climate change over the lifetime of the mine; to do this would require offset volumes several times larger than offsets purchased on the basis of 100-year GWP equivalents (See footnote).”

4.12. I note Professor’s Grubb’s comments. However, the agreed international metric for reporting GHG emissions is based on the 100-year GWP. The UK’s legislated net zero target, carbon budgets, and annual reporting is therefore all presented as CO₂e based on 100-year GWP. This metric which conforms with UK policy has therefore formed the basis of our assessment and the basis for offsetting emissions.

4.13. Furthermore, and in any event, since a significant proportion (95%) of methane is to be captured and treated by the mitigation embedded in the design of the mine, the significance of the point raised by Professor Grubb is considerably reduced.

5. Conclusion

- 5.1. I consider that the rebuttal of the points made by the witnesses demonstrates that the proposed development does not affect the ability of the UK to meet the challenges of climate change.

SIGNED: *Caroline Leatherdale*

DATE: 31 AUGUST 2021

TOWN AND COUNTRY PLANNING ACT 1990

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)
(ENGLAND) ORDER 2015/595

TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES
2000/1624

PLANNING INQUIRY UNDER SECTION 77 OF THE TOWN AND COUNTRY PLANNING
ACT 1990 IN RELATION TO THE PLANNING APPLICATION REFERENCE 4/17/9007 FOR
APPLICATION FOR DEVELOPMENT OF A NEW UNDERGROUND METALLURGICAL
COAL MINE AND ASSOCIATED DEVELOPMENT TO BE LOCATED AT

FORMER MARCHON SITE, POW BECK VALLEY AND AREA FROM MARCHON SITE TO
ST BEES COAST, WHITEHAVEN, CUMBRIA

PINS REFERENCE: APP/H0900/V/21/3271069

WCM/JF/3

Rebuttal on matters relating to Landscape

John Flannery

On behalf of West Cumbria Mining Ltd

August 2021

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1. Introduction

- 1.1. This Rebuttal Proof responds to Landscape issues raised in the Proof of Evidence of Peter Radmall [FOE/PR1] on behalf of Friends of the Earth ("FoE").
- 1.2. This is not intended to be an exhaustive rebuttal and this document only deals with points where I consider it appropriate and helpful to respond in writing at this stage in order to assist with the timely progress of matters at the inquiry. This does not imply that anything contained in Mr Radmall's proof is agreed if it is not specifically rebutted. Other points at issue will be dealt with in evidence at the Inquiry.

2. Rebuttal of Evidence Peter Radmall

LVIA Visualisations

- 2.1. At paragraph 2.10 of Mr Radmall's proof, he states that the photography and visualisations are biased in favour of the mines, not covering the full extent to the changes associated with the RLF. Mr Radmall submits that had the SNF approach been followed fully 90-degree cylindrical photographs and accompanying wirelines should have been presented alongside the planar images.
- 2.2. The visualisations have been prepared using industry and appropriate photography and modelling software by a visualisation company experienced in 3D modelling. The Council did not require Scottish Natural Heritage (SNH) guidance to be followed and referred to Guidelines for Landscape and Visual Impact Assessment (GLVIA3). The visualisations included in the LVIA accord with Landscape Technical Note Type 3. There was no requirement to follow the requirements of SNH windfarm guidance as the development is not a windfarm and does not have the attributes of one - i.e. wide extent and large distances from VPs. The LVIA authors did not require their visualisation specialist to work in accordance with SNH guidance but in accordance with GLVIA3 which the photographs and visualisations do. As per my proof (at paragraph 2.8), I consider that the photomontages have been prepared accordingly and are appropriate for the intended purpose and anticipated users of the visualisations, and the likely levels of effect.

Proposed Supplemental Viewpoints

- 2.3. The approach adopted in the LVIA presents the visual assessment against grouped visual receptors. e.g. residents along a road, Groups of house to the north, recreational routes – i.e. coast to coast path, road users etc. Therefore, I consider that the visual receptors around the RLF are adequately represented within the LVIA and the relevant levels of effect can be discerned.
- 2.4. Mr Radmall has included five supplementary visualisations (S1 to S5) all within the Pow Beck Valley. They illustrate the view of the RLF including the loading building, offices, and the access point building. are extremely close to the development and the proof records 75m for the three closest and 0.5 and 1km for other two. The first three are so close that they require two 90 degree images. I consider that including these viewpoints in proximity to the RLF is not representative of the effects on the users of the Coast to Coast Path. They reflect the experience of the user for a short section of the route, whilst at other locations when approaching the RLF views will be filtered to a degree or screened by topography or vegetation.

- 2.5. I agree with the levels of effect predicted by Mr Radmall for his supplementary viewpoints S1, S2 & S3. However, I consider that for S3, the effect would reduce from major to moderate by year 15 due to screening provided by the mitigation planting. I consider the effect at year 1 for S4 will be moderate and significant and not major/moderate as predicted by Mr Radmall. At year 1, buildings would be screened or partly filtered by intervening trees at this viewpoint. This is not illustrated in the supplementary visualisation and buildings appear to be in front of the existing trees. The larger building would be seen against a vegetated background and would not cross the horizon. At year 15, mitigation planting would integrate the buildings to a small degree and screening would increase as trees become more mature.
- 2.6. S5 has been selected by Mr Radmall to represent views from the National Cycleway 72. This is a dismantled railway line which appears heavily vegetated. Mr Radmall appears to have found a gap which permits a view of the RLF and made a judgement on the overall effect on users of the cycleway. I consider there would be a moderate effect at the location of the VP where there is a gap in vegetation along the disused railway. However, this appears not to be representative of views towards the RLF along the route which are likely to be filtered and screened. I consider that overall the effects on users of the cycleway is minor as reported in the LVIA.
- 2.7. The buildings in the supplementary visualisations are shown as a single dark grey tone, albeit slightly transparent, against the existing view without any rendering to show materials. This gives them more prominence than in reality. The photomontage for viewpoint 12 within the LVIA, includes a representation of the appearance of the building if clad in material in character with a rural setting. There does not appear to be any adjustments in the tone of the buildings to take account of distance, again making them appear more prominent. In summary, I consider that the choice of viewpoints in terms of proximity and the method of illustrating the visualisations are not representative of the actual impacts that will arise.
- 2.8. Mr Radmall states in his proof that there is no evidence in the LVIA to support a reduction in the level of effect to moderate at year 15 from VP4 Group 5 (Scattered dwellings North of Sandwith) (see paragraph 3.24). The relevant photomontage for year 15 is shown on LVIA App 10b visuals. This replaced an earlier version labelled 10b PM15. The visualisation at year 15 clearly demonstrates an increase in the growth and the screening/filtering of views of the buildings from year 1. The reduction in level of effect at year 15 therefore seems reasonable.

Effectiveness of Mitigation

- 2.9. Paragraphs 5.2 – 5.8 of Mr Radmall's proof consider the sensitivity of the design. Whilst they acknowledge that several design features help to mitigate the potential for adverse landscape and visual effects, they also question the effectiveness of some of the mitigation that has been proposed and query why alternative or additional steps could not have been taken to mitigate these effects further.
- 2.10. I have investigated this point. The ability to mitigate the landscape and visual effects of the RLF any further were restricted by the fact that the area in which the facility sits is located within Flood Zone 3. Considerable discussions were held with the Environment Agency and Cumbria County Council in terms of what was feasible and permissible given the flood risk constraints, and the outcome of these discussions was the mitigation planting included on the plans. This amounted to a linear tree belt east of the existing track which would provide a degree of screening when viewed from the west. For this reason, it was not possible to provide further planting surrounding the

facility which might have helped to further integrate the buildings into the landscape. Further restrictions on the tree belt were also required by Network Rail in terms of the species which could be planted within 10m of the outside rail. Acceptable species are generally small leaved but can ultimately become tall specimens.

- 2.11. Mr Radmall also questions why a more comprehensive mounding scheme could not be achieved on the Marchon site (see paragraph 5.8). I am not sure why he asserts that the proposal is not comprehensive. The location of the mounds reflects the location of the most sensitive receptors and takes into account where existing topography outside of the site already provides effective screening. The mounding envelopes the site providing screening to the north to mitigate effects on the coast and residential receptors at Greenback and Mirehouse, screening along the High Road for residential receptors and screening to the south to mitigate effects to residential receptors at Sandwith. As an example of how the design of the proposal and this mitigation evolved, mounding to the south of the site was increased in height to provide better screening of the proposed carpark and office buildings following public consultation and feedback. The slope and profile of the mounding is much more naturalistic to the outside of the site where it interfaces with the surrounding landscape (as Mr Radmall recognises at para. 4.19 of his proof). It is not just the mounding which provides screening, tree planting will provide further screening as this matures and as illustrated on the year 15 photomontages. In terms of being able to choose a lower ground level to lower the effective heights of the domes. There was a balance to be struck between the very marginal landscape and visual benefit this would give rise to, against the potential negative environmental effects of excavating deeper than necessary and having to dispose of unsuitable contaminated surplus material in landfill and transporting this material off the site.
- 2.12. In summary, I consider that considerable effort has been made to avoid and mitigate landscape and visual effects by the use of effective mounding in combination with planting at the Marchon site. In terms of the RLF site, the opportunity to include further planting or design mitigation was restricted due to flood risk and rail restrictions and the operational requirements of the RLF. However, the planting that has been proposed will eventually provide a degree of screening to visual receptors when viewed from the west.

Impact on St Bees Heritage Coast

- 2.13. In paragraphs 4.38 and 4.39, Mr Radmall's proof concludes that a moderate effect would arise on the St Bees Heritage Coast, which is not significant, and such an effect would not compromise the essential purpose or character of the Heritage Coast as currently designated. This concurs with my own judgement and the conclusions within the LVIA. The ZTV within the LVIA indicates that, theoretically, the tops of the domes might be visible from parts of the Heritage Coast. There is a ridgeline which runs north south across the Heritage Coast (see plan illustration below) and it is this high ground which determines visibility. There is no visibility on the side of the slope facing the coastline, which is arguably the more sensitive part. The areas with potential visibility are landward facing. Therefore, it is likely that the only areas where there might be dual visibility of the actual coastline and the top of the domes is along this ridgeline and this would require a 180degree turn in direction.

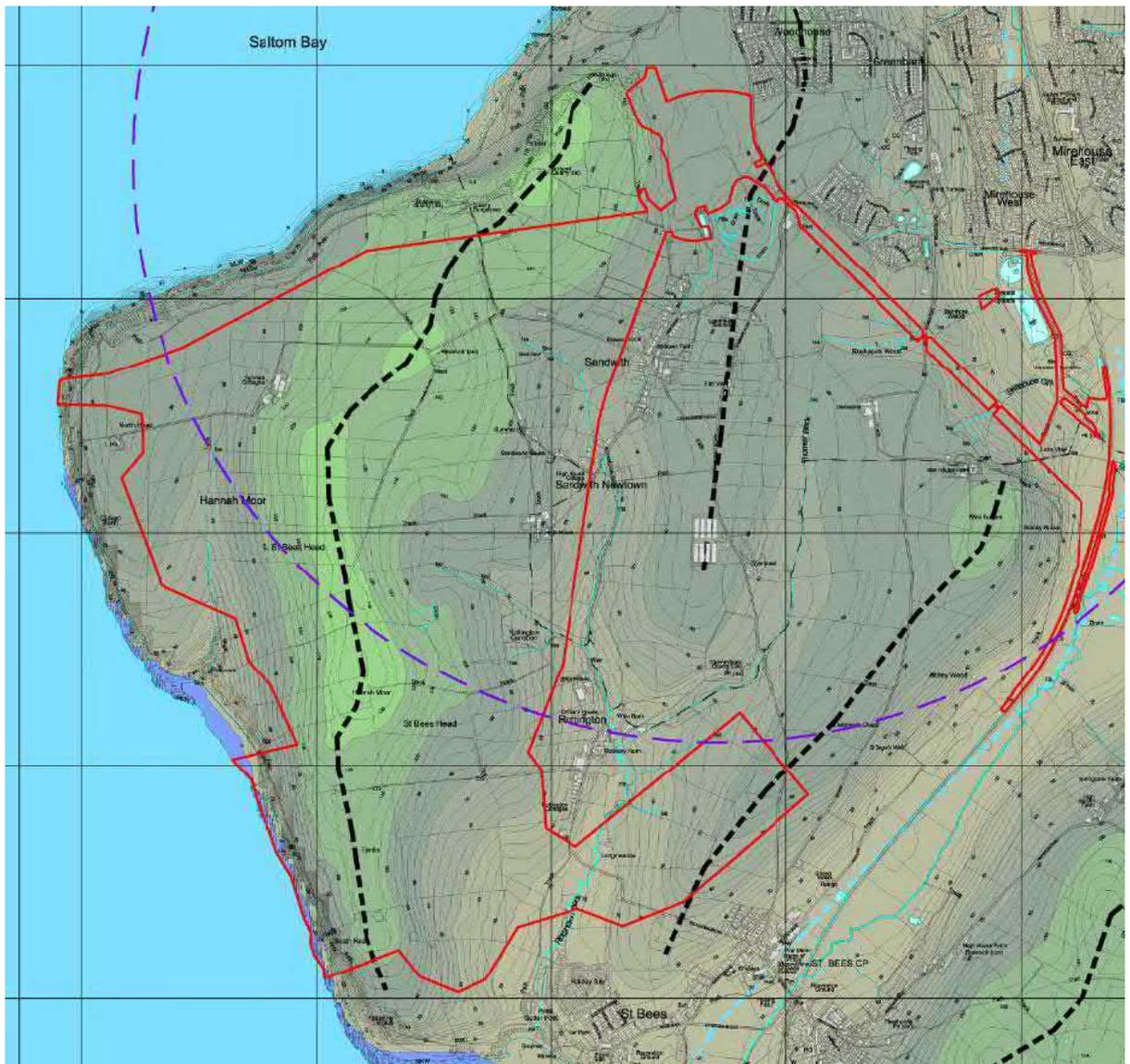


Figure 1: North/South Ridgeline across the Heritage Coast

Conflict with NPPF 174

- 2.14. As noted at paragraph 2.13 above, we are all in agreement that there would not be a significant effect on the Heritage Coast. Therefore, the project complies with NPPF 174 (a) in terms of protecting valued landscapes. The project has gone to great lengths as described in the Design and Access Statement to mitigate the visual effects of the project at the Marchon site, such as enclosing mining infrastructure in iconic domes, and providing mounding in key areas as well as planting. Whilst at the RLF site, mitigation measures included lowering the height of the building, considering the use of a range of materials for cladding the buildings and providing mitigation planting that met the strict requirements of the flooding agency and Network Rail. Therefore, I consider the project recognises the intrinsic character and beauty of the countryside and has made a considerable effort to comply with NPPF 174 (b). In terms of NPPF (c) and maintaining the character of the undeveloped coast, the RLF has no intervisibility with the coast as shown on the ZTV and the Marchon site has limited

intervisibility. In addition, the site cannot be described as undeveloped. Although the Heritage Coast sits within ALC 4ii: Sandstone Coastal Down, the designation does not abut the site. At para 4.38 of Mr Radmall's proof, he appears to suggest there is an indirect effect arising on the Heritage Coast due to effects arising at viewpoint 1. Viewpoint 1 is representative of views for visual receptors such as residential receptors along High Road. Effects on visual receptors should not be used to inflate the effects of the project on the Heritage Coast. The assessment should consider changes to the landscape as a resource in its own right as opposed to the effect on specific views and on the general amenity as defined in GLVIA3. I consider that the project complies with the relevant policies in the NPPF.

Views from the Coastal Path

- 2.15. In paragraph 4.43 of Mr Radmall's proof he suggests that the level of visual effect on the section of Coastal Path close to viewpoint 5 should be major/moderate and not minor as reported in the LVIA. It is worth noting that within the LVIA, it is the effect on users of the coastal path that has been assessed, and not specifically at VP 5. Cross reference to the updated photography at VP 5 and Site Photography B, within the appendix of my proof (Section A), indicates that there is rising ground in the foreground which effectively blocks views of the ground further south. It may be possible that the tops of the domes would be visible from this location. However, it is worth noting that VP5 is located at the very limit of visibility for the Marchon site and walking north and south of this location will result in a lessening of theoretical visibility. No other sections of the Coastal Path will have visibility of the Project according to the ZTV. I consider that for the vast majority of the Coastal Path there will be no significant effect arising and in proximity to VP 5 a minor effect is appropriate. The nature and purpose of a coastal walk is to enjoy the views of the coast, in other words looking out to sea. The appearance of the top of domes when looking landward are unlikely to give rise to major/moderate visual effects on users of the Coastal Path whose main point of focus is likely to be the coastline, and these views will be unaffected by the project.

SIGNED: *John Flannery*

DATE: 31 August 2021