

Climate Change and Minerals Planning – Mitigation

Climate change mitigation involves reducing greenhouse gas emissions and thus contributing to achieving net zero and to limiting global warming and associated climate change.

Minerals and mineral products are also critical to delivery of mitigation through providing the materials for construction and various technologies including renewable energy installations and equipment, achieving thermal mass and insulation and efficiency of new buildings.

The routes for achieving 'net zero' involve reducing emissions and removing/sequestering greenhouse gases from the atmosphere.

Assessment

In order to identify how to reduce emissions, as part of a climate change assessment that may be required to support a planning application including through Environmental Impact Assessment¹, it will be necessary to understand and quantify what these are and where they are generated.

Estimation and collection of reliable energy use data (electricity, gas, vehicle and machinery fuel) at site level therefore will be of critical importance, with conversion rates applied to derive associated greenhouse gas emissions² which may be compared against a baseline (without mitigation).

Various methodologies^{3,4} may be employed to assess emissions anticipated throughout the life of the project. The types of emissions assessed need to include:

- Direct (Scope 1) relating to combustion of fossil fuels by the reporting company, for example in machinery and vehicles;
- Indirect (Scope 2) associated with the consumption of purchased energy and emitted from sources outside of the reporting company's ownership; and
- Other indirect emissions (Scope 3) relating to up- or down-stream activities in the value/supply chain out of the reporting company's ownership or control⁵.

1 For example, IEMA (2017) EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance <https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance>

2 <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021>

3 Defra/DECC (2009) Guidance on how to measure and report your greenhouse gas emissions https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69282/pb13309-ghg-guidance-0909011.pdf

4 Defra Small Business User Guide: Guidance on how to measure and report your greenhouse gas emissions https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69494/pb13310-ghg-small-business-guide.pdf

5 See also https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf



Scope 3 emissions are often the largest but difficult to assess. In light of recent case law⁶, consideration should be given to whether there is a causative link between the development (including extraction of materials) and climate change consequences from Scope 3 emissions, and whether these would be inevitable and significant, as part of the EIA process. This may be particularly important where a proposed quarry development will produce raw materials that will only or largely be used as feedstock in industrial processes, including cement manufacture, that are likely to result in high carbon emissions. If the causative link is not clear, the effects are not capable of assessment, and would not be likely to be significant, and so deemed to be out-of-scope, the justification should be clearly presented on the Scoping phase.

Mitigation

Mineral extraction requires use of heavy machinery in the movement of soil and overburden, the extraction of material, its transportation within a site, its processing and transport onwards to market. These activities typically rely on fossil fuels and so result in emissions of carbon dioxide.

Responses to mitigate the effects of extraction may be strategic, in terms of site location and selection, and more specific at the operational and site level. Minerals can only be extracted where they occur. Development plans normally apply criteria and SEA to identify the most appropriate strategy and location for new mineral extraction (Areas of Search, Preferred Areas and specific sites) which will include accessibility and transport options.

The transport of mineral to market, particularly by road, is likely to represent the largest consumption of fossil fuel and so the consequent emission of greenhouse gases. While land-won sand and gravel is generally supplied relatively locally, access to rail or water, including use of existing infrastructure, provide for lower carbon transport options over longer distances, especially for rock. Industrial minerals and specialist minerals products such as dimension stone routinely supply more distant and international markets.

At the site level, mitigation measures include (see over):

6 For example, the 2024 Supreme Court judgement <https://www.supremecourt.uk/cases/uksc-2022-0064> on the 'Finch' case that Scope 3 emissions from hydrocarbon extraction must be considered in EIA and taken into account in decision making, if there is a causative link between resource extraction and inevitable and significant carbon consequences of their intended use. The case concerned extraction of oil where the causative link and inevitable effects was demonstrated (as the oil would be combusted and generate greenhouse gas emissions). For other development types, it would be prudent to demonstrate that the causative link and inevitability of Scope 3 emissions has been considered and reasons for these being discounted or considered out-of-scope demonstrated.



Mitigation measure	Example Actions
Reducing energy use and improving energy efficiency	<p>Machinery upgrade to energy efficient equipment and vehicles when investments made.</p> <p>Building design and fabric – construction and renovation.</p> <p>Machinery and plant design, planned and preventative maintenance.</p> <p>Internal haulage routing, use of conveyors and pipelines, engine cut-off.</p> <p>Transport to market – use of rail or water where feasible, routeing and management to avoid idling and congestion.</p>
Selection and use of fuel type :	<p>Use of biogas, low-carbon hydrogen (dependant on development of supply and infrastructure⁷) or electrically-powered machinery and vehicles (dependant on de-carbonisation of electricity supply).</p> <p>Purchase of low carbon and renewably-generated electricity (green tariff).</p>
On-site generation and storage of renewable energy	On-site/estate renewables (solar, wind, biogas) to power on-site processes during the operational phase, or export to the Grid during operational phases and following restoration (Grid access may be a limiting factor).
Carbon capture and sequestration	Site and estate management, and site restoration – habitats commonly established as part of site restoration, especially woodland and scrub, heathland and meadows, and reedbeds - as well as arable are particularly effective at capturing and storing carbon ⁸ . Recent research ⁹ indicates that adding 'rock dust' or waste cement to croplands can also achieve large-scale additional sequestration.

7 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1011283/UK-Hydrogen-Strategy_web.pdf

8 Natural England (2021) Research Report NERR094 Carbon storage and sequestration by habitat: a review of the evidence (second edition) <http://publications.naturalengland.org.uk/publication/5419124441481216>

9 <https://www.sheffield.ac.uk/energy/news/applying-rock-dust-croplands-could-absorb-2-billion-tonnes-co2-atmosphere-research-shows>

The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and industrial sand industries.

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