



Article title: Use of evidence and expertise in UK climate governance: The case of the Cumbrian Coal Mine

Authors: Rebecca Willis[1]

Affiliations: lancaster university[1]

Orcid ids: 0000-0001-9551-7608[1]

Contact e-mail: r.willis@lancaster.ac.uk

License information: This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY) 4.0 <https://creativecommons.org/licenses/by/4.0/>, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Preprint statement: This article is a preprint and has not been peer-reviewed, under consideration and submitted to UCL Open: Environment Preprint for open peer review.

Funder(s):Funder(s):||Funder(s): UK Research and Innovation

DOI: 10.14324/111.444/000204.v1

Preprint first posted online: 03 May 2023

Keywords: climate, evidence, expertise, coal, steel, Climate Change Act, planning, Cumbria, UK, Politics of the environment, Environmental policy and practice, Public policymaking, Climate change, Climate modelling

Use of evidence and expertise in UK climate governance: The case of the Cumbrian Coal Mine

Rebecca Willis, Lancaster Environment Centre, Lancaster University

Abstract

There is a clear scientific consensus that no new coal mines can be developed, if the Paris Agreement to limit global temperature rises is to be met. Yet in December 2022, following a lengthy Public Inquiry, the UK Government approved the development of Woodhouse Colliery in Cumbria. In doing so, it accepted the claim that the coal mine would be ‘zero carbon’, and could even result in lower global emissions overall. As this paper demonstrates, there is no independent evidence to support these claims, whilst a large body of independent evidence comes to the opposite conclusion. This paper uses the example of Woodhouse Colliery to examine the use of evidence and expertise in climate governance processes. It finds that the nature of expertise and evidence is not properly considered, and that there is ambiguity and confusion surrounding the implementation of the UK’s climate legislation, particularly the Climate Change Act. It also finds that the ways in which the decision-making process solicited and assessed evidence was flawed, promoting a ‘false balance’. This ambiguity and false balance provide scope for developers to argue the case for destructive developments, even while claiming adherence to climate ambitions. The paper concludes by suggesting reforms to governance processes, to provide a more transparent and credible implementation of policies to achieve the UK’s net zero target. Suggested reforms include clearer rules governing fossil fuel phase-out; greater transparency and better handling of conflicts of interest in decision-making; and devolution of climate responsibilities to local areas.

Keywords: climate, evidence, expertise, coal, steel, Climate Change Act, planning, Cumbria, UK

1. Introduction

In 2022, eight years after it was first formally proposed, the UK government granted planning permission for Woodhouse Colliery, a proposed mine for metallurgical coal used in steelmaking. The route to approval (see table 1) had been tortuous, with the mine approved on three separate occasions by the local authority, Cumbria County Council; a lengthy Public Inquiry; the launch of four legal challenges against the mine; and a great deal of media and political controversy. Much of the controversy has centred around the climate impacts of burning coal, the most carbon-polluting of all fossil fuels, in the UK – a country with comprehensive climate legislation, statutory targets to reach net-zero greenhouse gas emissions (GHG) by 2050, and a strong commitment to the United Nations Framework Convention on Climate Change (UNFCCC) (HM Government, 2022).

2014-2017	West Cumbria Mining (WCM) develop plans and undertake consultation
May 2017	WCM submit application for detailed planning permission
March 2019	Cumbria County Council development control committee vote to approve the development
June 2019	UK Parliament legislates new target of net-zero GHG emissions for the UK; Legal challenge against WCM issued by Keep Cumbrian Coal in the Hole (KCCH)
October 2019	Cumbria County Council development control committee vote to approve the development

Nov 2109- Feb 2020	KCCH request a Judicial Review challenging the decision; this is granted
May 2020	KCCH withdraw their challenge as Cumbria County Council say they will reconsider the application
October 2020	Cumbria County Council development control committee vote to approve the development
December 2020	The Climate Change Committee (CCC) publish the Sixth Carbon Budget; Cumbria County Council say they will once again reconsider the proposal
March 2021	The Secretary of State 'calls in' the decision, ie states that it will be determined by the Government, following a Public Inquiry
September 2021	Public Inquiry takes place; two organisations play a formal role in opposing the mine: South Lakes Action on Climate Change (SLACC) and Friends of the Earth (FoE).
December 2022	Secretary of State issues planning permission for Woodhouse Colliery
January 2023	SLACC and FoE request a Judicial Review of the Secretary of State's decision
May 2023	The request for a Judicial Review is turned down

37

38 **table 1: timeline of decision-making for Woodhouse Colliery**

39

40 This paper reviews the decision-making process for Woodhouse Colliery, and assesses the
41 lessons for climate governance, in the UK and more widely. I begin, in Section 2, with a
42 summary of scientific evidence and international agreements on climate change,
43 greenhouse gas emissions and fossil fuel extraction. In Section 3, I review the UK's system
44 of climate governance, centred around the 2008 Climate Change Act. In section 4, I
45 summarise the arguments put forward by West Cumbria Mining, in making the case that the
46 mine would not adversely affect climate change; and state how these claims were
47 countered. In Section 5, I then analyse some common threads in the way that evidence was
48 presented and used in the Public Inquiry. Three tendencies are identified: first, imbalances in
49 the status of expertise, in that, whereas WCM relied on commercial consultants, opponents
50 of the mine were professionals with independent standing in academia or public life. Second,
51 the exploitation of the ambiguity contained within UK climate legislation; and third, the
52 tendency to 'false balance', giving equal weight to arguments for and against the mine,
53 rather than assessing the state of evidence. The combination of these tendencies, it is
54 argued, led to a decision in favour of the mine.

55 In Section 6, the case of Woodhouse Colliery is placed in a global context, and is shown to
56 be part of a wider pattern of delay and ambiguity in climate action, in part orchestrated by
57 powerful economic interests. In Section 7, the paper concludes with an assessment of
58 changes needed to legislation and approaches to climate change, in the UK and more
59 widely, if global climate goals are to be met.

60 As this paper is about the use of scientific and expert evidence in governance processes, it
61 is important for myself, as the author, to be transparent about my own position. My expertise
62 lies in the field of climate governance: the process by which societies and polities agree
63 rules and strategies to combat climate change. The decision-making process around
64 Woodhouse Colliery provides an example of this governance in action, and as such
65 highlights many areas that could be improved, and indeed must be improved if the UK is to
66 meet the targets it has enshrined in law.

67 I have also been involved in the case directly, in two ways. I have provided media comment
68 on the case, based on the analysis that I set out in this paper. I have also assisted
69 independent expert witnesses in providing evidence to the Public Inquiry, on areas including
70 the link to climate legislation; prospects for steel industry decarbonisation; and international
71 diplomacy issues. These experts have all spoken against the proposed development. This is
72 set out in Section 4 below. My involvement is based on my, and others', assessment of the
73 evidence. As an independent academic, my role is to assess evidence and give a clear
74 account of its implications, as well as offering clarity about where uncertainties exist, or
75 where there is limited evidence.

76 My media involvement, and my involvement in the Public Inquiry process, shows that I have
77 a clear, publicly-stated position against the mine. This is based on my assessment of the
78 evidence, which I set out in this paper. It is not my role to stay neutral unless such neutrality
79 is justified by the evidence. If evidence on climate science and governance were different,
80 and suggested that the mine could be justified, my account would reflect this. As I show in
81 Section 3, this is not the case.

82 I have chosen to publish this paper in a journal with an open peer-review process. This
83 allows anyone to scrutinise the evidence I use, and the position I take. I will actively seek
84 comment from opponents to the mine, and ask for evidence to substantiate their position. If
85 there are errors of fact or judgement in the case I set out, I pledge to correct them
86 transparently. I hope that this paper, and the peer-review process, will spark a useful debate
87 about the role of evidence in climate governance.

88 **2. The scientific consensus on climate change and fossil fuel extraction**

89 The 2015 Paris Agreement on Climate Change, signed by 196 countries including the UK,
90 commits to stabilising the global climate to “to well below 2°C above pre-industrial levels and
91 pursuing efforts to limit the temperature increase to 1.5°C” (United Nations, 2015), in order
92 to limit dangerous climate change. The 2021 Glasgow Pact reaffirms this goal and develops
93 more detailed plans for its achievement.

94 The implications of this global agreement for fossil fuel extraction are clear. The
95 Intergovernmental Panel on Climate Change (IPPC) states that there is a linear relationship
96 between GHG emissions and temperature rise, leading them to estimate in 2020 that only a
97 further 500 gigatonnes of carbon dioxide (GtCO₂) could be emitted, to have a 50% chance of
98 limiting warming to 1.5°C (Intergovernmental Panel on Climate Change, 2021). This is the
99 remaining ‘carbon budget’ that can be emitted if we are to have a fair chance of stabilising
100 global emissions. The total amount of emissions from developed reserves of oil, gas and
101 coal, defined as “the cumulative quantity of oil, gas and coal that companies have already
102 discovered and for which a financial and regulatory commitment to extraction has been
103 made”, is estimated at 936 Gt CO₂, almost double the remaining carbon budget for 1.5°C.
104 Coal accounts for nearly half of this, at 446 Gt CO₂ (Trout *et al.*, 2022). Thus, if the fossil
105 fuels from developed reserves were extracted and burned, this would take us well over the
106 global carbon budget. Existing developed reserves will need to remain unused if we are to
107 keep to global temperature goals. Removing carbon dioxide from the atmosphere cannot
108 happen at a scale significant enough to change this basic predicament (Anderson and
109 Peters, 2016). The International Energy Agency estimates that only 0.004Gt CO₂ is currently
110 removed, predicted to rise to 1.6Gt CO₂ by 2030 and 7.6Gt CO₂ a year by 2050
111 (International Energy Agency, 2021).

112
113 Any new sites of fossil fuel extraction would only add to this problem. A range of studies
114 have concluded, therefore, that new fossil fuel extraction sites are incompatible with the
115 Paris Agreement. This includes reports by the United National Environment Programme

116 (United Nations, 2022a); the International Energy Agency (International Energy Agency,
117 2021); and many academic studies (McGlade and Ekins, 2015; Welsby *et al.*, 2021). In
118 summary, these reports and research show that no new extraction facilities such as oil or
119 gas wells, or coal mines, can open, if we are to stay within the globally agreed carbon
120 budget; and existing sites will have to reduce their production. This is a matter of arithmetic,
121 not opinion. In the words of UN Secretary General Antonio Guterres, “climate activists are
122 sometimes depicted as dangerous radicals. But the truly dangerous radicals are the
123 countries that are increasing production of dangerous fossil fuels. Investing in new fossil fuel
124 infrastructure is moral and economic madness” (United Nations, 2022).

125 126 **3. UK climate governance: the state of play**

127 The UK was the first country to set statutory (legally binding) targets to guide GHG reduction
128 at a national level. The Climate Change Act (CCA), passed in 2008, initially set a target of
129 80% GHG reduction in GHGs, by 2050, from a 1990 baseline. Under the Act, Parliament
130 must agree five-yearly ‘carbon budgets’, essentially interim targets to ensure progress
131 toward the 2050 target. In setting carbon budgets and developing strategies to meet them,
132 Government and Parliament are advised by the independent advisers, the Climate Change
133 Committee, also established under the 2008 Act. In 2019, the Act was amended, setting a
134 more stringent goal of ‘net zero’ GHG emissions by 2050, with ‘net zero’ meaning that any
135 emissions of GHGs must be matched by equivalent levels of GHG removals, through
136 changes to land use such as increased tree planting, and through mechanical removal, such
137 as carbon capture and storage (CCS).

138 While the CCA is a comprehensive piece of legislation, setting economy-wide targets, it has
139 a number of significant weaknesses and ambiguities. These include: 1) a lack of clarity over
140 the contribution of different sectors of the economy to GHG reduction; 2) statutory targets
141 are set at national level only, with ambiguity over the expected contribution of local or
142 devolved administrations; 3) in terms of GHG accounting, the targets relate to GHG
143 emissions from within UK territorial borders, not emissions in other jurisdictions which could
144 reasonably be seen to be resulting from UK-based activities; and 4) there is no clarity over
145 the role or extent of GHG removals in achieving the 2050 target. These weaknesses and
146 ambiguities, which are detailed below, are all illustrated in the example of Woodhouse
147 Colliery, as discussed in Sections 4 and 5 below.

148 **3.1 Contribution of different sectors of the economy to GHG reduction**

149 The targets for emissions reduction in the CCA are economy are not broken down by sector
150 of the economy, or by government department. One department, currently the Department
151 for Energy Security and Net Zero, has overall responsibility for leading the UK’s climate
152 strategy and meeting the targets. Achieving these targets requires action by other
153 departments as well, yet there is no set process for managing decarbonisation across
154 different departments and sectors (Willis *et al.*, 2019). The Climate Change Committee does
155 assess evidence and provide advice on the role of different sectors of the economy, in effect
156 offering targets for different sectors. For example, the sector pathway for steel implies that
157 by 2039, unabated coal (burning coal without capturing carbon) must end, as described by
158 Professor John Barrett in his evidence to the Public Inquiry (Climate Change Committee,
159 2021; also see Section 4 below). However, these sector pathways are merely advisory. The
160 Climate Change Committee has identified the lack of clarity and responsibility, a ‘governance
161 gap’, as a major risk to delivery of the UK’s net zero target. They state that there is a lack of
162 clear roles and responsibilities for other departments, and for regulators, devolved and local
163 government (Climate Change Committee, 2021).

164 This ‘governance gap’ means that the contribution of different sectors of the economy to
165 GHG reduction is not clearly delineated. The Climate Change Committee recently judged
166 that there are credible plans in place for only 39% of the emissions reductions needed to
167 meet the sixth Carbon Budget, with significant gaps or uncertainties in crucial areas
168 including transport, industrial decarbonisation, and land use (Climate Change Committee,
169 2021). This uncertainty directly affects the decision over Woodhouse Colliery, because it is
170 not clear who should take responsibility for the GHG emissions from planning decisions
171 (overseen by the Department for Levelling Up, Housing and Communities) or from the coal
172 or steel industry (overseen by the Department for Business and Trade).

173 **3.2 The role of the planning system in relation to climate targets**

174 Developments in England are governed by the National Planning Policy Framework (NPPF)
175 (Ministry of Housing Communities & Local Government, 2012). The NPPF sets out what the
176 Government’s planning policies are, and how they should be applied. This provides a
177 framework within which local areas develop their own, locally-specific plans. In the case of
178 Woodhouse Colliery, the relevant local plan was the Cumbria Minerals and Waste Local
179 Plan. The NPPF states that “the planning system should support the transition to a low
180 carbon future” (Ministry of Housing Communities & Local Government, 2012, p45). However,
181 there are ambiguities about how this ambition should be realised, and in particular, about
182 whether ‘end use’ emissions (i.e. in this case, emissions from burning the coal mined in
183 Cumbria) should be considered as part of the planning process. As a result, this issue has
184 been argued through numerous legal cases, including over Woodhouse Colliery.

185 The NPPF also contains a presumption against coal extraction, stating that planning
186 permission should not be granted for the extraction of coal, unless the proposal is
187 “environmentally acceptable”, or if it provides “benefits which clearly outweigh its likely
188 impacts” (Ministry of Housing Communities & Local Government, 2012, paragraph 217,
189 p62). However, the NPPF does not state how “environmentally acceptable” should be
190 defined or tested, or how to weigh up the benefits against likely impacts. As a result, again,
191 these questions have been argued through numerous legal cases.

192 The decision on Woodhouse Colliery was taken through the planning system, ultimately
193 through a Public Inquiry led by a Planning Inspector. The Inspector’s task was to rule on
194 whether the proposal was compatible with England’s planning laws. The wider question, of
195 whether the proposal is compatible with UK climate legislation or international climate
196 agreements, was not considered directly, but only indirectly, i.e. the extent to which planning
197 policy reflects and implements climate legislation and agreements.

198 Overall, there is no clarity on the link between planning policy and UK climate legislation,
199 and the resulting ambiguity is deeply problematic, as examined in Section 4 below.

200 **3.3 Local contributions to GHG reduction**

201 UK local government currently has no specific statutory responsibility for GHG reduction.
202 Responsibility for meeting the statutory net zero target (and interim carbon budgets) of the
203 Climate Change Act lies with the national parliament and government, as well as the
204 devolved nations (Scotland, Wales & Northern Ireland). Implicitly, it is clear from the Act that
205 all local authorities – indeed, all branches of government – must play their part in meeting
206 the overall target, but there are no clear roles, responsibilities or targets assigned to local
207 authorities. Nevertheless, many local areas have set their own targets and plans. For
208 example, Manchester has a target “to become a zero carbon city” by 2038 (Manchester City
209 Council, 2023); London by 2030 (Greater London Authority, 2023); and Cumbria by 2037
210 (note that in April 2023, following local government reorganisation, Cumbria County Council

211 was split into two different authorities: Cumberland Council, and Westmorland and Furness
212 Council) (Cumbria Action for Sustainability, 2023). These local targets are not enshrined in
213 law, and local authorities all measure and manage their climate impacts in different ways.
214 This contributes to the overall complexity of achieving the UK's climate goals. For example, it
215 is unclear whether or how Cumbria's target of net-zero emissions by 2037 was taken into
216 consideration in the planning decision for Woodhouse Colliery.

217 **3.4 Accounting for GHG emissions**

218 In line with international conventions in GHG accounting, the statutory targets enshrined in
219 the CCA relate to so-called 'production' emissions. GHGs are counted where the gases are
220 actually produced, and enter the atmosphere – these are 'production' emissions. It is also
221 possible to account for GHGs at the point of consumption of goods. For example, the GHG
222 emissions associated with manufacturing a laptop in China, but sold in the UK, are
223 conventionally ascribed to China, as the place of manufacture. Yet to the extent that demand
224 for such goods is driven by consumption patterns in the UK, the UK could be said to hold
225 some responsibility for these emissions. The UK does acknowledge this, in that it publishes
226 accounts of consumption-based emissions (Department for Environment, Food and Rural
227 Affairs, 2022), but the Climate Change Act accounts for production emissions only. Another
228 way in which GHGs could be measured is through so-called 'extraction' emissions: the point
229 at which fossil fuels are extracted from the ground. Under international conventions,
230 countries that extract coal, oil and gas for export do not account for the emissions that arise
231 when the fuels are burned in a different country.

232 For example, the emissions resulting from steel used in construction could be accounted for
233 in at least three different places, and quite possibly in three different countries: the mine
234 where the coal was extracted for steelmaking (extraction emissions); the steelworks that
235 burned the coal to make steel (production emissions); or the building site where the steel is
236 used in construction (consumption emissions). Under UNFCCC guidelines, only the
237 production emissions from the steelworks count toward a country's GHG inventory (Barrett
238 *et al.*, 2013).

239 As with all accounting, conventions are necessary, to avoid double- or triple-counting of
240 emissions. However, there is a danger that this hinders potential routes to GHG reduction. If
241 extraction emissions were considered, and discouraged – through a carbon price, for
242 example – this could influence steel manufacturers to look at alternatives such as hydrogen-
243 based production methods. If consumption emissions were considered, this could influence
244 the construction industry to source recycled steel, or use less steel.

245 An over-reliance on production-based emissions accounting therefore risks discounting a
246 number of feasible GHG reduction routes. It places an artificial boundary around an activity,
247 such as coal mining, or the import of consumer goods, meaning that emissions from those
248 activities can be ignored, even if there are steps that could have been taken to reduce
249 emissions. In an acknowledgement of this, some countries and local areas have instigated
250 particular policies and laws focussed directly on limiting extraction of fossil fuels, including
251 France, US states, and Wales (Erickson, Lazarus and Piggot, 2018).

252 **3.5 The role of greenhouse gas removals**

253 The emergence of the concept of 'net zero' emissions has put the spotlight on the 'net' in net
254 zero – in other words, the use of GHG removal technologies to compensate for GHG
255 emissions. GHG removal options involve capturing and storing GHGs, either using 'natural'
256 processes such as land-use changes – tree planting and soil management, for example – or
257 'engineered' processes, such as capturing and storing carbon dioxide from industrial

258 processes. Nearly all scenarios outlining credible paths to net zero, including those
259 developed by the International Energy Agency, the Intergovernmental Panel on Climate
260 Change, and the UK's Climate Change Committee, include a certain level of GHG removal
261 Agency (Committee, 2021; International Energy Agency, 2021; Intergovernmental Panel on
262 Climate Change, 2023).

263 There is a strong consensus that the total technical and economic potential for GHG removal
264 is limited, and therefore it cannot be a substitute for GHG reduction. For the UK, the Climate
265 Change Committee's advice is that GHG removal should be used to compensate for so-
266 called 'residual emissions' that are very difficult to eliminate, particularly from land use,
267 agriculture and aviation (Climate Change Committee, 2021; see also Anderson and Peters,
268 2016).

269 Thus the role played by GHG removals is limited, and should be seen as an addition to,
270 rather than an alternative to, reductions in GHG emissions. However, the very conception of
271 'net zero' subsumes GHG removals and reductions in GHG emissions into one single metric,
272 with the sense that one can be traded off against another (McLaren *et al.*, 2019). This is the
273 logic behind so-called 'offsetting' schemes offered to individuals and companies to
274 'compensate' for GHG emissions from aviation or buying vehicle fuel, for example. There is
275 evidence that this approach to GHG removal actually hinders or discourages reductions in
276 GHG emissions (Markusson *et al.*, 2022). There is a strong case for separating out targets
277 for GHG removals from reductions in GHG emissions to ensure that GHG removals are
278 additional, not an alternative approach (McLaren *et al.*, 2019). In the UK, this could be done
279 through specifying targets for each, as part of the CCA budget-setting process. However, at
280 present, there is no such clarity.

281 **4. Woodhouse colliery: Climate claims and counter-claims**

282 It is clear from basic scientific evidence (see section 2) that any new fossil fuel developments
283 breach the Paris Agreement, to which the UK is a signatory. Yet the UK government
284 approved Woodhouse Colliery. How can this have happened? This section surveys the main
285 claims, and evidence, put before the Public Inquiry into the coal mine, held in September
286 2021.

287 The Public Inquiry is explicitly tied to the planning system. The role of the Planning
288 Inspector, who conducted the Inquiry, was to judge whether the development was
289 compatible with planning legislation. Thus it would not be enough to say, as demonstrated in
290 Section 2 above, that the mine is incompatible with the UK's climate commitments. Instead,
291 the case must be made with reference to the complex relationship between planning law and
292 climate commitments.

293 In presenting its case, West Cumbria Mining (WCM) never stated opposition to the Climate
294 Change Act, or the Paris Agreement. Instead, it made the case that the development was
295 compatible with the UK's responsibilities on climate (West Cumbria Mining, 2022). This can
296 be seen as an argument in three stages. First, they sought to show that the proposed
297 development was permissible within planning law and guidance, as set out in the NPPF (see
298 Section 3.2 above). Second, they implied that, because it was (as they claimed) permissible
299 within planning law, it logically must be compatible with UK climate legislation more
300 generally, including the Climate Change Act. Third, they claimed that because it was
301 permissible within planning law, and that this implied it must be compatible with UK climate
302 legislation, it must therefore follow that it has a neutral, or even positive, effect on climate
303 change.

304 This argument would make sense if there were specified, transparent and undisputed links
305 between planning legislation, climate legislation and overall climate impacts – in other words,
306 if the ambiguities in legislation were minimal. However, as described in Section 3 above, this
307 is not the case. The links between the Climate Change Act and the NPPF are disputed;
308 there are also ambiguities about how GHG emissions should be accounted for.

309 Despite this situation, WCM's arguments were largely accepted by the Secretary of State,
310 Michael Gove, who stated in his decision letter approving the mine that the proposed
311 development “would to some extent support the transition to a low carbon future” and “would
312 have an overall neutral effect on climate change and is thus consistent with Government
313 policies for meeting the challenge of climate change” (decision letter p6 para 38).

314 For this conclusion to be correct, all of the following claims put forward by the mine must be
315 correct:

- 316 • WCM can only be held responsible for emissions from the mine site, not from
317 emissions from burning coal;
- 318 • The mine will result in reduced transportation of coal, and lower greenhouse gas
319 emissions due to more efficient facilities;
- 320 • Coal will still be needed to make steel, and coal burning will be offset either through
321 offsetting schemes or through emissions reductions elsewhere in the economy;
- 322 • Offset schemes can be used to compensate for any residual emissions;
- 323 • Coal from Cumbria will substitute for coal mined elsewhere, with other mines
324 reducing production in line with increases from the new mine;
- 325 • Consenting a coal mine will have no effect on international diplomacy or other
326 countries' commitment to climate action.

327 These claims, and the responses to them from those opposing the scheme, are described
328 below. Each was the subject of lengthy documentation, and considerable debate during the
329 Public Inquiry. As I discuss in Section 5, if UK climate legislation were clearer, these
330 complex claims and counter-claims would not have needed to be played out in the Inquiry.
331 For instance, the role of GHG removals (see 3.5 above) would not need to be discussed at
332 length if the principles were set out explicitly in climate legislation. The lack of clarity created
333 what I describe (Section 5.3) as ‘false balance’ in which complex arguments for and against
334 the mine, and claims about compatibility with ambiguous legislation, distracted from the
335 fundamental point that further coal extraction is incompatible with the Paris Agreement.

336 In describing the claims and counter-claims set out in the Public Inquiry, my aim is not to set
337 out the issues in full, but to present an indication of the issues that were considered as part
338 of the decision-making process. I only examine arguments relating to climate issues in this
339 paper. The Public Inquiry also covered other issues, such as the future of the steel industry;
340 employment considerations; other environmental issues; and other land use planning
341 matters. These issues are undoubtedly important. However, if the mine contravenes the
342 UK's climate commitments, in the form of the Climate Change Act and the Paris Agreement,
343 then logically it cannot go ahead. A breach of law cannot be justified through an appeal to
344 other benefits.

345 **4.1 Only emissions from the mine site should be considered:** In its Statement of Case,
346 WCM states that “it is not appropriate to have regard to GHG emissions caused by the end
347 use of the coal extracted from the proposed development at other facilities.” (West Cumbria
348 Mining, 2022, p40). In other words, WCM should not be responsible for the emissions
349 caused by burning the coal, and should only have responsibility for the emissions from the
350 mine site itself. As discussed (Section 3.3) this claim is based on the convention that GHGs

351 are counted where they are emitted into the atmosphere, i.e. where the coal is burned, not
352 where it is extracted.

353 Respondents, including Professors Michael Grubb and John Barrett, disputed this, stating
354 that these end-use emissions were a material consideration, given the need to take account
355 of UK climate legislation in planning policy.

356 **4.2 Fewer imports; efficient facilities:** Second, WCM's statement of case says that "the
357 proposed development will help support the transition to a low carbon future [...] by
358 removing reliance upon imported coking coal with a higher carbon footprint" (West Cumbria
359 Mining, 2022, p40). Specifically, it states that the development will "reduce transportation
360 emissions" and "provide the opportunity to create a state-of-the-art mining facility with lower
361 GHG emissions than other existing mining operations" (West Cumbria Mining, 2022, p41).

362 These claims were disputed by respondents, including Professor Michael Grubb, Professor
363 John Barrett, and Professor Paul Ekins. They stated that the emissions from the mine site,
364 and from coal transportation, were a tiny fraction of the emissions from burning the coal.
365 There was also conflicting evidence about whether the coal would be used within the UK
366 (thereby reducing imports) or whether it would be shipped elsewhere. Aspects of the mine's
367 own operations were critiqued, particularly the issue of methane emissions from the mine
368 site.

369 **4.3 Coal will still be needed to make steel, with CCS:** Third, WCM states that "coking coal
370 is likely to continue to form part of a net zero compliant option for steel production" (p41 para
371 109). This was disputed by Professor Lars Nilsson, Professor Paul Ekins and Professor
372 Stuart Haszeldine, who stated that steel companies were increasingly using hydrogen-based
373 steelmaking, which did not require coal; and that more steel could be recycled using electric
374 arc furnaces.

375 **4.4 Use of offsetting:** WCM states that "where it is not possible to remove operational GHG
376 emissions entirely, WCM will commit to ensuring that these residual emissions are offset"
377 (West Cumbria Mining, 2022, p41). As described in Section 3.5 above, the use of GHG
378 removals to 'offset' GHG emissions that could be otherwise reduced or avoided, is not in line
379 with climate science. WCM stated that it would use Gold Standard certified credits; however
380 the Gold Standard Foundation, which oversees the use of these credits, provided a letter to
381 the Public Inquiry stating that it is "strongly against the further extraction of fossil fuels" and
382 that new coal mines are to be avoided (Kirby, 2021).

383 **4.5 Coal will substitute for coal mined elsewhere:** The WCM statement of case states
384 that, though the end-use emissions (ie from burning the coal) should not be taken into
385 account, even if they are taken into account, "there is a strong economic case for
386 substitution", i.e. that Cumbrian coal would substitute for coal mined elsewhere. In other
387 words, every tonne of coal extracted in Cumbria would result in a tonne of coal **not** being
388 extracted elsewhere, thus not increasing the total amount of coal burned or GHGs emitted.
389 WCM's argument was supplemented by a report from consultants Ecolyse.

390 Professor Michael Grubb and other respondents disputed this case. Professor Grubb stated
391 that it was highly unlikely that the opening of the Cumbria mine would result in reduced
392 production in other mines, thus disputing the 'substitution' argument. He calculated that even
393 if just 1% of the coal mined in Cumbria was additional, this would more than double the total
394 emissions of the mine as estimated in the Ecolyse report. Similar arguments were put
395 forward by Professor Paul Ekins, who presented peer-reviewed research on the price
396 elasticity of coal, stating that WCM coal would decrease prices for metallurgical coal and
397 therefore increase demand.

398 **4.6 Impact on international diplomacy:** The WCM Statement of Case makes no mention
 399 of an argument used by opponents of the mine, that the UK’s permitting of the mine would
 400 send unhelpful political and diplomatic signals, making other countries less ambitious on
 401 climate. This argument was put forward by opponents to the mine, including Professor
 402 Grubb; Professor Sir Robert Watson; Lord Deben, chair of the Climate Change Committee;
 403 and John Ashton, former UK Government Special Representative for Climate Change.

404 **5 How evidence was presented and used in the Public Inquiry**

405 In this section, I draw out some patterns in the way that evidence was presented and used in
 406 the Public Inquiry, namely the status of expertise; the exploitation of ambiguity; and the
 407 creation of ‘false balance’.

408 **5.1 The status of expertise**

409 As can be seen from table 2, there was a notable imbalance in expertise on climate issues at
 410 the Public Inquiry. WCM relied on commercial consultants that they themselves had
 411 commissioned, including reports by consultancies Ecolyse and AECOM, and appearances in
 412 front of the Inquiry by Ms Caroline Leatherdale, a consultant focussing on environmental
 413 impact assessments; and Mr William Tonks, a mining ventilation specialist. By comparison,
 414 many of those expressing opposition to the mine had climate specialisms – these included
 415 Prof Michael Grubb, Prof Paul Ekins, Prof Sir Robert Watson, Professor John Barrett, John
 416 Ashton CBE and Lord Deben (see table 2 for affiliations) and spoke in an independent
 417 capacity, not as paid consultants, using evidence from peer-reviewed or independent
 418 sources.

419 An assessment of both written and verbal evidence heard during the Public Inquiry thus
 420 suggests that the weight of evidence strongly supported the position that the climate impacts
 421 of the mine are negative and indeed contrary to the UK’s climate objectives. This ‘weight of
 422 evidence’ can be judged by levels of expertise of witnesses; quality of evidence as judged by
 423 use of peer-reviewed data, for example; and independence, i.e. professionals with
 424 independent standing in academia or public service, who had not been commissioned or
 425 paid as consultants to give evidence.

426 This is not to question the expertise or integrity of the consultants employed by WCM. I am
 427 not claiming that the consultants purposefully misled the Inspector, but that, by the nature of
 428 their commission, they provided specific, limited answers to the specific, limited questions
 429 they were given. Preparing a consultancy report in response to a specific brief is a different
 430 process to preparing an independent statement based on peer-reviewed evidence.

431

Witnesses appearing for West Cumbria Mining	Witnesses appearing for South Lakes Action on Climate Change and Friends of the Earth UK
<ul style="list-style-type: none"> • Ms Caroline Leatherdale, environmental adviser employed by West Cumbria Mining • Mr William Tonks, specialist in mine ventilation, director of Bill Tonks Ventilation Services Ltd 	<ul style="list-style-type: none"> • Professor Sir Robert Watson, former Chair of the Intergovernmental Panel on Climate Change, former Chief Scientific Adviser to the Department for Environment, Food & Rural Affairs, former Chief Scientific Adviser to the World Bank, former Associate Director for Environment in the Clinton White House

	<ul style="list-style-type: none"> • Professor Paul Ekins, professor of resources and environmental policy at the UCL Institute for Sustainable Resources, former adviser to the UK Parliament and the Climate Change Committee • Professor Michael Grubb, professor of Energy & Climate Change at UCL, former member of the Climate Change Committee, former adviser to the UK Office of Gas and Electricity Markets • Professor John Barrett, Professor of Energy & Climate Policy, University of Leeds; adviser to the UK Department for Business, Energy & Industrial Strategy; lead author for the Intergovernmental Panel on Climate Change working group III ‘mitigation of climate change’
--	---

432

433 **table 2: Witnesses on the issue of climate change called before the Public Inquiry**

434 **5.2 Exploiting legislative ambiguity**

435 As set out in Section 3 above, there are clear limitations and ambiguities contained within
 436 UK climate legislation, as well as within the planning system. developments to claim that
 437 their projects are allowable under the legislation. With reference to each of the weaknesses
 438 and ambiguities described in Section 3:

- 439 • Ambiguities surrounding **the contribution of different sectors of the economy** (3.1
 440 above) provides room for West Cumbria Mining to claim that the emissions from their
 441 development should be allowed, with the required national GHG reductions coming
 442 from unspecified actions elsewhere.
- 443 • The ambiguities in **the planning system** (3.2 above) and specifically the National
 444 Planning Policy Framework, create confusion about whether the full climate impacts
 445 of any given development should be considered in a specific planning decision.
- 446 • Since there is no clear legislation or policy on **local contributions to GHG**
 447 **reduction** (3.3 above), Cumbria County Council is not required to account for the
 448 emissions from the mine in its own climate strategy.
- 449 • In terms of **accounting for GHG emissions** (3.4 above), the lack of targets or policy
 450 covering extraction of fossil fuels allows West Cumbria Mining to claim that they
 451 should only shoulder responsibility from the mine site itself, not from the end use of
 452 the coal.
- 453 • In terms of **greenhouse gas removals** (3.5 above), the lack of clarity on the
 454 contribution of removals to the overall target allows West Cumbria Mining to make
 455 the claim that its emissions can be ‘offset’ through removals.

456 These arguments can be seen throughout WCM’s documents and argumentation in the
 457 Public Inquiry. In summary, WCM say that “the overall responsibility for the economy-wide
 458 transition to a low carbon society and the policies that are required to support that transition
 459 is the responsibility of the UK Government”, and that “these matters must be considered
 460 holistically, rather than on a case-by-case basis, through the determination of planning

461 applications” (West Cumbria Mining, 2022, p29). Where there is so much ambiguity and
462 complexity, it becomes possible to claim that one specific development cannot be held to
463 account.

464 **5.3 False balance**

465 In making its central claim that the climate impact of Woodhouse Colliery is neutral, WCM’s
466 strategy can be seen as promoting so-called ‘false balance’. False balance can be defined
467 as “presenting two sides of a debate as more equal than is justified by the evidence”
468 (Rietdijk and Archer, 2021,p64). False balance has been much discussed in regard to media
469 coverage of climate science, when media outlets give equal airtime to scientists supporting
470 and opposing the scientific consensus on climate change, despite the presence of an
471 overwhelming consensus overall (Koehler, 2016; Fahy, 2017). Thus, in a debate about
472 climate impacts, a climate scientist representing the consensus position is paired with
473 someone who does not accept this consensus, even though this position is at odds with the
474 weight of scientific evidence. False balance sometimes comes about because media
475 producers believe that it is important to represent ‘both sides’ of a debate; it may also come
476 about because of a particular agenda that the media outlet is pursuing.

477 The use of false balance in the legal case over Woodhouse Colliery is similar. In the case,
478 mine supporters made claims about the supposedly ‘positive’ climate impacts, opening up a
479 debate between two opposing views, even when this debate is not justified by the weight or
480 quality of evidence. Instances of false balance include, first, the statement that offset
481 schemes can be used to ‘compensate’ for any residual emissions, when there is a clear
482 scientific consensus that this is an inappropriate use of GHG removals (see sections 2, 3.5
483 and 4.4 above). Second, the statement that the mine would result in GHG savings because
484 of reduced transport costs, and because coal from Cumbria will substitute for coal mined
485 elsewhere, was not substantiated by evidence (see section 4.2 above). Lastly, the idea
486 promoted by WCM that the coal mine would be a ‘zero carbon coal mine’ is not supported by
487 convincing evidence, and relies on offsetting which, as described above, is discredited.

488 These statements, even if badly served by underlying evidence, must be considered and
489 debated. Each must be examined and rebutted. In the media coverage on the coal mine,
490 these claims were, indeed, discussed at length. Debates often involved two contributors,
491 one speaking in favour of the mine, and one against.

492 Added together, this contributes to an overall false balance - the assertion that there is a
493 debate to be had about whether a new coal mine can be opened. Thus the simple fact set
494 out in Section 2, that any new coal mine is not compatible with the Paris Agreement to limit
495 global warming, is replaced by a complex series of claims which, even if not supported by
496 the evidence, serve to provide the impression that there are two, evenly-balanced ‘sides’ to
497 the debate.

498 **6. Doubt and delay: strategies to question and limit climate action**

499 In Section 4, I set out the way in which WCM could put forward their argument that this mine
500 has an overall positive effect on climate change, despite overwhelming evidence to the
501 contrary. We now place this case in a wider context of the strategies employed by high-
502 carbon economic interests, to make a case for continued exploitation of fossil fuels.

503 There is a well-documented history of companies involved in fossil fuel extraction opposing
504 the scientific consensus on climate change, through funding and cultivating links with think-
505 tanks, policy institutes and commentators who oppose the consensus (Oreskes & Conway
506 2011). The strategy, for many years, was to raise questions and promote debate about the

507 science, thereby obscuring the clear scientific consensus on anthropogenic global warming.
508 These tactics had been learned from the tobacco industry, who had, for many years, sought
509 to promote doubt about the links between smoking and serious harms to health.

510 The strategy worked. The Intergovernmental Panel on Climate Change published its first
511 report documenting the scientific consensus on climate change in 1990. It took nearly thirty
512 years for the BBC to tell its editors that it was not necessary to include outright deniers of
513 climate science in order to achieve 'balance' (Hickman, 2018). In the intervening decades,
514 the 'false balance' arguments about whether climate change was happening or not,
515 squeezed out the very necessary debates of how to respond to climate change and reduce
516 GHG emissions.

517 More recently, the science of climate change has largely been accepted, even by companies
518 involved in fossil fuel extraction (it is, however, worth noting that doubt about climate science
519 still has a strong foothold in media and politics, particularly in the US, where many
520 Republican politicians openly express doubts (Dunlap, McCright and Yarosh, 2016). Tactics
521 have shifted from denying the science outright, to opening up a range of often spurious
522 debates about what the responses should be. This new approach has been dubbed
523 'Discourses of Delay' (Lamb *et al.*, 2020). Such discourses include shifting responsibility for
524 action - 'emissions reductions can come from elsewhere'; comparisons – 'our carbon
525 footprint is trivial compared to others'; technological optimism, including a faith in GHG
526 removals; and 'fossil fuel solutionism' in which fossil fuels are seen as a bridge to a zero
527 carbon future. It is important to note that these arguments are not always entirely wrong, or
528 used intentionally to slow climate action. As Lamb *et al* make clear, "discourses of delay
529 often contain partial truths and may be put forward in good faith" (Lamb *et al.*, 2020 p2-3).
530 However, "in the absence of high-quality public deliberation, and in the hands of interest
531 groups fighting against regulation, our concern is that discourses of delay will disorientate
532 and discourage ambitious climate action" (Lamb *et al.*, 2020 p3).

533 This is exactly the approach taken by West Cumbria Mining, and the mine's supporters more
534 generally. WCM did not question the science of climate change, nor the UK's specific net
535 zero target, the Climate Change Act, or its international obligations under the Paris
536 Agreement. Instead, their approach was to say that they agreed with the need for climate
537 action, but that their own project was legal, and would not have a negative effect. A whole
538 set of complex arguments (summarised in section 4) were deployed, introducing complexity
539 and confusion. When combined with the ambiguities of UK climate legislation (section 3),
540 this meant that the mine's opponents had to engage in detailed debate about each of these
541 arguments – a much more difficult and complex job than simply stating that the mine is
542 incompatible with the Paris Agreement (section 2). Overall, as set out in 5.3 above, this
543 contributes to a false balance – the idea that there is a debate to be had over whether a new
544 coal mine should go ahead.

545 Having been closely involved in the mine debate over several years, I saw this pattern of
546 complexity, doubt, delay and false balance – enabled by the ambiguities and inconsistencies
547 of UK climate legislation – play out many times over, in the protracted legal process and in
548 media debates. When asked for media comment on the mine, I tried to put forward two
549 points: first, that the mine was incompatible with the Paris Agreement; and, second,
550 highlighting the tactics of doubt and delay used by mine supporters. However, the questions
551 I was asked were never about these general points, but about the detail of specific issues –
552 complexity instead of simplicity.

553 **6. Conclusion**

554 This paper set out to answer the question of how a coal mine could be consented in a
555 country with world-leading climate legislation, in the face of clear evidence that the opening
556 of further fossil fuel extraction sites is not compatible with the Paris Agreement, and at a time
557 of rapidly worsening climate impacts. It found that the case for the mine was made through
558 exploiting ambiguities in the UK's climate legislation, in particular the unclear links between
559 planning policy and the Climate Change Act; and through the introduction of complex, under-
560 evidenced arguments which combined to create a false balance – the impression that there
561 is a debate to be had about whether or not the mine contravenes climate ambitions.

562 As argued in section 5, the case of Woodhouse Colliery is an example of a wider tendency
563 to foster complexity, doubt and delay in climate decision-making. As such, it should not be
564 seen as a one-off aberration, but an indication of a deeper problem. Similar arguments are
565 being played out in other domains. These include arguments for opening new oil and gas
566 extraction sites in the North Sea, which are claimed to be 'net zero' in operation, and
567 required to 'fuel the transition' (see for example Offshore Energy UK, 2022); airport
568 expansion, in which airlines and airports claim that aviation demand should not be restricted,
569 because emissions can be reduced elsewhere in the economy, and/or technological
570 alternatives to fossil-fuelled aviation will soon be available, and/or flights can be 'offset' (see
571 for example IATA, 2021); the use of hydrogen for home heating, in which gas companies
572 aggressively promote hydrogen-based solutions for home heating, and associated policies
573 (such as blending of hydrogen and methane; mandating 'hydrogen ready' boilers) despite a
574 strong expert consensus that hydrogen is not best suited to home heating, and should be
575 used for different applications such as industrial uses, with electric heat pumps offering a
576 better alternative (Rosenow, 2022); and reliance on GHG removals as 'offsets' to
577 compensate for GHG emissions which could have been avoided through other means (see
578 section 3.5 above).

579 In each of these cases, the evidence points strongly to one conclusion. Yet in each, a false
580 balance is promulgated, ensuring a lively debate in media and policy circles and through
581 legal battles, mirroring the process surrounding the Cumbria mine. Some involved in such
582 debates will be acting in good faith, trying to grapple with a confusing picture. Others will be
583 purposefully introducing complex and conflicting evidence and argumentation, in order to
584 further commercial aims. Whatever the motivation, the overall situation created is one of
585 confusion and uncertainty, slowing the speed of the transition to net zero, creating lengthy
586 legal battles, and putting climate targets in jeopardy.

587 There are two ways in which these situations could be avoided. First, UK climate legislation
588 could be changed to remove ambiguity and complexity. Second, greater weight could be
589 placed on the quality of evidence used in decision-making. These are discussed in turn
590 below.

591 **6.1 Removing ambiguities in climate legislation**

592 As described above (Section 3) UK climate legislation contains many ambiguities. While the
593 Climate Change Act sets an admirably clear trajectory for GHG emissions over time, the
594 targets and carbon budgets are economy-wide, with little clarity on the relative
595 responsibilities of different government departments, sectors of the economy, or balance
596 between GHG reductions and GHG removals. The following changes would contribute:

- 597 • Setting a Net-Zero 'test' for all major developments – this was a recommendation in
598 the recent independent Skidmore Review (Skidmore, 2023)
- 599 • Legislation to prevent the opening of new fossil fuel extraction sites, following the
600 example of Wales, who have stated they will not issue permits for new coal mines

- 601 (Erickson, Lazarus and Piggot, 2018) and in line with the recommendations of the
602 Environmental Audit Committee (2022)
- 603 • Specific climate targets, responsibilities and powers for local areas on climate
604 change, as recommended by the Climate Change Committee, Skidmore Review and
605 many independent commentators (Kuriakose *et al.*, 2022).
 - 606 • Clear responsibilities on climate, linked directly to the CCA budget-setting process,
607 for all government departments and agencies, as recommended by the Climate
608 Change Committee (2021)
 - 609 • A review of the National Planning Policy Framework, to make clear the links between
610 the NPPF and the Climate Change Act, and to specify how all classes of GHG
611 emissions (see Section 3.4) should be taken into account when making planning
612 decisions
 - 613 • Separate targets for GHG reductions and removals, enshrined in the CCA budget-
614 setting process (McLaren *et al.*, 2019).

615 **6.2 The quality of evidence used in decision-making**

616 The problem of false balance could be lessened through greater attention being placed on
617 the quality of evidence used in decision-making. There are already-established markers of
618 evidential quality. These include academic peer-review, and publication in quality academic
619 journals; judgements of the standing, independence and expertise of individual specialists;
620 and evidence produced by reputable national and international bodies, such as publicly-
621 funded agencies, international organisations such as UN organisations, the
622 Intergovernmental Panel on Climate Change. These are not failsafe indicators of quality.
623 Problems with academic peer-review are well-rehearsed; publicly-funded agencies differ in
624 their independence from government or political groupings; some experts with high standing
625 are wrong. Notwithstanding these problems, the quality of the evidence presented should be
626 a material consideration in decision-making processes. For example, in the Public Inquiry on
627 Woodhouse Colliery, an array of credible experts on climate change, presenting evidence
628 from peer-reviewed or independent sources, should not have been dismissed in favour of
629 the accounts given by the mining company and its consultants who were not climate
630 specialists.

631 A further issue to take into account is the independence of witnesses and evidence provided
632 to policymakers and legal processes such as the Public Inquiry. This is not to say that paid
633 consultants, authoring reports and/or appearing as expert witnesses, are automatically less
634 reliable or less independent. Consultancy can be a useful and necessary way of
635 supplementing in-house expertise. However, there should be greater transparency about
636 financial links and other interests. At the very least, such links should be declared routinely,
637 and taken into account in decision-making.

638 Reducing the ambiguities in current climate legislation, and paying closer attention to the
639 quality of evidence used in climate decision-making, would result in quicker and more
640 predictable decisions, and less recourse to lengthy legal battles. This is essential, given the
641 rapid GHG reduction required to meet the net zero goal, and to provide businesses with the
642 certainty and predictability that they require in order to invest in that transition.

643

644

645 -----

646

647 **Funding and acknowledgement:** This work was supported by UKRI grant number MR /
648 TO22884/1. With thanks to John Barrett and Ciara Shannon for advice and input.

649 **Data availability statement:** no original data was generated for this paper.

650 **Conflicts of Interest:** There are no financial conflicts of interests or competing interests. As
651 discussed in the paper, I assisted independent expert witnesses in providing evidence to the
652 Public Inquiry, on areas including the link to climate legislation; prospects for steel industry
653 decarbonisation; and international diplomacy issues. I do not regard this as a conflict of
654 interest but I declare it for the purposes of transparency.

655 **Ethics approval:** Ethics approval was not needed for this research as it used secondary
656 data.

657

658 **References**

659 Anderson, K. and Peters, G. (2016) 'The trouble with negative emissions',
660 *Insights/Perspectives*, 182. doi: 10.1007/s10484-016-1770-6.

661 Barrett, J. *et al.* (2013) 'Consumption-based GHG emission accounting: a UK case study',
662 *Climate Policy*, 13(4), pp. 451–470. doi: 10.1080/14693062.2013.788858.

663 Climate Change Committee (2021) 'The Sixth Carbon Budget: The UK's Path to Net Zero'.
664 Available at: <http://files/4596/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero-1.pdf>.

665 Environmental Audit Committee (2022) *Accelerating the transition from fossil fuels and*
666 *securing energy supplies*.

667 Cumbria Action for Sustainability (2023) 'Zero Carbon Cumbria Programme'. Available at:
668 <https://cafs.org.uk/our-projects/zero-carbon-cumbria-programme/>.

669 Department for Environment, F. and R. A. (2022) *Carbon footprint for the UK and England to*
670 *2019*. Available at: [https://www.gov.uk/government/statistics/uks-carbon-footprint/carbon-](https://www.gov.uk/government/statistics/uks-carbon-footprint/carbon-footprint-for-the-uk-and-england-to-2019)
671 [footprint-for-the-uk-and-england-to-2019](https://www.gov.uk/government/statistics/uks-carbon-footprint/carbon-footprint-for-the-uk-and-england-to-2019).

672 Dunlap, R. E., McCright, A. M. and Yarosh, J. H. (2016) 'The Political Divide on Climate
673 Change: Partisan Polarization Widens in the U.S.', *Environment*, 58(5), pp. 4–23. doi:
674 10.1080/00139157.2016.1208995.

675 Erickson, P., Lazarus, M. and Piggot, G. (2018) 'Limiting fossil fuel production as the next
676 big step in climate policy', *Nature Climate Change*. Nature Publishing Group, 8(12), pp.
677 1037–1043. doi: 10.1038/s41558-018-0337-0.

678 Fahy, D. (2017) 'Objectivity, False Balance, and Advocacy in News Coverage of Climate
679 Change', *Oxford Research Encyclopedia of Climate Science*.

680 Greater London Authority (2023) 'Zero Carbon London'. Available at:
681 [https://www.london.gov.uk/programmes-strategies/environment-and-climate-change/climate-](https://www.london.gov.uk/programmes-strategies/environment-and-climate-change/climate-change/zero-carbon-london)
682 [change/zero-carbon-london](https://www.london.gov.uk/programmes-strategies/environment-and-climate-change/climate-change/zero-carbon-london).

683 Hickman, L. (2018) 'BBC issues internal guidance on how to report climate change', *Carbon*
684 *Brief*, 7 September. Available at: [https://www.carbonbrief.org/exclusive-bbc-issues-internal-](https://www.carbonbrief.org/exclusive-bbc-issues-internal-guidance-on-how-to-report-climate-change/#:~:text=What's the BBC's position%3F,denier)
685 [guidance-on-how-to-report-climate-change/#:~:text=What's the BBC's position%3F,denier](https://www.carbonbrief.org/exclusive-bbc-issues-internal-guidance-on-how-to-report-climate-change/#:~:text=What's the BBC's position%3F,denier)
686 to balance the debate.

687 HM Government (2022) 'United Kingdom of Great Britain and Northern Ireland's Nationally
688 Determined Contribution', in. doi: 10.1007/978-3-211-72882-6_56.

689 IATA (2021) *Our Commitment to Fly Net Zero by 2050*. Available at:
690 <https://www.iata.org/en/programs/environment/flynetzero/>.

691 Intergovernmental Panel on Climate Change (2021) 'IPCC Sixth Assessment Report,
692 Working Group 1, Physical Science Basis', pp. 673–816.

693 Intergovernmental Panel on Climate Change (2023) *Synthesis Report of the IPCC Sixth*
694 *Assessment Report (AR6)*.

695 International Energy Agency (2021) 'Net Zero by 2050: A Roadmap for the Global Energy
696 Sector', *International Energy Agency*, p. 224. Available at: www.iea.org/t&c/.

697 Kirby, D. (2021) "World's first net-zero coal mine" planned for Cumbria is condemned by the
698 carbon offsetters it hopes to use', *the I Newspaper*, 10 September. Available at:
699 [https://inews.co.uk/news/environment/net-zero-coal-mine-cumbria-gold-standard-](https://inews.co.uk/news/environment/net-zero-coal-mine-cumbria-gold-standard-condemned-carbon-climate-chan-1191140)
700 [condemned-carbon-climate-chan-1191140](https://inews.co.uk/news/environment/net-zero-coal-mine-cumbria-gold-standard-condemned-carbon-climate-chan-1191140).

701 Koehler, D. (2016) 'Can journalistic "false balance" distort public perception of consensus in
702 expert opinion?', *Journal of Experimental Psychology: Applied*, 22(1), pp. 24–38. doi:
703 <https://doi.org/10.1037/xap0000073>.

704 Kuriakose, J. *et al.* (2022) 'What does the Paris climate change agreement mean for local
705 policy? Downscaling the remaining global carbon budget to sub-national areas', *Renewable*
706 *and Sustainable Energy Transition*. Elsevier Ltd, 2(July), p. 100030. doi:
707 [10.1016/j.rset.2022.100030](https://doi.org/10.1016/j.rset.2022.100030).

708 Lamb, W. F. *et al.* (2020) 'Discourses of climate delay', *Global Sustainability*. Cambridge
709 University Press, 3. doi: [10.1017/SUS.2020.13](https://doi.org/10.1017/SUS.2020.13).

710 Manchester City Council (2023) *Zero Carbon Manchester*. Available at:
711 https://www.manchester.gov.uk/info/500002/council_policies_and_strategies/3833/zero_carbon_manchester.
712 [on_manchester](https://www.manchester.gov.uk/info/500002/council_policies_and_strategies/3833/zero_carbon_manchester).

713 Markusson, N. *et al.* (2022) 'Life in the hole: practices and emotions in the cultural political
714 economy of mitigation deterrence', *European Journal of Futures Research*. Springer Science
715 and Business Media Deutschland GmbH, 10(1). doi: [10.1186/s40309-021-00186-z](https://doi.org/10.1186/s40309-021-00186-z).

716 McGlade, C. and Ekins, P. (2015) 'The geographical distribution of fossil fuels unused when
717 limiting global warming to 2 °C', *Nature*, 517(7533), pp. 187–190. doi: [10.1038/nature14016](https://doi.org/10.1038/nature14016).

718 McLaren, D. P. *et al.* (2019) 'Beyond "Net-Zero": A Case for Separate Targets for Emissions
719 Reduction and Negative Emissions', *Frontiers in Climate*, 1. doi: [10.3389/fclim.2019.00004](https://doi.org/10.3389/fclim.2019.00004).

720 Ministry of Housing Communities & Local Government (2012) *National Planning Policy*
721 *Framework*. Available at: <http://forms.communities.gov.uk/3>.

722 Offshore Energy UK (2022) *Exploration Insight 2022*.

723 Rietdijk, N. and Archer, A. (2021) 'Post-Truth, False Balance and Virtuous Gatekeeping', in
724 Snow, N. and Vaccarezza, M. S. (eds) *Virtues, Democracy and Online Media: Ethical and*
725 *Epistemic Issues*.

726 Rosenow, J. (2022) 'Is heating homes with hydrogen all but a pipe dream? An evidence
727 review', *Joule*, 6(10), pp. 2225–2228.

728 Skidmore, C. (2023) *Mission Zero - Independent Review of Net Zero*.

729 Trout, K. *et al.* (2022) 'Existing fossil fuel extraction would warm the world beyond 1.5 °C',
730 *Environmental Research Letters*. IOP Publishing, 17(6), p. 064010. doi: [10.1088/1748-](https://doi.org/10.1088/1748-9326/AC6228)
731 [9326/AC6228](https://doi.org/10.1088/1748-9326/AC6228).

- 732 United Nations (2015) 'Paris Agreement'. Available at:
733 https://unfccc.int/sites/default/files/english_paris_agreement.pdf.
- 734 United Nations (2022a) *Emissions Gap Report 2022, Emissions Gap Report 2022*. Available
735 at: <https://www.unenvironment.org/interactive/emissions-gap-report/2019/>.
- 736 United Nations (2022b) *Secretary-General Warns of Climate Emergency, Calling*
737 *Intergovernmental Panel's Report 'a File of Shame', While Saying Leaders 'Are Lying',*
738 *Fuelling Flames*. Available at: <https://press.un.org/en/2022/sgsm21228.doc.htm>.
- 739 Welsby, D. *et al.* (2021) 'Unextractable fossil fuels in a 1.5 °C world', *Nature*. *Nature*
740 *Research*, 597(7875), pp. 230–234. doi: 10.1038/s41586-021-03821-8.
- 741 West Cumbria Mining (2022) 'WCM Statement of Case'.
- 742 Willis, R. *et al.* (2019) 'Getting energy governance right: Lessons from IGov'. Available at:
743 <http://files/3732/Willis et al. - Getting energy governance right.pdf>.
- 744