

# ISEE-ERS-ELF statement on the planned construction and operation of the Woodhouse Colliery coal mine, Cumbria, UK

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## Executive summary

Turning back to coal not only damages population health overall but it also exacerbates social inequalities in health. Air pollution, climate change and ecosystem damage from coal disproportionately affect socio-economically deprived communities, thus exacerbating existing health inequalities within society, both in the UK and overseas. Therefore, we request:

1. Re-evaluation of the air quality assessment using up-to-date air quality guidelines;
2. Adequate evaluation of human health impacts across the continuum of the coal use, including health effects of *air pollution, climate change* and *ecosystem damage* from coal combustion (including offshore);
3. Investment in green jobs to avoid a post-industrial economic depression for Cumbrians;
4. Transparency on the end-use of coal extracted from the Woodhouse Colliery.

## Planning permission approved for the Woodhouse Colliery

Despite widespread opposition on economic and environmental grounds, planning permission for a new underground metallurgical coal mine near Whitehaven, West Cumbria, was approved by the UK Secretary of State for Levelling Up, Housing and Communities, Michael Gove, on the 7<sup>th</sup> December, 2022.<sup>1</sup> The coal mine, also known as the Woodhouse Colliery, is anticipated to create approximately 500 jobs, although experts have warned that these jobs may not be secure,<sup>2-4</sup> given the momentum to phase out coal in Europe,<sup>5</sup> and beyond. Financially, the investment may create a stranded asset,<sup>6</sup> and, politically, the decision subverts the UK's commitment to tackle the most important global issue of our times – climate change.<sup>7</sup> From a public health perspective, the construction and operation of the coal mine would result in health burdens from *air pollution, climate change and ecosystem damage*, which would increase morbidity and mortality risk at local, national and global scales.

## Air pollution

Coal is the dirtiest of all fossil fuels. During its combustion, noxious gas and particles are released into the atmosphere. According to a 2021 report by the Health Effects Institute, fossil fuel combustion, a major source of air pollution, contributed to more than one million deaths globally in 2017, which is more than 27% of all deaths from outdoor fine particulate matter (aerodynamic diameter  $<2.5\mu\text{m}$ ;  $\text{PM}_{2.5}$ ).<sup>8</sup> In a 2021 World Bank Report on both short-term and long-term air pollution exposure studies,<sup>9</sup> air pollution components that came from coal combustion and diesel vehicles were found to be most consistently associated with cardiovascular mortality, especially mortality due to ischemic heart disease (i.e., heart attacks).<sup>10–12</sup> Coal combustion is particularly harmful for human health due to its composition: the acidic sulphur and transition metals (Ni, V, Fe, and Cu) found in coal combine to form an especially toxic aerosol mixture.<sup>13</sup> Additionally, coal pollution not only impacts health through its combustion, but also its extraction and transportation. In a 2020 review by Michael Hendryx and colleagues,<sup>14</sup> coal mining, processing, combustion and waste disposal result in adverse public health impacts, which include cancer, cardiovascular disease, respiratory disease, kidney disease, mental health problems, and adverse birth outcomes.<sup>15–19</sup>

According to a West Cumbria Mining Ltd statement,<sup>20</sup> the construction and operation of the Woodhouse Colliery mine will not cause air pollution levels to exceed England's Air Quality Standards Regulations 2010 limits.<sup>21,22</sup> The air pollutants primarily discussed in the environmental impact assessment were  $\text{NO}_2$  and  $\text{PM}_{10}$ , which according to the Air Quality Standards Regulations 2010 have an annual average limit value of  $40\mu\text{g}/\text{m}^3$  and  $40\mu\text{g}/\text{m}^3$ , respectively.<sup>21,22</sup> This is in line with the current European Union (EU) standards,<sup>23</sup> however, emitting pollution below these standards is *not a guarantee of no adverse health effects*, much like driving below the speed limit does not guarantee that a vehicle will not be involved in a fatal accident. Indeed, in the last two decades, an overwhelming body of evidence has shown that negative health effects are observed at much lower concentrations than the current EU standards. This was officially acknowledged by the World Health Organization (WHO) in their latest update of the WHO Air Quality Guidelines,<sup>24</sup> published in September 2021. WHO recommends more stringent annual average values of  $10\mu\text{g}/\text{m}^3$  and  $15\mu\text{g}/\text{m}^3$ , for  $\text{NO}_2$  and  $\text{PM}_{10}$ , respectively, to protect population health from the long-term effects of air pollution and showed health impacts even at levels below the guideline values. ISEE-ERS fully endorsed the updated guidelines in a statement, which received support from 100+ medical, public health, scientific societies and patient organizations.<sup>25</sup>

Since the publication of the 2021 WHO guidelines, several international and national bodies, have initiated procedures to review their standards. On October 26, 2022, the European Commission proposed revisions to the Ambient Air Quality Directives, to align EU air quality standards more closely with WHO recommendations.<sup>26</sup> EU standards have not yet been updated, however, the UK has issued post-Brexit air quality targets of  $10\mu\text{g}/\text{m}^3$  for annual average  $\text{PM}_{2.5}$ , which must be met across England by 2040.<sup>27</sup> The use of the Air Quality Standards Regulations 2010 in the Woodhouse Colliery's environmental impact assessment fails to provide the best

available estimate of health. We recommend the use of the 2021 WHO guideline levels or the lowest measured air pollution concentrations (approximately 50% of guideline levels) in health impact assessments, not legal standards. We argue, therefore, that the air quality assessment underestimated the local health burden of air pollution associated with construction and operation of the coal mine.

Finally, extracting coal in the UK and renouncing responsibility of the end-use and downstream health consequences, as proposed in the planning decision letter by the UK housing and communities secretary,<sup>1</sup> is socially and ethically unjustifiable, particularly in the light of the UK's substantial overseas investments to aid lower-income countries in transitioning away from coal (e.g. \$8.5 billion commitment to South Africa in 2021).<sup>28</sup> The current UK government understands the public health costs of air pollution, which is the largest environmental risk to public health in the UK, with 28,000 to 36,000 deaths every year attributed to air pollution from anthropogenic sources, according to the government's own website.<sup>29</sup> The lack of transparency regarding the end-use of the coal extracted in West Cumbria means that air pollution from the combustion of Woodhouse Colliery coal cannot be adequately quantified in a health impact assessment. Moreover, extracting UK coal and exporting it to less strictly regulated nations where it may be burned for power – by exploiting regulatory loopholes on downstream emissions (IR21.106)<sup>1</sup> – disregards the right of all humans to a safe, clean, healthy and sustainable environment.<sup>30</sup>

## Climate change

Phasing out fossil fuel can have health co-benefits by simultaneously lowering Greenhouse Gas (GHG) emissions and thus, mitigating climate change, and reducing air pollution. Climate change is already affecting millions, globally. There is an overwhelming body of evidence connecting GHG emissions with climate change and extreme weather events, including floods, heatwaves, droughts, and storms.<sup>31</sup> Between 1970 and 2019, more than 11,000 climate-related disasters occurred globally, causing almost two million deaths and around US\$ 3.64 trillion in losses.<sup>31</sup> Left unabated, global emissions could contribute to nine million annual climate-related deaths by the end of the century.<sup>32</sup> In addition, the incidence of climate-related communicable and non-communicable diseases (e.g. food-borne, water-borne, vector-borne diseases, allergies) and mental health impacts (e.g. from extreme events and their consequences such as forced migration, malnutrition, collapse of health and social systems, economic strains and losses, famine, ecological distress and grief) will continue to increase.<sup>32</sup>

Reduction of GHG emissions to mitigate climate change and its consequences on human and planetary health is a major global priority. Coal combustion is the largest source of GHG emissions, worldwide, and a major contributor to climate change. Thus, phasing out of coal is vital to protect population health and keep within 1.5°C of global warming, as agreed in the Paris Agreement.<sup>33</sup> In the Inspector's environmental impact assessment of the Woodhouse Colliery, a total of 18,431t CO<sub>2</sub> equivalent (CO<sub>2</sub>-eq) emissions were estimated for the construction, operation and decommissioning of the mine.<sup>20</sup> The UK Climate Change Committee (CCC), an independent expert group that advises the government, has estimated that the Woodhouse Colliery coal mine will

increase UK emissions by 0.4Mt CO<sub>2</sub>-eq per year, which represents more than all emissions projected from open UK coal mines to 2050.<sup>7</sup> Moreover, West Cumbria Mining Ltd stated that they will install a methane capture mechanism to potentially eliminate the majority of methane emissions, however, they projected 1,103,701t CO<sub>2</sub>-eq emissions<sup>1</sup> from methane released during operation under a best case, or “Likely Mitigated”, scenario,<sup>34</sup> and they did not estimate methane release after mining operations have ceased (a.k.a abandoned mine methane<sup>35</sup>). Methane is amongst the six major GHG considered in the UK Climate Change Act 2008<sup>36</sup> and so, the reduction of its emissions is a priority in UK’s Net Zero target by 2050.<sup>37</sup> At the 2021 Conference of the Parties (COP26), held in Glasgow, UK, globally phasing out coal for energy production was one of the primary objectives of the UK COP presidency, and was pledged by 190 countries.<sup>38,39</sup> Overall, the emissions resulting from this coal mine will contribute negatively to the global carbon budget and starkly contradict the UK’s own climate change commitments pledged on a global stage at COP26.

The impacts of the mine extend far beyond the UK, affecting many other communities overseas, an aspect ignored during the planning approval. West Cumbria Mining Ltd initially proposed that the coal extracted from the Woodhouse Colliery would be used by national steel manufacturers, which they argued would provide substantial CO<sub>2</sub> emission savings compared to importing coal. However, as aforementioned, due to its high sulphur content and decarbonisation of the UK steel industry, it’s estimated that more than 85% of coal production will be internationally exported.<sup>7</sup> Therefore, the CO<sub>2</sub>-eq contributions estimated above ignore a substantial amount of CO<sub>2</sub> emissions associated with the international transport and burning of the coal overseas steel production plants (or potentially for power generation). It is important to note the shortsightedness and hypocrisy of a G7 country ignoring the end-use of coal in CO<sub>2</sub> budgeting.

In short, GHG emissions resulting from the Woodhouse Colliery mine and its associated activities will add to the global GHG budget, worsening climate change, globally. UK climate legislation has established 2050 as the year when the UK will reach Net Zero emissions.<sup>37</sup> Woodhouse Colliery is scheduled to operate until 2049, which will technically allow the UK government to achieve 2050 Net Zero. Yet, this approach misses a crucial opportunity to safeguard local and national population health by mitigating climate change through a just transition to green jobs and industry. Extracting coal fundamentally goes against global efforts to cut GHG emissions to safeguard the wellbeing of all our communities and the planet.

## **Ecosystem damage**

Ecological and social stability depend on today’s decisions on climate and the environment.<sup>40</sup> The South Lakes Action on Climate Change group observed that construction of the planned coal mine would cause, “destruction of an area of ancient woodland”,<sup>41</sup> resulting in losses in biodiversity, ecosystem services and carbon storage, which are crucial for planetary and thus human health. In acknowledgement, planning permission was granted on the basis that the coal mine will be

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<sup>1</sup> A carbon dioxide equivalent “or CO<sub>2</sub> equivalent, abbreviated as CO<sub>2</sub>-eq is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential”. Definition from EUROSTAT glossary.

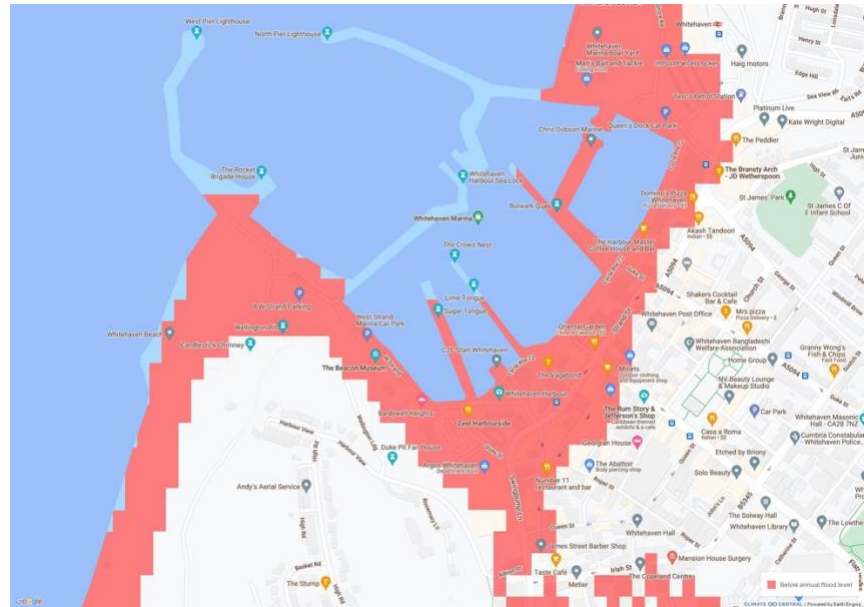
constructed using “pipe-jacking”, which will tunnel beneath the identified woodlands to reduce local biodiversity impacts.<sup>1</sup> Local aquatic biodiversity impacts have also been assessed during the planning application process.<sup>1</sup> However, given that the extracted coal will be burned, impacts on ecosystem damage and health have not been adequately considered. Coal combustion is a major source of marine mercury pollution,<sup>42</sup> which bioaccumulates in tissues as methylmercury as it passes up the food chain. Human exposure to methylmercury through fish consumption (e.g., tuna) is associated with cardiovascular disease and dementia risk in adults, and can severely impair *in utero* development of infants.<sup>42</sup> In the US alone, 317,000 and 637,000 babies are born each year with losses of cognitive function that are the consequence of prenatal exposures to methylmercury resulting from consumption of mercury-contaminated fish by their mothers during pregnancy.<sup>43</sup> We recommend quantification of the ecosystem damage and associated human health impacts of Woodhouse Colliery coal, which includes impacts from burning of the coal overseas.

## A post-industrial future for West Cumbria

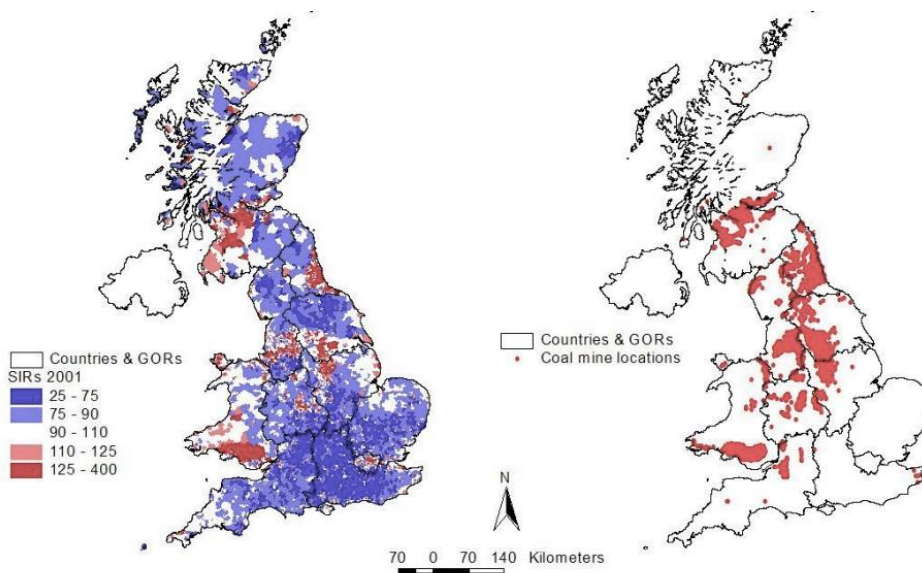
According to the World Health Organization (WHO), health inequalities are, “systemic differences in the health status of different population groups”.<sup>44</sup> Here, it is important to emphasise that health is, “a state of complete physical, mental, and social well-being and not merely the absence of disease”.<sup>44</sup> In a review of evidence, Morrice and Colagiuri concluded that there is strong and substantial evidence of environmental, health and social injustices associated with coal mining.<sup>45</sup> West Cumbria Mining Ltd stated that the coal mine would improve mental health, however, based on evidence, the mental health of the local community may be negatively affected by the mine in both the short- and long-term. Land degradation and adverse changes to the character of the local environment have been linked with psychological distress; this phenomenon has specifically been documented in mining communities.<sup>46,47</sup> Moreover, the short prospect of employability by the Woodhouse Colliery, which will shut down by 2049, is likely to have a detrimental impact on the community’s mental health and wellbeing in anticipation of, and following, closure of the mine. By building a coal mine, the UK government is obsolete industrial future for West Cumbria. This future could be avoided by prioritizing green jobs, which have the potential to create up to 3,800 jobs in the local region (Allerdale, Copeland and Barrow) in comparison to the 500 temporary jobs offered by the coal mine.<sup>48</sup>

Although the socio-economically deprived condition of the local population has been used by West Cumbria Mining Ltd to leverage approval of the coal mine, up to 80% of the jobs are skilled and require training and cannot be guaranteed to be given to Cumbrians, which was acknowledged in the planning approval.<sup>1</sup> Additionally, the health impacts of climate and ecological breakdown fall most heavily upon those who are the most socioeconomically deprived. Climate Central, an independent group of climate experts, has projected the area of Whitehaven, West Cumbria, that will be below the annual flood line in 2050 (Figure 1).<sup>49</sup> We argue that extracting coal near Whitehaven until 2049, irrespective of where the coal is burned, will contribute to climate change and is not compatible with the future health and wellbeing of the local Cumbrian population.

**Figure 1.** Area of Whitehaven, West Cumbria, that is projected to be below the annual flood line in 2050 (downloaded from Climate Central website, January 6, 2023).<sup>49</sup>



Finally, regarding occupational and local health, the emission of hazardous particles during mining is particularly of concern for Woodhouse Colliery workers, of which 80% will work underground,<sup>50</sup> potentially exposed to hazardous levels of pollution. Coal mine dust exposure is associated with several chronic respiratory diseases, including coal miners' pneumoconiosis, also known as black lung, which is a progressively disabling disease that is responsible for ~1000 deaths in the US each year.<sup>51</sup> Overall, coal miners are found to be more likely to suffer from a limiting long-term illness (LLTI) than people in non-manual employment.<sup>52</sup> Additionally, in Great Britain, LLTI was more prevalent in areas of England, Wales and Scotland where there had been a historically operating coal mine within the local authority; LLTI prevalence increased with decreasing distance to the historic coal mine site, suggesting a dose-response effect (Figure 2).<sup>53</sup>



**Figure 2.** Standardized limiting long-term illness (LLTI) ratios (left) and coal mine locations (right). Individuals living in red areas (left) are more likely to have a LLTI than those living in white/blue areas.<sup>53</sup>

## Conclusion

The harm to communities, locally, nationally, and globally, that will result from the construction and operation of the Woodhouse Colliery are clear. Consequently, the undersigned societies urge the government to reconsider their decision. Given the health consequences associated with the construction and operation of the Woodhouse Colliery coal mine in Cumbria, UK, we hope that our requests will be considered.

## Our requests

1. Re-evaluation of the air quality assessment using up-to-date air quality guidelines.
2. Adequate evaluation of human health impacts across the continuum of the coal use, including health effects of air pollution, climate change and ecosystem damage from coal combustion (including offshore).
3. Investment in green jobs to avoid a post-industrial economic depression for Cumbrians.
4. Transparency on the end-use of coal extracted from the Woodhouse Colliery.

## Who we are

The [International Society for Environmental Epidemiology \(ISEE\)](#) is a scientific association of experts who specialize in environmental exposure assessment and human health. The society was established in 1987 and currently has over 2000 active members. Since it was founded, ISEE has impacted research, training, and policy, worldwide. Our Mission is to foster epidemiological studies on the effects of environmental exposures on people, stimulate communication between health professionals, promote methodological advances, and strengthen environmental health policy.

The [European Respiratory Society \(ERS\)](#) is an international organization that brings together physicians, other healthcare professionals, epidemiologists, patient representatives, scientists and other experts working in respiratory medicine. We are one of the leading medical organizations in the respiratory field, with a growing membership representing over 160 countries. Our mission is to promote lung health and alleviate suffering from disease, and drive standards for prevention of respiratory diseases as well as respiratory medicine globally. Science, education, and advocacy are at the core of everything we do.

The [European Lung Foundation \(ELF\)](#) is a patient-led organisation that works internationally to bring patients and the public together with healthcare professionals to improve lung health and advance diagnosis, treatment, and care.

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