Climate change measures and the historic environment in Buckinghamshire

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How are climate change measures impacting the historic environment?

- Solar energy
- Tree planting projects
- Retrofitting historic buildings
- Embodied carbon

Solar farms

- Often large-scale, with landscape and archaeological impacts
- Panels fitted with piles, which can damage buried archaeology
- Associated infrastructure (electrical inverters, battery storage, buried cabling and access roads) can also be damaging
- Our approach – geophysical survey followed by targeted trial trenching
- Consider impact on historic landscape

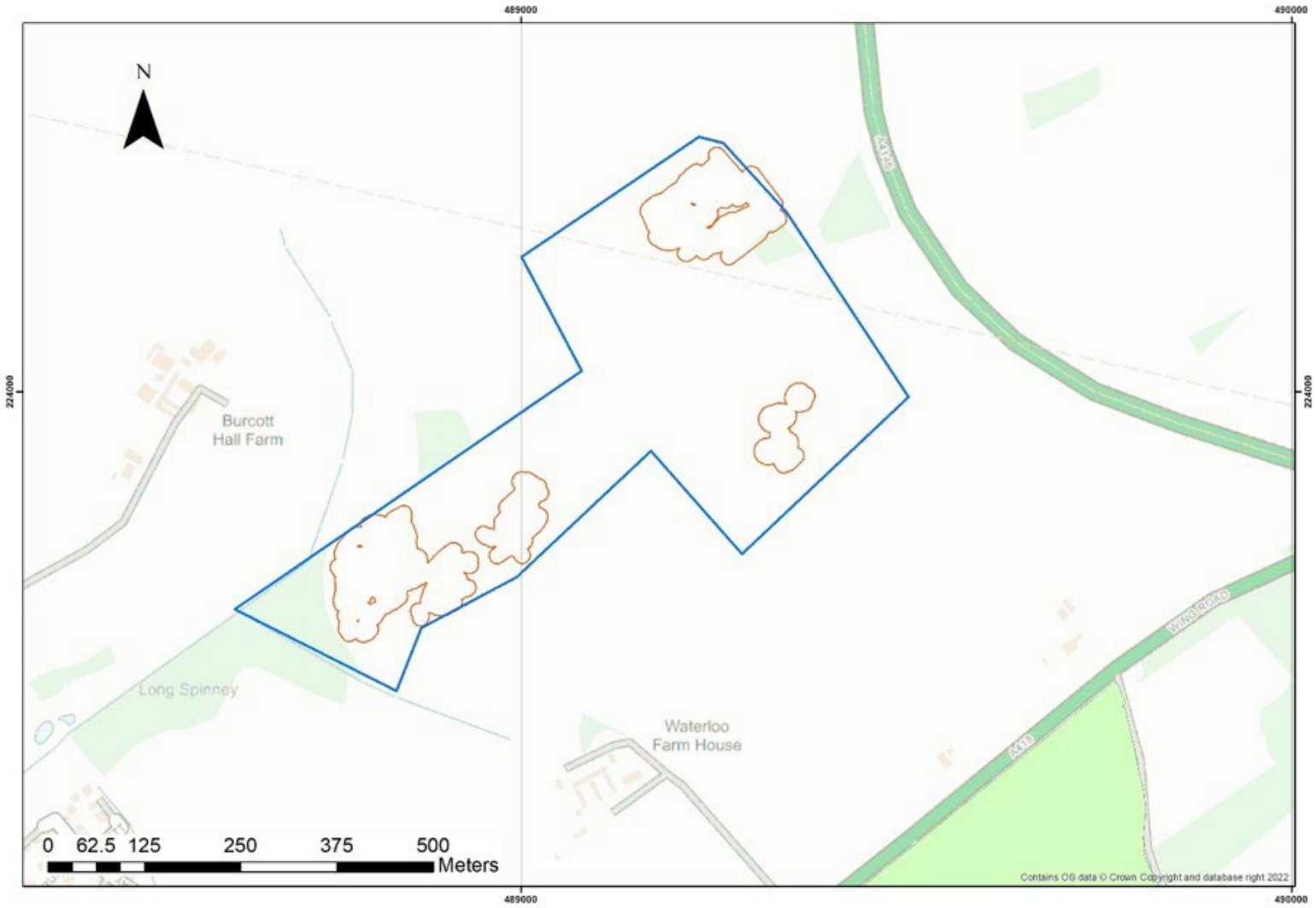
Fox Covert Solar Farm, Little Horwood Airfield, Adstock

- Archaeological work carried out as a condition of planning consent.
- Large site covering 46 hectares across six fields
- Geophysical survey of whole site followed by 4% trenching (342 trenches)
- An Iron-Age – Roman rural settlement including at least one roundhouse was discovered, which was excluded from the development area

Tree planting projects

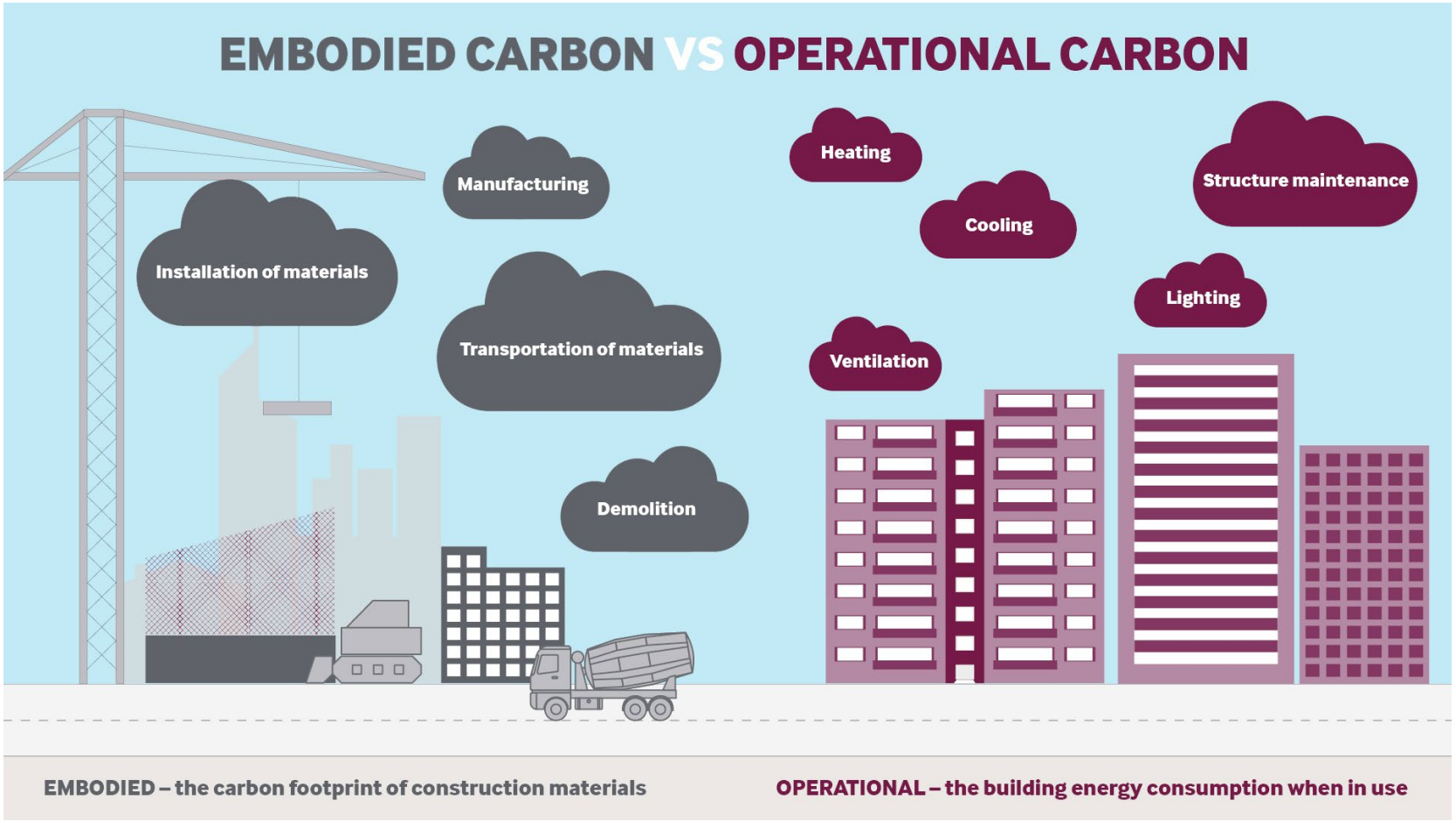
- Buckinghamshire Council target to plant 543k trees by 2025 – one for every resident at the time the target was set
- Projects vary in scale – can involve large blocks of woodland, or dispersed areas on large estates
- Often in rural areas, where archaeological potential is less well known
- Can impact on buried archaeological remains and historic landscapes
- Large areas of planting have been proposed on medieval ridge and furrow
- Often, a balanced judgement is needed due to other limitations

Wing solution



Built Heritage

Global 'boiling', increased rain fall and flooding



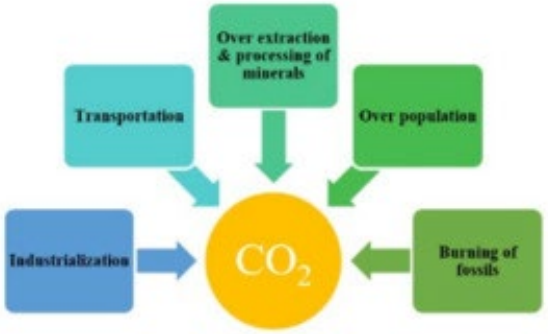
Whole Life Carbon
Recent Appeal decisions – M&S
EPC calculations – based on cavity wall assumptions

With existing heritage properties, when it comes to greenhouse gas (GHG) emissions, there is a question of whether the best way to reduce emissions is to retrofit or to demolish and rebuild. From a regulatory aspect, the focus is mainly on a building's operational emissions, through orientation, location and design[1]i.e., how it is used on a daily basis, rather than considering the lifecycle of a building and the embodied carbon within the building fabric. In a case of demolish and rebuild, by not including the embodied carbon of an existing building when calculating the GHG emissions of the project, it has been estimated that the lifetime emissions of that new build could be underestimated by up to one third[2]. This is demonstrated in the example of the proposal by M&S to demolish their flagship store on Oxford Street, which is a 94-year-old structure and would result in the demolishing of 3 existing buildings to allow for the construction of a new energy efficient store, part of a larger 10 story block. Following an investigation, it was highlighted in a report produced by SAVE Britain's Heritage that the demolition of the existing building for the new development would result in an additional 40 kilotonnes of embodied carbon within the building materials released[3]. Though the new building is projected to be operationally highly efficient and be "among the top 10% performing buildings in London"[4], this does not take into account the carbon that will add to the footprint of the new building, as the result of lost materials and disposal. This is further demonstrated in the paper, 'Considering Embodied Energy and Carbon in Heritage Buildings – A review[5]. The paper highlighted a Belgian heritage study, which demonstrated that the option of a retrofit package would be 57% better in lifecycle carbon emissions than a demolition/rebuild option. The latter requires a larger investment of embodied carbon in the present for a future of operational savings, which can have a negative impact, especially as energy sources decarbonise[6].

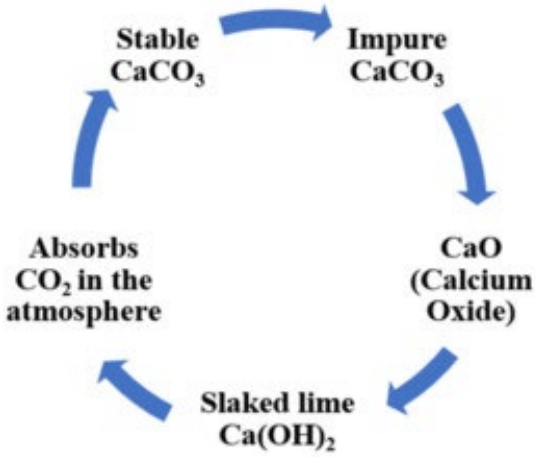
[1]Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework
[2]Historic England (2020) There's No Place Like Old Homes: Reduce and recycle to reduce carbon
[3]SAVE Britain's Heritage (2023) The Battle for M&S Oxford Street: Why this landmark case matters
[4]M&S (2022) M&S Position On Secretary Of State Decision To Call In Its Proposed Marble Arch Development - https://corporate.marksandspencer.com/media/press-releases/ms-position-secretary-state-decision-call-its-proposed-marble-arch-development
[5]: F Wise, A Moncaster, D Jones & E Dewberry (2019) Considering embodied energy and carbon in heritage buildings – a review. IOP Conf. Ser.: Earth and Environmental Science. 329 012002
[6]As above

Back to Basics

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." - Gro Harlem Brundtland



(a)



(b)

Lime is one of the most sustainable materials in existence today, it can be used over and over again without losing its integrity or quality. Lime mortars have proven themselves to be durable materials with great potential for longevity and lime absorbs CO2.

Listed and Traditionally Constructed Buildings - Useful guidance

Historic England
https://historicengland.org.uk/advice/technical-advice/retrofit-and-energy-efficiency-in-historic-buildings/
https://historicengland.org.uk/advice/technical-advice/retrofit-and-energy-efficiency-in-historic-buildings/modifying-historic-windows-as-part-of-retrofitting-energy-saving-measures/

LETI Climate Emergency Retrofit Guide
https://www.leti.uk/retrofit

Climate Emergency Conservation Area Toolkit
https://www.architectscan.org/conservation-area-toolkit-retrofit-homes

Sustainable and Traditional Buildings Alliance
https://stbauk.org/

Cambridge City Council, retrofitting your Home
https://www.cambridge.gov.uk/media/11676/retrofitting-your-home-report.pdf

Cosey Homes Oxfordshire
https://cosyhomesoxfordshire.org/homeowners/

Quick wins

•Maintain and repair – lead flashing, windows, ground levels etc.
•Clear and fix drains and gutters – damp walls are cold walls
•New or additional loft insulation
•Draught-proofing windows, doors, floorboards etc
•Secondary glazing
•Fitting insulated curtains or shutters
•Chimney balloons to eliminate chimney draughts
•Energy-efficient lighting
•Switching to a 100% renewable energy tariff.

Upgrades

•Overhauling windows without loss of important historic features
•Replace failing cement render with lime render, consider adding breathable insulation
•Boiler upgrade, Renewable energy options may need to consider fabric improvements, underfloor heating or oversized radiators

Victorian town house (Manchester) - Europe’s first Passivehaus Enerphit Plus:

- 60 KW hrs renewable energy
- 60m2 photovoltaic cells on roof
- Breathable insulation and ventilation
- Angled rear windows toward the sun
- Internal insulation to front elevation
- External insulation to side and rear

What can we do?

'Sustainability and Conservation go together like peanut butter and jam'

We will promote:

Retention of traditional building stock and use of local and sustainable materials

Understanding individual buildings / sites and their capacity for change

Brave decisions, innovation and well managed change

Getting the right experts involved with finding solutions

The need for better policies and guidance which address sustainability and consider impact on historic env eg. Good conservation, Householder guides, local policies