A better understanding of carbon emissions from archaeological projects

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The last two years have seen significant progress by the archaeology sector towards better understanding, measuring and reporting on the carbon emissions it generates. This has principally been driven by the requirements that are starting to be put on organisations by clients to report their emissions or to show evidence of their commitment to reaching net zero, in particular by Tier 1 construction contractors and national agencies.

Although archaeology companies do not meet the requirements to legally report their energy use and carbon emissions through the Streamlined Energy and Carbon Reporting (SECR) policy, they undertake work as part of a supply chain.

Therefore, if not already, they will be required in the future to report their emissions to the organisations that contract them so they are included as part those organisations' emissions (Scope 3 emissions – services and goods provided). An example is National Highways (see page 14), which requires its supply chain (including archaeological companies) to report project-based emissions through the National Highways carbon calculator.

Archaeological contractors are also being asked to provide evidence to clients of their carbon footprint and carbon reduction plans, and to include considerations of carbon emission reductions in tenders.

The current biggest driver for change is therefore compliance – to meet clients' own net zero obligations. Archaeology companies are therefore now starting to think about how they can meet these requirements by

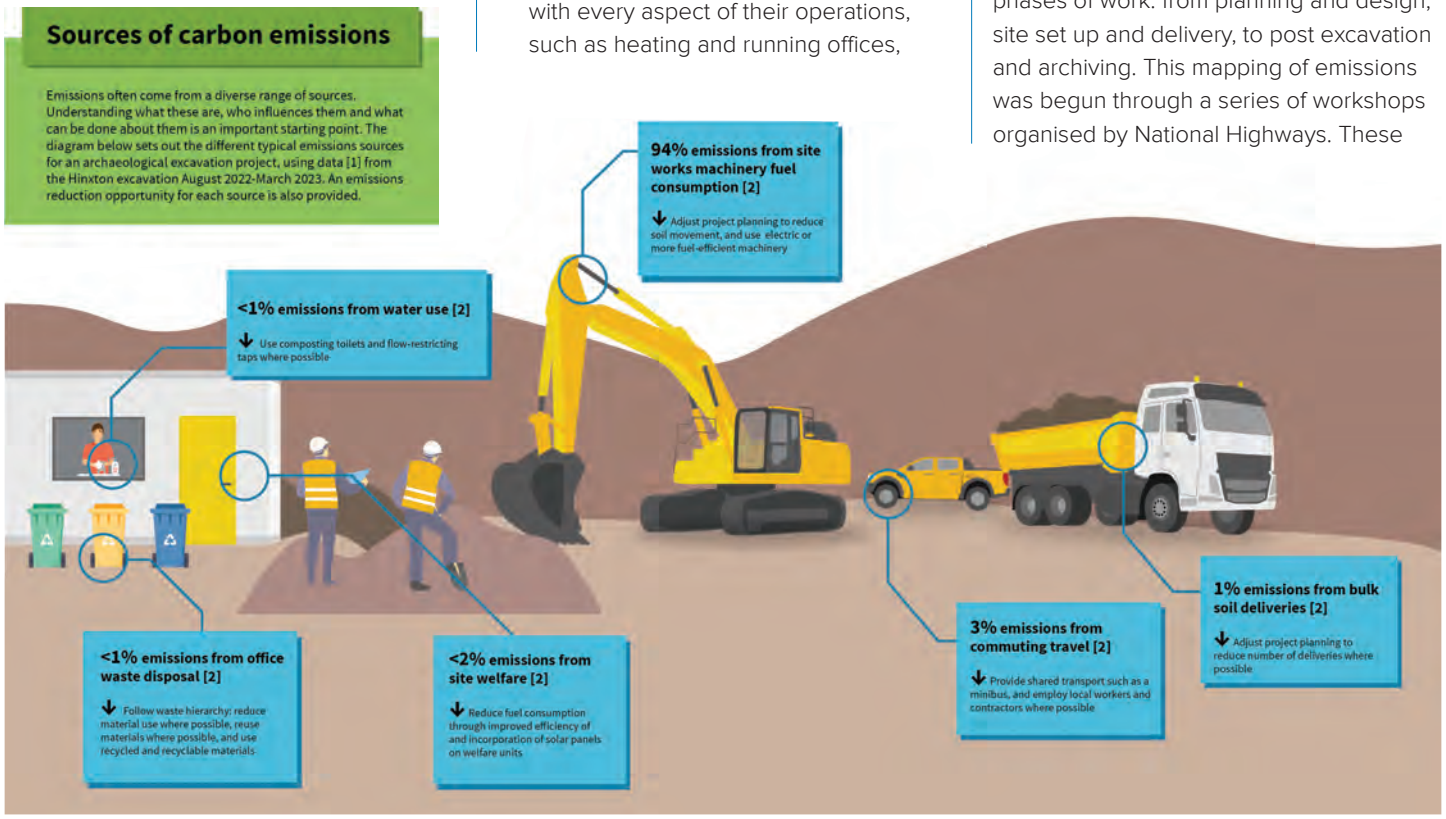
- measuring their own organisational carbon footprint – emissions associated with every aspect of their operations, such as heating and running offices, work vehicles, commuting, the consumption of goods and services (eg plant, machinery, welfare), etc
- developing carbon reduction plans which set out how companies aim to reduce their carbon emissions and meet net zero targets, through changes made to their systems, processes and behaviours

FAME and CIfA (supported by Historic England's Sector to Net Zero project) are helping archaeological companies with this, through the development of the archaeology carbon calculator (FAME – see page 12), the publication of the carbon reduction guide table, a carbon reduction online community and the roll-out of carbon literacy training (CIfA).

Identifying carbon emissions and their mitigation

The first step has been to identify what carbon emissions are generated by archaeological activities associated with all phases of work: from planning and design, site set up and delivery, to post excavation and archiving. This mapping of emissions was begun through a series of workshops organised by National Highways. These

Credit: Historic England



identified the emissions and potential carbon saving mitigations mapped against the National Highways project control framework (PCF) lifecycle. In parallel, the CIfA Climate Change Working Group has been producing the carbon reduction guide table, which sets out a number of different ways organisations can begin to reduce their carbon emissions and work more sustainably.

In addition, Historic England commissioned environmental sustainability consultants 3ADAPT to develop a series of infographics to highlight the carbon emissions generated from different areas of the heritage sector (using real heritage sector carbon emission data) and to suggest potential ways for carbon reduction. A series of infographics have been produced from across the broad spectrum of the heritage sector, including

- archaeological terrestrial excavations
- marine archaeological projects
- heritage attractions
- conservation
- food and catering
- conference and event organisation
- heritage coal use

Archaeology infographics

Data was provided by Oxford Archaeology on work carried out between August 2022 and March 2023 on the Wellcome Genome Campus in Hinxton ahead of the proposed expansion of the research campus. The site covered 12.4 hectares and the work generated a total of 230 tCo2e (tonnes of CO_2 equivalent) of carbon emissions (the equivalent of over 200 flights from London to New York, according to ChatGPT).

By far the largest percentage of the emissions generated were those from the site plant – 94 per cent, as fuel consumption; 3 per cent came from commuting and less than 2 per cent from the site welfare, water use, waste, etc.

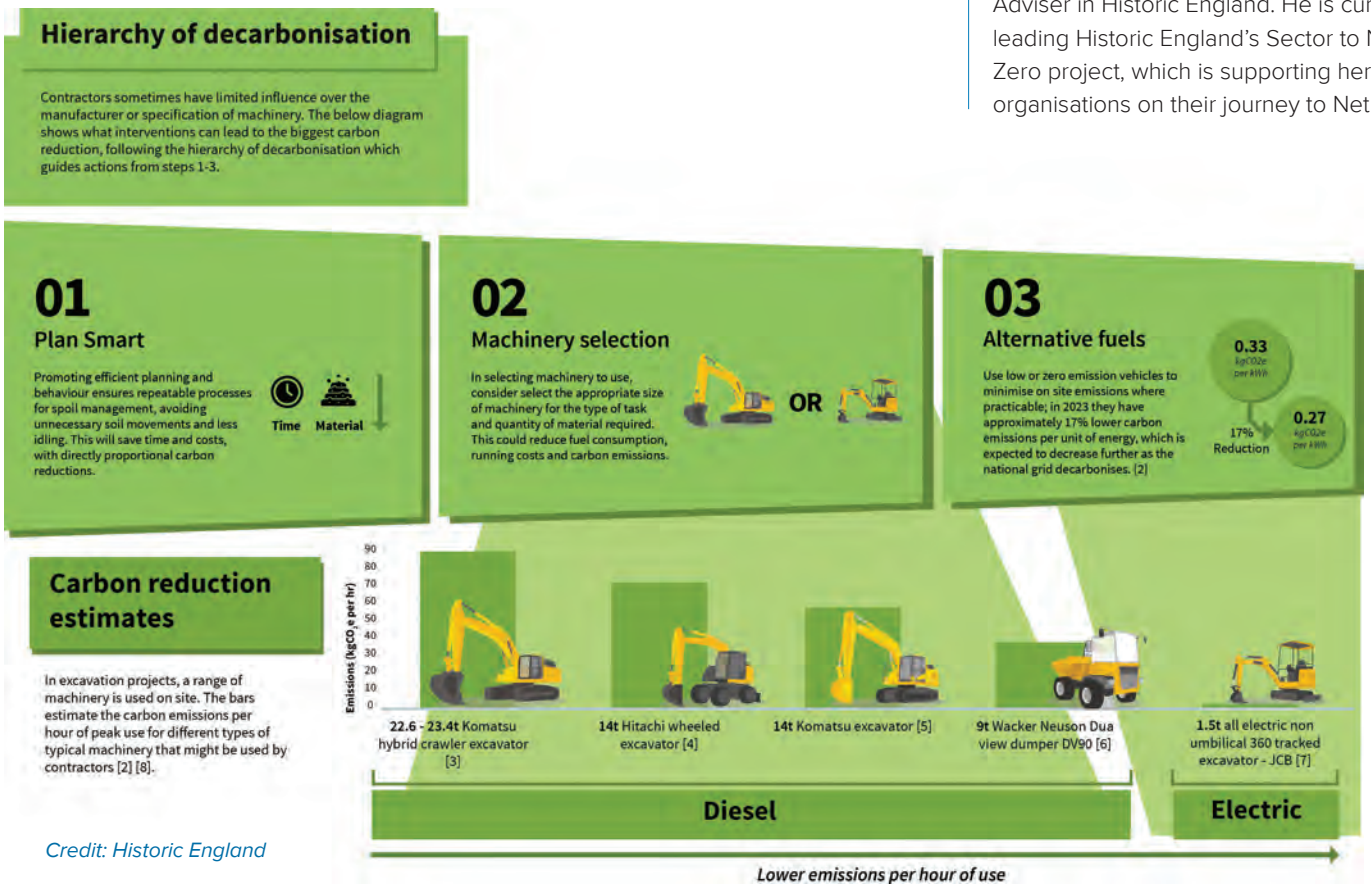
Another infographic was produced using construction plant data to provide a comparison of the amount of carbon emissions generated by different types of plant used. Not surprisingly, this shows that larger diesel excavators generate the most emissions.

3ADAPT made a number of suggestions on how to reduce emissions. The use of alternative fuels including HVO (a type of biofuel), hydrogen and electric will reduce emissions. Low or zero emission vehicles emit approximately 17 per cent less carbon per unit of energy (2023 figures). There are of course various logistical issues associated with this, such as machine capability, charging, the availability (and cost) of machinery, and contractual arrangements. Other savings can be made through improved planning and design of work – for example, through trench layout design, more efficient site vehicle and soil movements, spoil management and improved behaviours (eg less machine idling). These will all save time and costs as well as reduce carbon emissions.

This is just a snapshot of the infographics which are now available on the CIfA website at www.archaeologists.net/practices/archaeologists-and-climate-change. For further carbon reduction guidance, see the CIfA carbon reduction guide table which is also available via the link above.

Dan Miles

Dan is the Senior Sector Development Adviser in Historic England. He is currently leading Historic England's Sector to Net Zero project, which is supporting heritage organisations on their journey to Net Zero.



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