The role of sequestration in carbon reporting

How Hertfordshire is considering the Welsh LGA method to quantify sequestration on council-owned land

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

Sequestration and Carbon reporting

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

Legitimacy

What about additionality?

Making sure we're not greenwashing

Scale

Accuracy vs financial viability

What quantities of carbon are we talking about?

Consistency

Bringing others into the conversation

Alignment regionally and nationally

Why we are looking at sequestration now

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

LAs face persistent residual emissions even after pursuing mitigation efforts.

Sequestration is not first mitigation tool but can help refine operational carbon reporting.

No England-wide methodology →

LAs need a defensible, consistent, transparent approach.

Why green assets matter:

- Hertfordshire LAs collectively own / maintain:
  - Parks
  - Woodlands
  - Verges
  - Grasslands
  - Wetlands
- These assets **already sequester carbon annually**
- Until now – no shared way to quantify their contribution, building a more accurate reporting baseline…

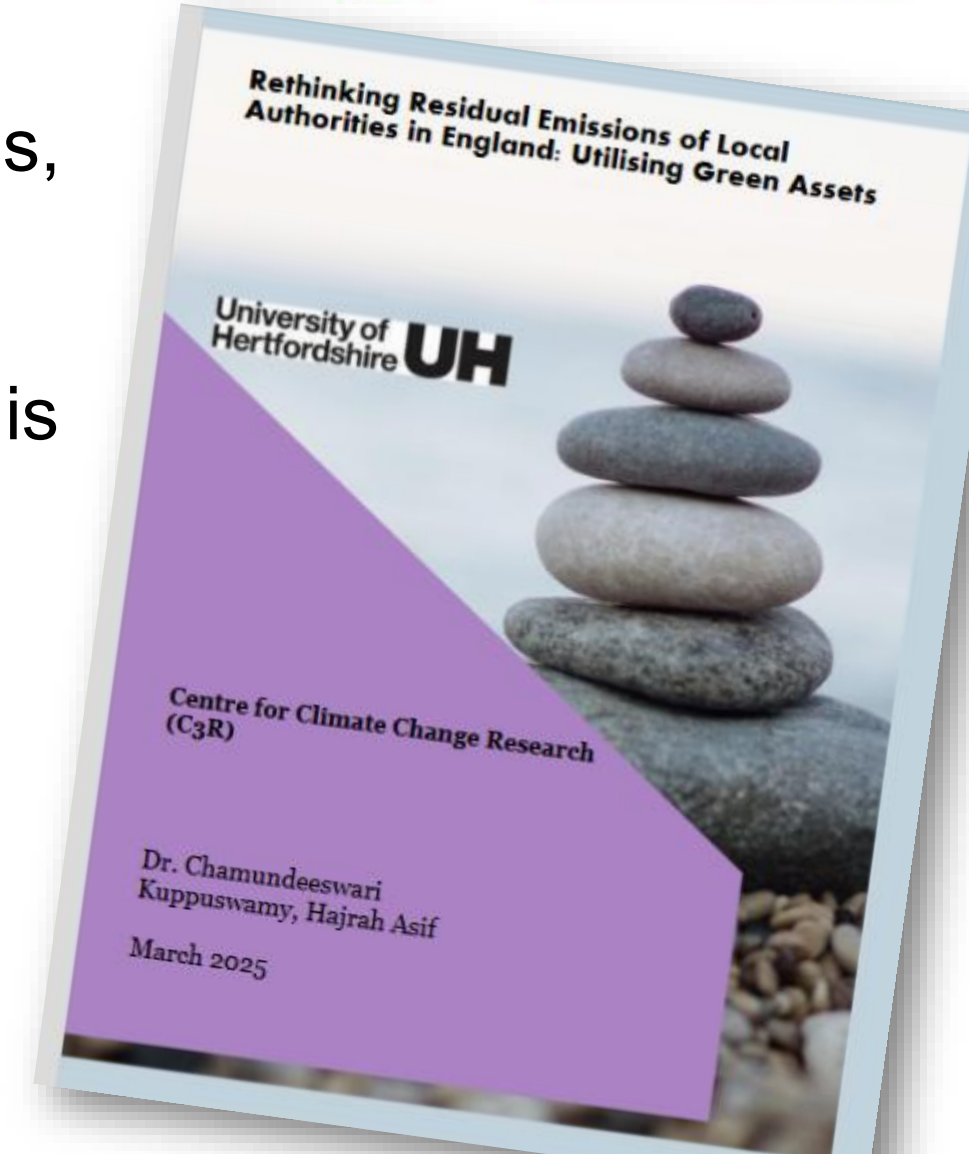
And what about additionality anyway?

The question of additionality

- Additionality applies to offset programmes, not reporting your own net emissions.
- LAs are not required to own parks or woodland → therefore the sequestration is not “baseline statutory”.
- If you report emissions from existing assets, you should also report removals from existing assets.

University of Hertfordshire UH

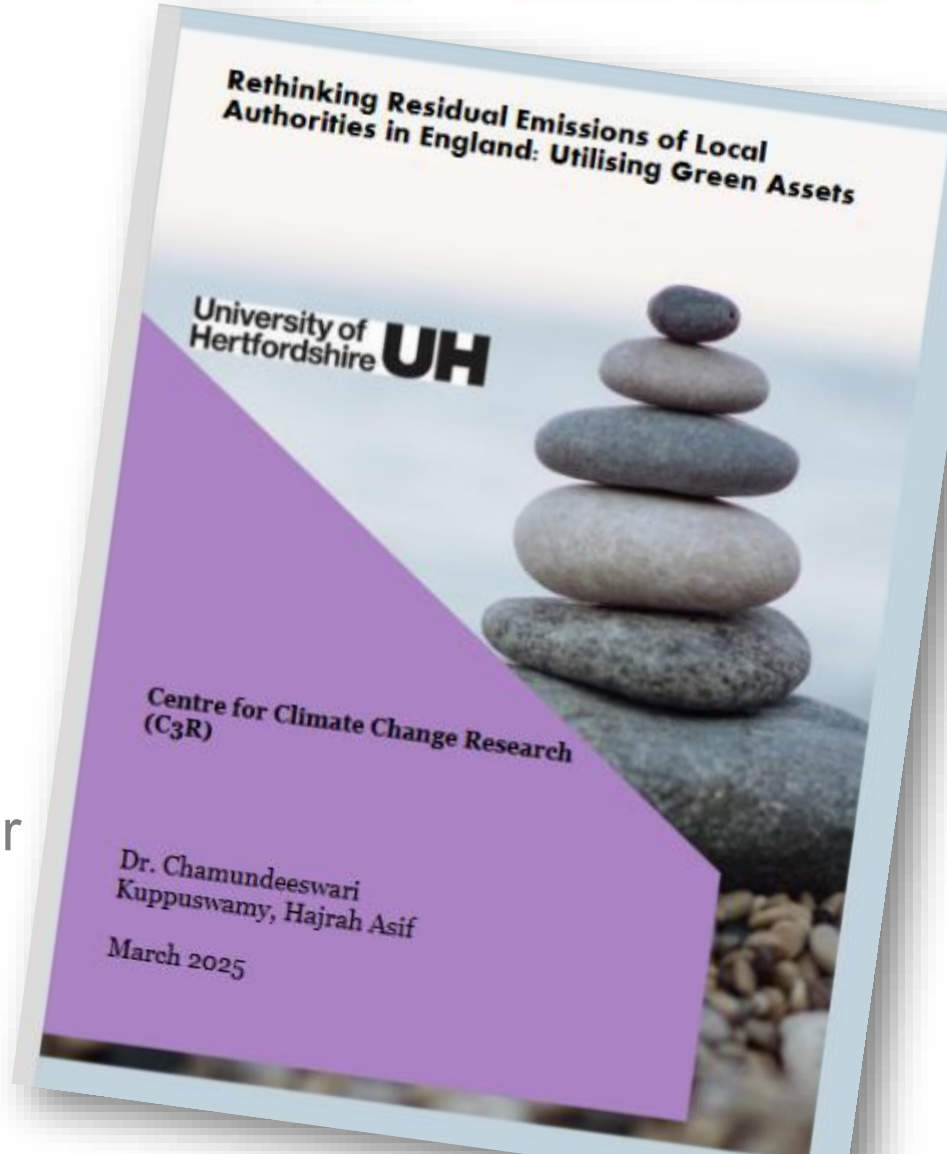
UH's Rethinking Residual Emissions of Local Authorities: 2025



Quantifying LA carbon benefits

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

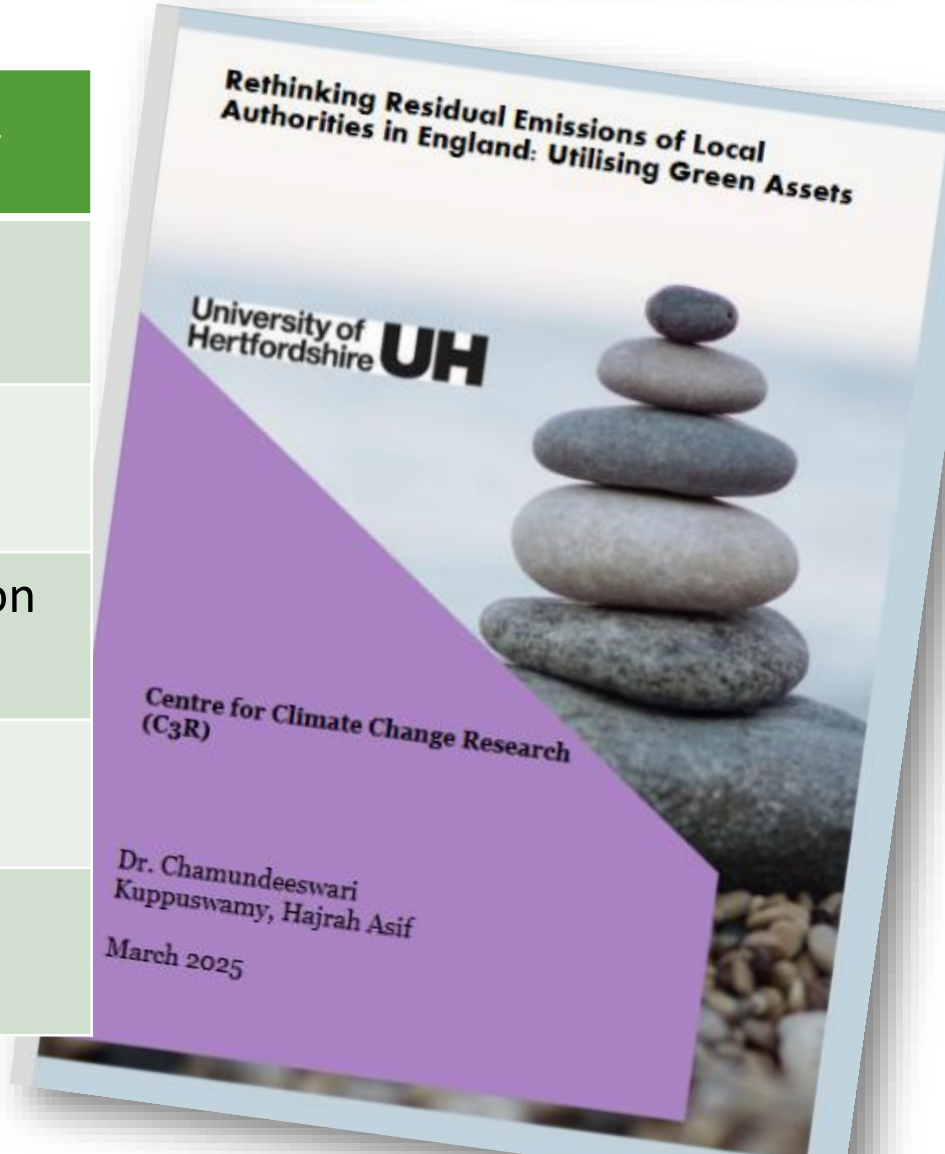
1. Managed trees, ancient woodland, soil, football pitches, grasslands, verges and wetlands (“Green assets”)
2. Domestic energy efficiency measures, funded by central government, enabled by LAs in private or social housing
3. Community energy efficiency or decarbonisation measures enabled by LAs (e.g., in community buildings)
4. Enabling privately funded PV measures (e.g., Solar Together project)
5. Enabling behaviour change projects (e.g. EV chargepoint installation to help uptake)



Quantifying LA carbon benefits

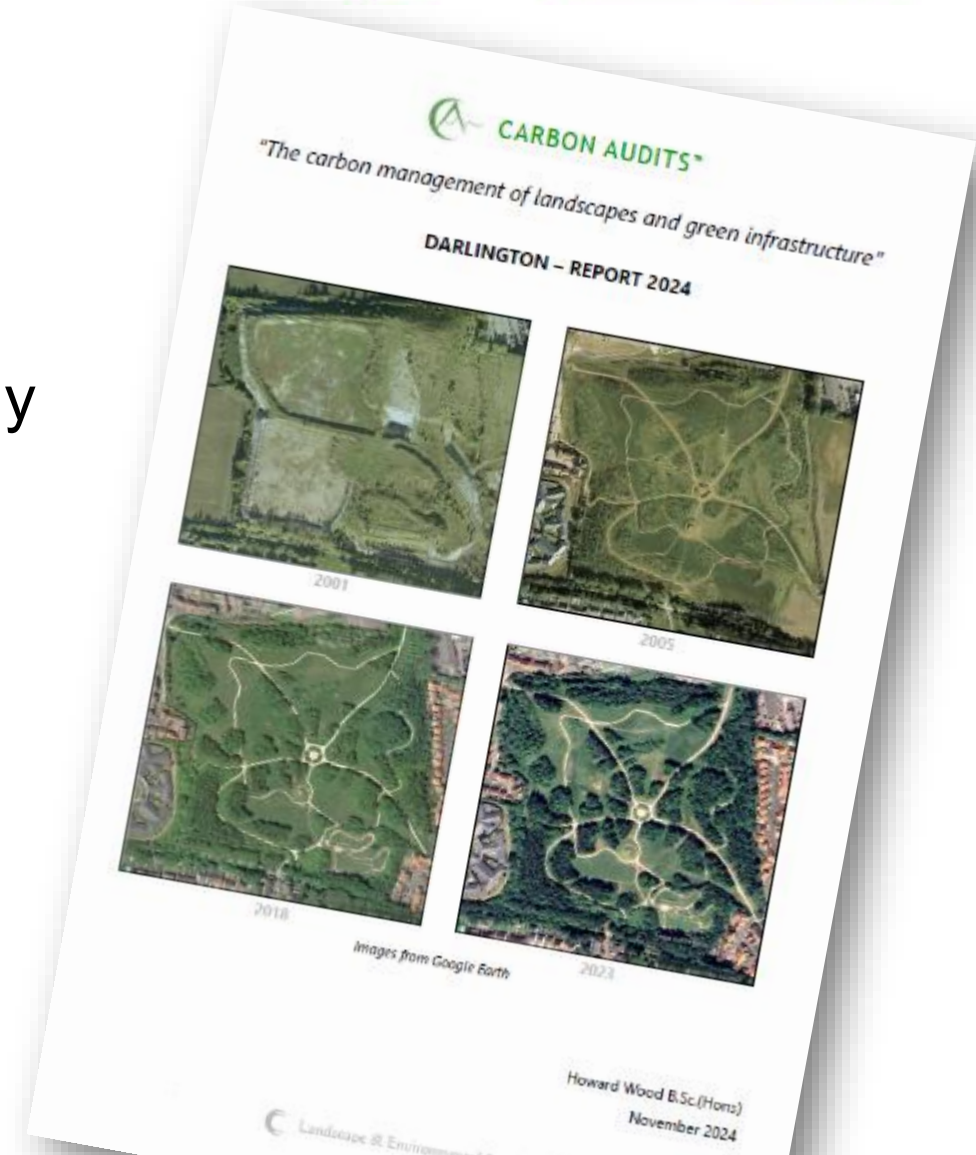
HCCSP
Hertfordshire Climate Change and Sustainability Partnership

Green Asset	Legal Duty	Additionality
Managed Trees	H&S obligations	Tree planting and maintenance
Ancient woodlands	Some protection via planning law	Entirely additional
Soil	Address contamination	Proactive soil carbon management
Wetlands	Some protection if SSSI	Entirely additional
Grass verges and football pitches	No legal obligation	Entirely additional



The challenge: inconsistent, costly or incomplete

- Detailed studies by consultancies (Darlington)
  - accurate but high cost and longterm
  - Inconsistent, potentially opaque methodology
- i-Tree
  - good for street trees but not whole-estate
- Woodland Carbon Code
  - robust but limited to woodland



Carbon counting in Darlington: LGA Case study

WLGA: GHG Emissions and Carbon Sequestration Tool

- Land-based emissions reported annually since 2019
  - Forest, cropland, grassland, wetland, settlements and ‘other’
  - Carbon Stock Exchange Factors
- 2022 tool developed by WLGA / COSTAIN
  - Habitat detail
  - Parcel-level granularity

Land & Carbon Sequestration and Storage WLGA: 2022

WLGA: GHG Emissions and Carbon Sequestration Tool

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

- National endorsed and peer reviewed
- Transparent, open-source, replicable
- Designed for mixed landholding patterns managed by LAs
- Cost-effective: prudent but credible
- Already aligned with LULUCF and NAEI datasets

WLGA: What does it do?

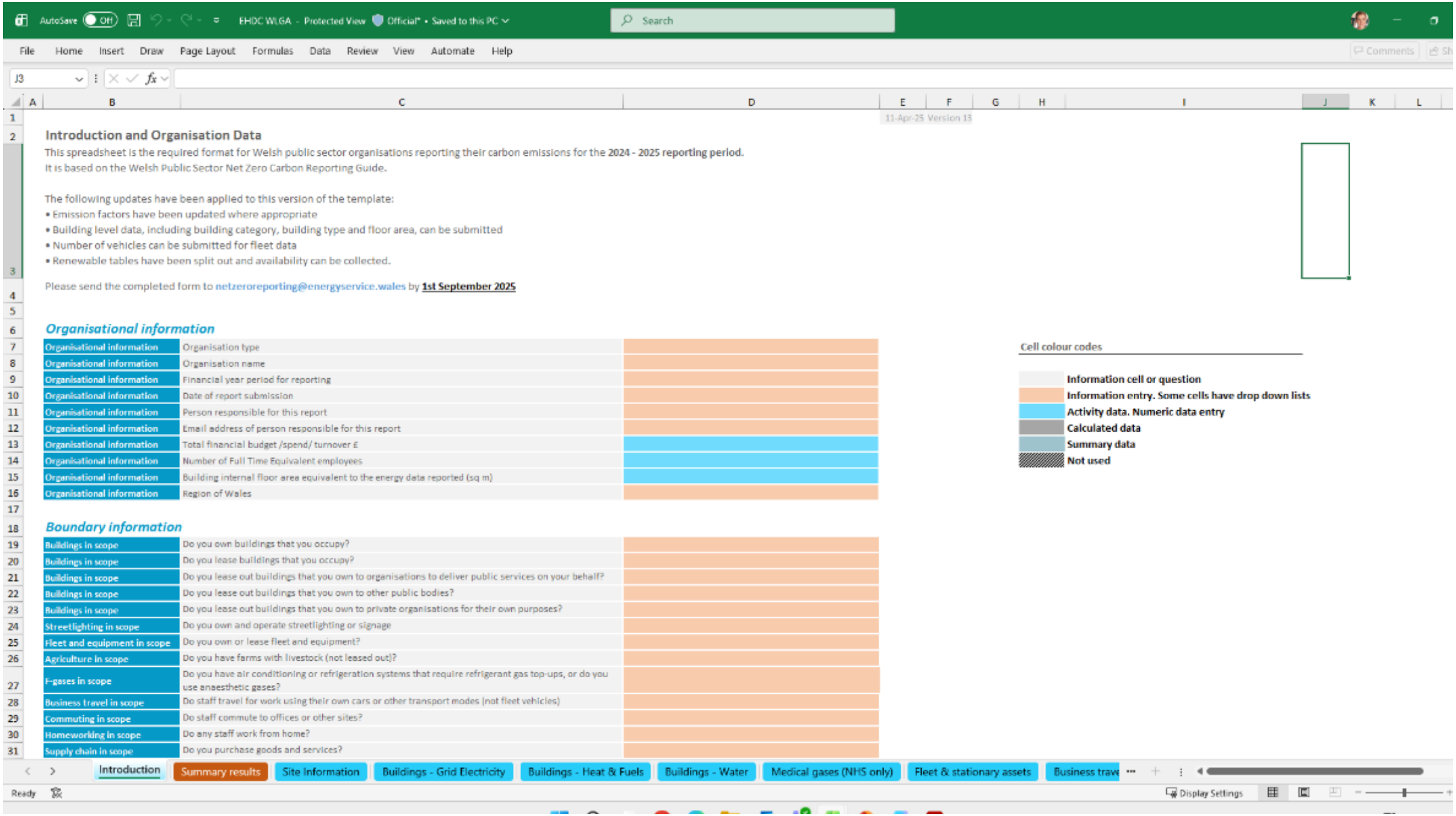
HCCSP
Hertfordshire Climate Change and Sustainability Partnership

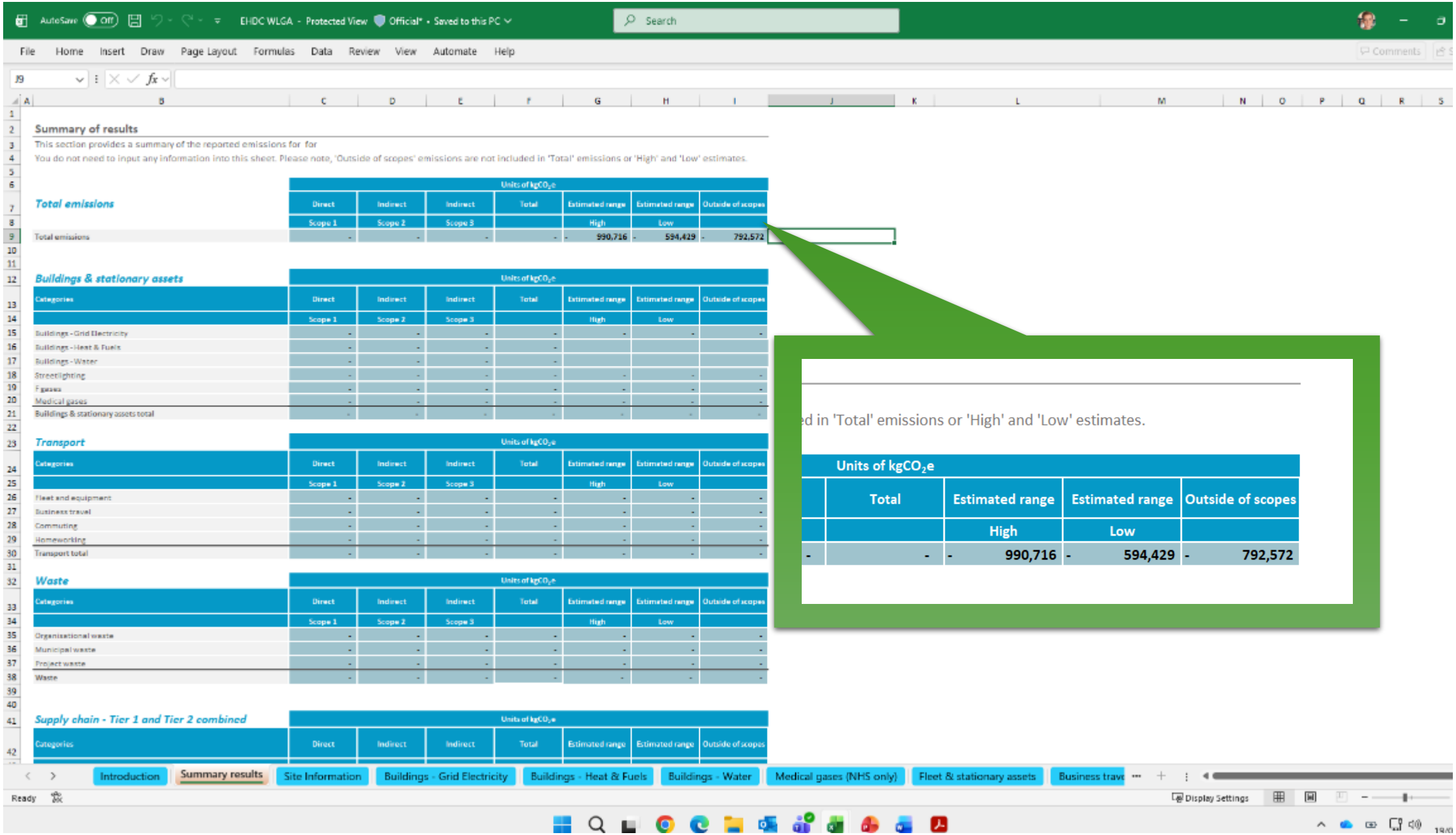
Habitat polygon via GIS mapping

Classify land into LULUCF categories

Build on sequestration factors from NAEI

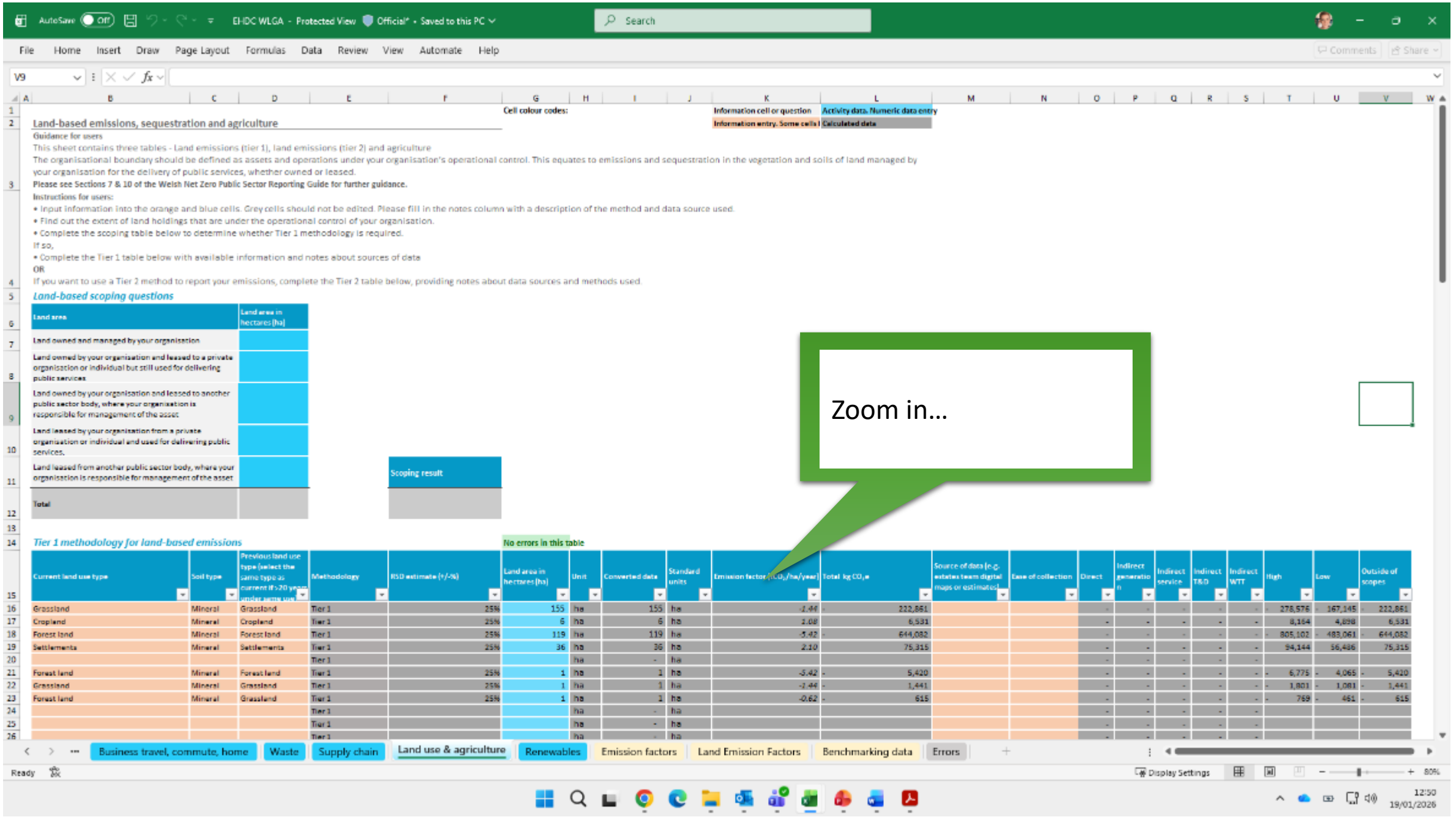
Single annual sequestration figure


AutoSave OFF
FHDC WLGA - Protected View Official* • Saved to this PC
Search
File Home Insert Draw Page Layout Formulas Data Review View Automate Help
J3
11-Apr-25 Version 13
Introduction and Organisation Data
This spreadsheet is the required format for Welsh public sector organisations reporting their carbon emissions for the 2024 - 2025 reporting period.
It is based on the Welsh Public Sector Net Zero Carbon Reporting Guide.
The following updates have been applied to this version of the template:
• Emission factors have been updated where appropriate
• Building level data, including building category, building type and floor area, can be submitted
• Number of vehicles can be submitted for fleet data
• Renewable tables have been split out and availability can be collected.
Please send the completed form to netzeroreporting@energyservice.wales by 1st September 2025
Organisational information
Organisational information | Organisation type
Organisational information | Organisation name
Organisational information | Financial year period for reporting
Organisational information | Date of report submission
Organisational information | Person responsible for this report
Organisational information | Email address of person responsible for this report
Organisational information | Total financial budget /spend/ turnover £
Organisational information | Number of Full Time Equivalent employees
Organisational information | Building internal floor area equivalent to the energy data reported (sq m)
Organisational information | Region of Wales
Boundary information
Buildings in scope | Do you own buildings that you occupy?
Buildings in scope | Do you lease buildings that you occupy?
Buildings in scope | Do you lease out buildings that you own to organisations to deliver public services on your behalf?
Buildings in scope | Do you lease out buildings that you own to other public bodies?
Buildings in scope | Do you lease out buildings that you own to private organisations for their own purposes?
Streetlighting in scope | Do you own and operate streetlighting or signage
Fleet and equipment in scope | Do you own or lease fleet and equipment?
Agriculture in scope | Do you have farms with livestock (not leased out)?
F-gases in scope | Do you have air conditioning or refrigeration systems that require refrigerant gas top-ups, or do you use anaesthetic gases?
Business travel in scope | Do staff travel for work using their own cars or other transport modes (not fleet vehicles)
Commuting in scope | Do staff commute to offices or other sites?
Homeworking in scope | Do any staff work from home?
Supply chain in scope | Do you purchase goods and services?
Cell colour codes
Information cell or question
Information entry. Some cells have drop down lists
Activity data. Numeric data entry
Calculated data
Summary data
Not used
Introduction
Summary results
Site Information
Buildings - Grid Electricity
Buildings - Heat & Fuels
Buildings - Water
Medical gases (NHS only)
Fleet & stationary assets
Business trave
Ready
Display Settings



ed in 'Total' emissions or 'High' and 'Low' estimates.

	Units of $kgCO_2e$			
	Total	Estimated range	Estimated range	Outside of scopes
		High	Low	
-	-	- 990,716	- 594,429	- 792,572


AutoSave Off
EHDC WLGA - Protected View Official* • Saved to this PC
Search
File Home Insert Draw Page Layout Formulas Data Review View Automate Help
Comments Share
V9
Cell colour codes:
Information cell or question
Activity data. Numeric data entry
Information entry. Some cells
Calculated data
Land-based emissions, sequestration and agriculture
Guidance for users
This sheet contains three tables - Land emissions (tier 1), land emissions (tier 2) and agriculture
The organisational boundary should be defined as assets and operations under your organisation's operational control. This equates to emissions and sequestration in the vegetation and soils of land managed by your organisation for the delivery of public services, whether owned or leased.
Please see Sections 7 & 10 of the Welsh Net Zero Public Sector Reporting Guide for further guidance.
Instructions for users:
• Input information into the orange and blue cells. Grey cells should not be edited. Please fill in the notes column with a description of the method and data source used.
• Find out the extent of land holdings that are under the operational control of your organisation.
• Complete the scoping table below to determine whether Tier 1 methodology is required.
If so,
• Complete the Tier 1 table below with available information and notes about sources of data
OR
If you want to use a Tier 2 method to report your emissions, complete the Tier 2 table below, providing notes about data sources and methods used.
Land-based scoping questions
Land area
Land area in hectares (ha)
Land owned and managed by your organisation
Land owned by your organisation and leased to a private organisation or individual but still used for delivering public services
Land owned by your organisation and leased to another public sector body, where your organisation is responsible for management of the asset
Land leased by your organisation from a private organisation or individual and used for delivering public services.
Land leased from another public sector body, where your organisation is responsible for management of the asset
Total
Scoping result
Zoom in...
Tier 1 methodology for land-based emissions
No errors in this table
Current land use type
Soil type
Previous land use type (select the same type as current if >20 years under same use)
Methodology
RSD estimate (+/-%)
Land area in hectares (ha)
Unit
Converted data
Standard units
Emission factor (tCO2/ha/year)
Total kg CO2e
Source of data (e.g. estates team digital maps or estimates)
Ease of collection
Direct
Indirect generation
Indirect service
Indirect T&D
Indirect WTT
High
Low
Outside of scopes
Grassland Mineral Grassland Tier 1 25% 155 ha 155 ha -2.44 - 222,861 278,576 167,145 222,861
Cropland Mineral Cropland Tier 1 25% 6 ha 1.08 6,531 8,164 4,898 6,531
Forest land Mineral Forest land Tier 1 25% 119 ha -5.42 - 644,082 805,102 483,061 644,082
Settlements Mineral Settlements Tier 1 25% 36 ha 2.10 75,315 94,144 56,486 75,315
Tier 1 ha ha
Forest land Mineral Forest land Tier 1 25% 1 ha -5.42 - 5,420 6,775 4,065 5,420
Grassland Mineral Grassland Tier 1 25% 1 ha -2.44 - 1,441 1,801 1,081 1,441
Forest land Mineral Grassland Tier 1 25% 1 ha -0.62 - 615 769 461 615
Tier 1 ha ha
Tier 1 ha ha
Tier 1 ha ha
Business travel, commute, home
Waste
Supply chain
Land use & agriculture
Renewables
Emission factors
Land Emission Factors
Benchmarking data
Errors
Ready
Display Settings
80%
12:50
19/01/2026

Tier 1 methodology for land-based emissions

No errors in this table

Current land use type	Soil type	Previous land use type (select the same type as current if >20 years under same use)	Methodology	RSD estimate (+/-%)	Land area in hectares (ha)	Unit	Converted data	Standard units	Emission factor (tCO_2/ha/year)	Total kg CO_2e	Source of estates te maps or e
Grassland	Mineral	Grassland	Tier 1	25%	155	ha	155	ha	-1.44	- 222,861	
Cropland	Mineral	Cropland	Tier 1	25%	6	ha	6	ha	1.08	6,531	
Forest land	Mineral	Forest land	Tier 1	25%	119	ha	119	ha	-5.42	- 644,082	
Settlements	Mineral	Settlements	Tier 1	25%	36	ha	36	ha	2.10	75,315	
			Tier 1			ha	-	ha			
Forest land	Mineral	Forest land	Tier 1	25%	1	ha	1	ha	-5.42	- 5,420	
Grassland	Mineral	Grassland	Tier 1	25%	1	ha	1	ha	-1.44	- 1,441	
Forest land	Mineral	Grassland	Tier 1	25%	1	ha	1	ha	-0.62	- 615	
			Tier 1			ha	-	ha			
			Tier 1			ha	-	ha			
			Tier 1			ha	-	ha			

Business travel, commute, home | Waste | Supply chain | Land use & agriculture | Renewables | Emission factors | Land Emission Factors | Benchmarking data | Errors

Ready

ource of data (e.g. estates team digital naps or estimates)	Ease of collection	Direct	Indirect generation	Indirect service	Indirect T&D	Indirect WTT	High	Low	Outside of scopes
		-	-	-	-	-	- 278,576	- 167,145	- 222,861
		-	-	-	-	-	8,164	4,898	6,531
		-	-	-	-	-	- 805,102	- 483,061	- 644,082
		-	-	-	-	-	94,144	56,486	75,315
		-	-	-	-	-			
		-	-	-	-	-	- 6,775	- 4,065	- 5,420
		-	-	-	-	-	- 1,801	- 1,081	- 1,441
		-	-	-	-	-	- 769	- 461	- 615
		-	-	-	-	-			
		-	-	-	-	-			
		-	-	-	-	-			

rrors

Land use emission factors (kgCO2e/ha)

			Previous landuse	Previous landuse	Previous landuse	Previous landuse	Previous landuse	Previous landuse
	Current land use	Soil type	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land
Y	Forest land	Mineral	-5.42	-0.95	-0.62	*No emission factor available*	-0.65	*No emission factor available*
Y	Forest land	Organic	-7.27	0.32	0.82	*No emission factor available*	0.71	*No emission factor available*
Y	Cropland	Mineral	11.04	1.08	4.52	*No emission factor available*	-3.85	*No emission factor available*
Y	Cropland	Organic	*No emission factor available*	18.34	-0.25	*No emission factor available*	-0.27	*No emission factor available*
Y	Grassland	Mineral	11.91	-1.89	-1.44	*No emission factor available*	-6.72	*No emission factor available*
Y	Grassland	Organic	6.96	0.28	0.02	*No emission factor available*	-0.15	*No emission factor available*
Y	Wetlands	Mineral	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Wetlands	Organic	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Settlements	Mineral	39.40	7.48	13.50	*No emission factor available*	2.10	*No emission factor available*
Y	Settlements	Organic	15.94	0.43	0.12	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Other land	Mineral	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Other land	Organic	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*

The Hertfordshire adaptation

- Integrating with HCC GIS capacity
- Mapping of LA ownership / management (double counting)
- Agreed framework for:
  - What's in scope (parks, woodlands, verges…)
  - What's out of scope (leased farmland, privately managed land…)
- Requirement for prudent assumptions and transparent reporting
- Data useable for:
  - Decarbonisation plans
  - Land-use decisions
  - Business cases
- Less useful for gradual quality improvements

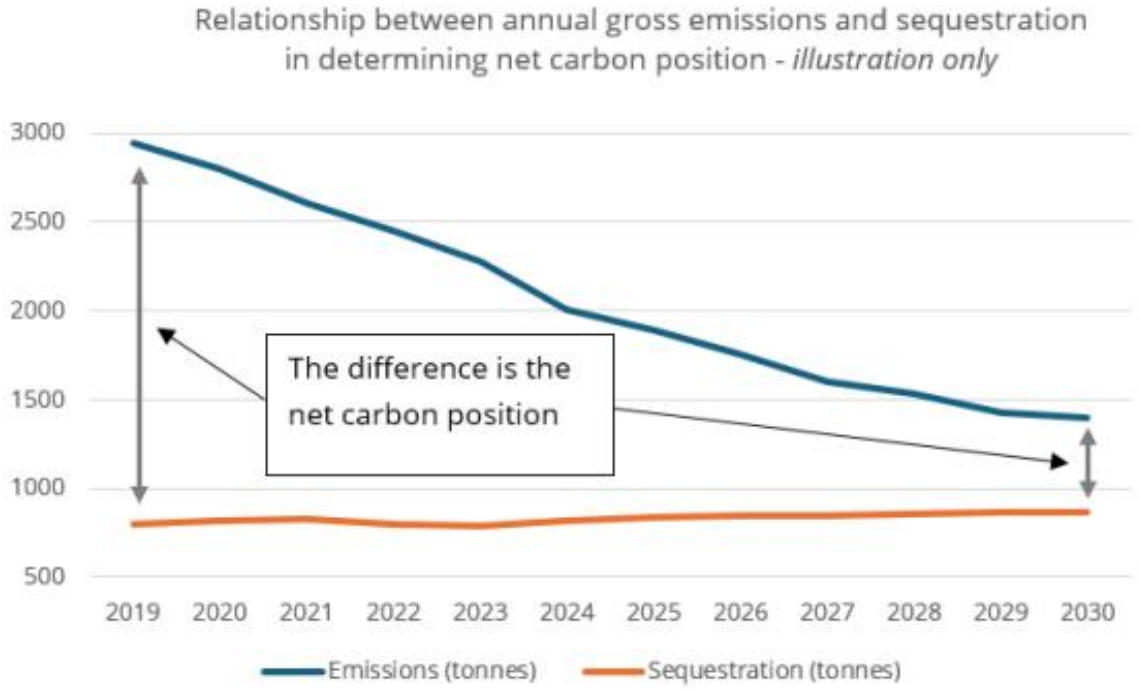
Using sequestration in practice

- Refining operational carbon accounting
- Understanding the true net effect of LA landholdings
- Informing land-use decisions & green asset investment
- Articulating value of ‘additional’ greening budgets
- Supporting long-term net-zero planning

But not:

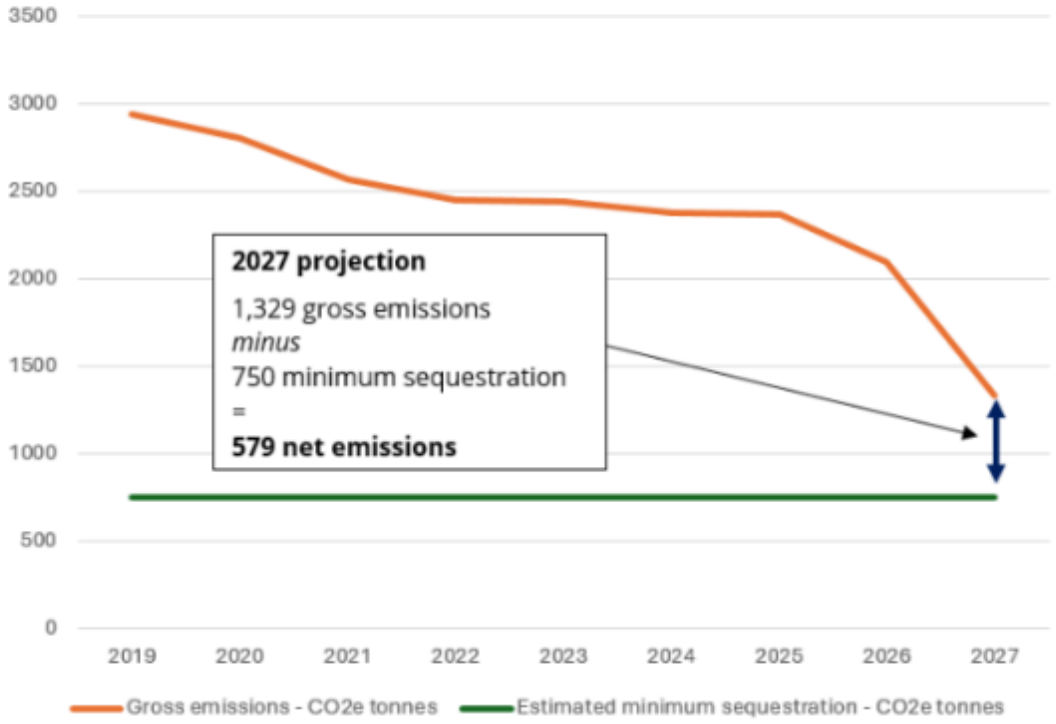
- To justify higher emissions
- As a replacement for mitigation
- As carbon credits / financial offsetting
- To claim future sequestration today

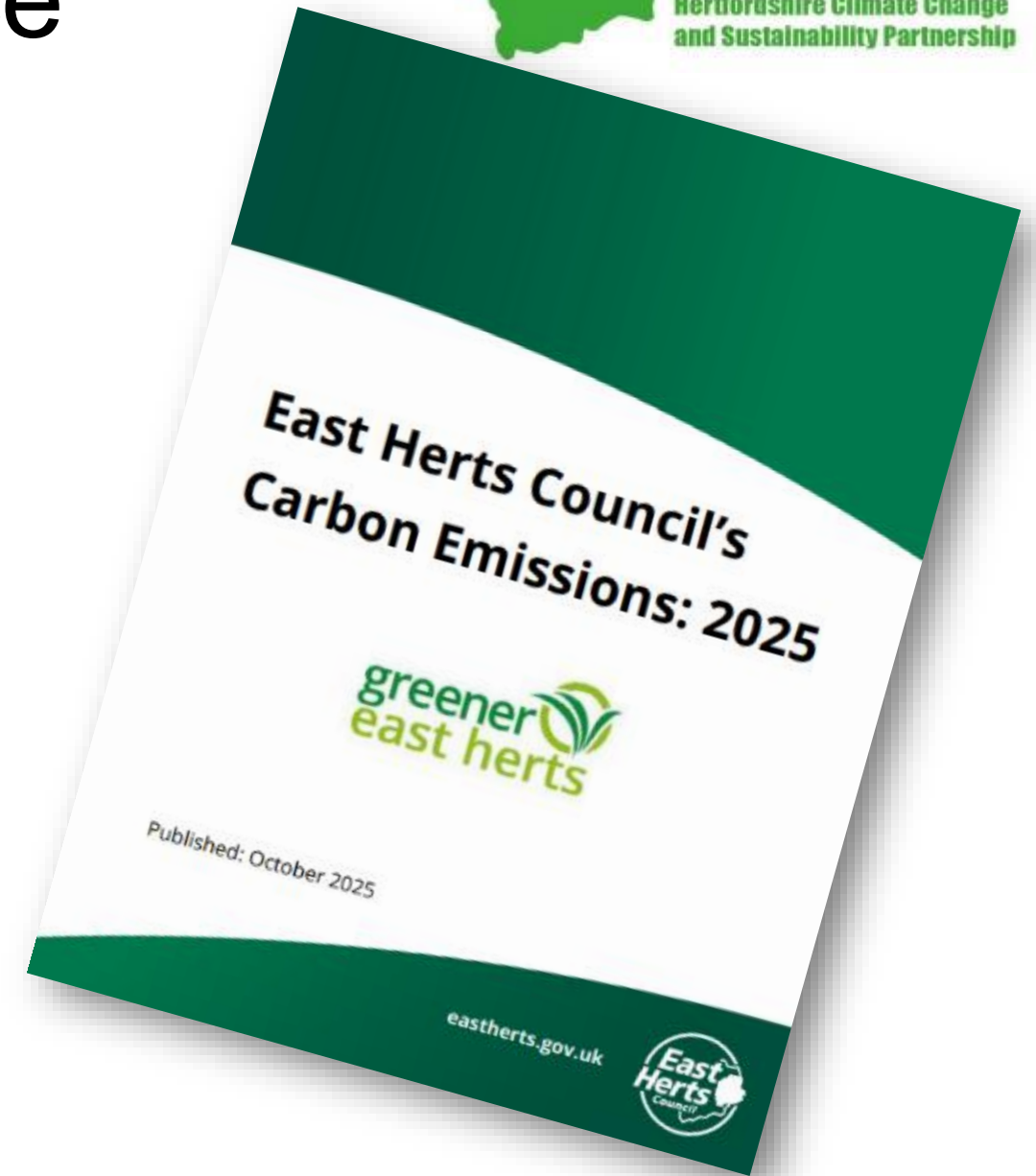
Figure 1: Illustration of how an organisation’s offsetting requirement can be determined – *illustrative figures only*



Sequestration in practice

Figure 2: East Herts Council's carbon emissions
actual to 2025, projected in 2026 and 2027 based on interventions currently in progress





East Herts Council's Carbon Emissions: 2025

Governance & credibility

HCCSP
Hertfordshire Climate Change and Sustainability Partnership

- ✓Prudent (don’t overstate)
- ✓Evidence-based
- ✓Transparent
- ✓Avoiding double-counting
- ✓Using government-endorsed factors
- ✓Aligned with Welsh method
- ✓Consistent (cross region / nation)

Land use emission factors (kgCO2e/ha)

			Previous landuse	Previous landuse	Previous landuse	Previous landuse	Previous landuse	Previous landuse
	Current land use	Soil type	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land
Y	Forest land	Mineral	-5.42	-0.95	-0.62	*No emission factor available*	-0.65	*No emission factor available*
Y	Forest land	Organic	-7.27	0.32	0.82	*No emission factor available*	0.71	*No emission factor available*
Y	Cropland	Mineral	11.04	1.08	4.52	*No emission factor available*	-3.85	*No emission factor available*
Y	Cropland	Organic	*No emission factor available*	18.34	-0.25	*No emission factor available*	-0.27	*No emission factor available*
Y	Grassland	Mineral	11.91	-1.89	-1.44	*No emission factor available*	-6.72	*No emission factor available*
Y	Grassland	Organic	6.96	0.28	0.02	*No emission factor available*	-0.15	*No emission factor available*
Y	Wetlands	Mineral	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Wetlands	Organic	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Settlements	Mineral	39.40	7.48	13.50	*No emission factor available*	2.10	*No emission factor available*
Y	Settlements	Organic	15.94	0.43	0.12	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Other land	Mineral	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*
Y	Other land	Organic	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*	*No emission factor available*

National Atmospheric Emissions Inventory

Greenhouse Gas Emissions Data

Publication Year	Title	Report and Data	Next Publication Date
2025	UK Emissions Data Selector	UK Emissions Data Selector	2026
2025	Emission Factor Selector	Emission Factor Selector	2026
2025	UK Greenhouse Gas Inventory: 1990 to 2023 (also known as National Inventory Document - NID)	UK Greenhouse Gas Inventory: 1990 to 2023	April 2026
2025	UK Greenhouse Gas Pivot Table - by Source	UK Greenhouse Gas Pivot Table 2025 - by Source	2026
2025	UK Greenhouse Gas Pivot Table - by End User	UK Greenhouse Gas Pivot Table 2025 - by End User	2026
2025	UK Greenhouse Gas Inventory: 1990-2023 - Machine Readable CSV Files	UK Greenhouse Gas Inventory: 1990-2023 - Machine Readable CSV Files	2026
2025	Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2023	Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2023	2026
2025	Emissions from Point Sources: 2005-2023	Emissions from Point Sources	Summer 2026

Partners

UK Government

Llywodraeth Cymru
Welsh Government

The Scottish Government
Riaghaltas na h-Alba

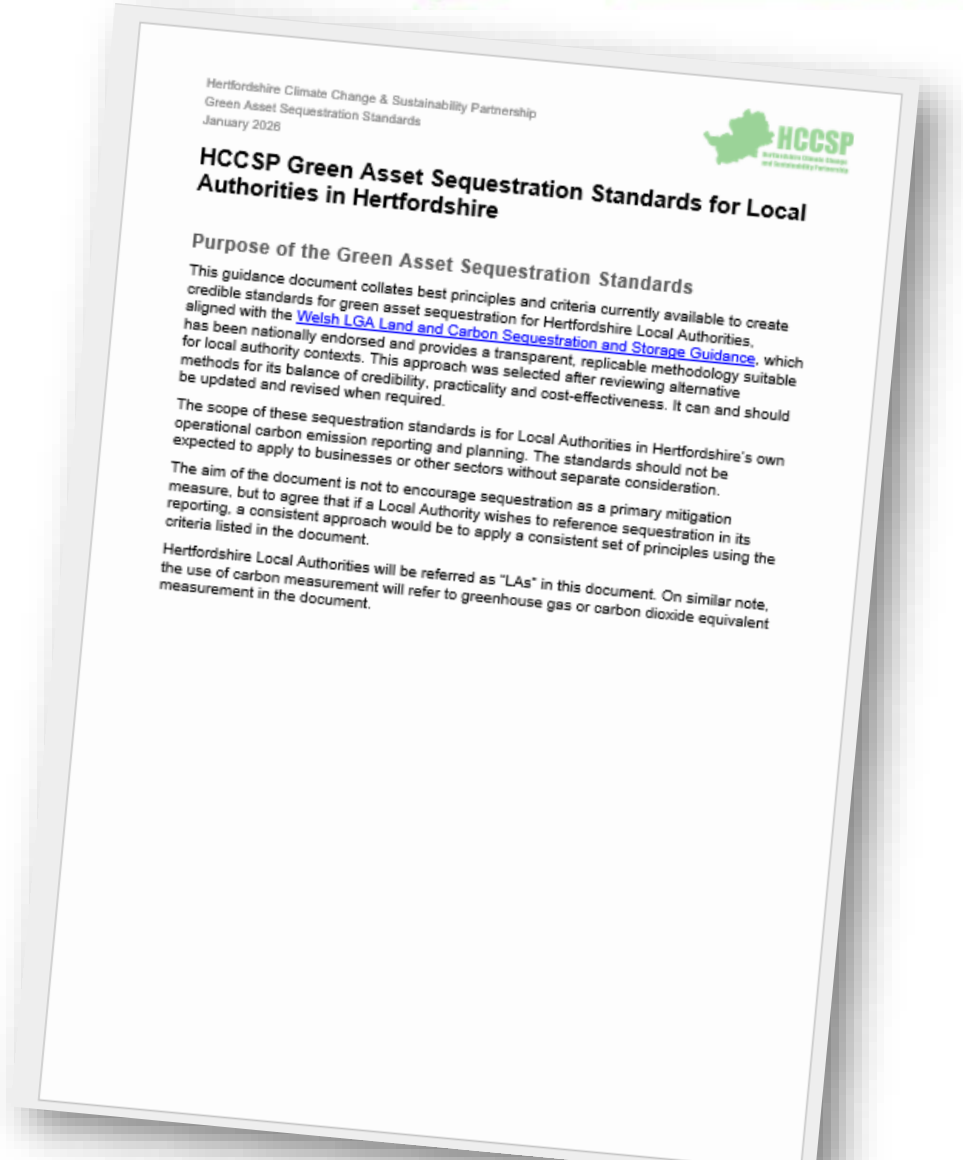
Department of Agriculture, Environment and Rural Affairs
An Roinn Talmhaíochta, Comhshaoil agus Gnóthaí Tuaithe
Department o' Fairmin, Environment an' Kintra Matthers

About the methodology: What happens next

- Important note:
  - Sequestration values currently used by Welsh LGA inherited from previous contractor
  - Audit trail for original NAEI derivation being re-established
  - Welsh Government, DataMapWales and Net Zero Reporting team are actively reviewing the methodology
  - Updated factors are expected shortly.
- EHDC local analysis and Hertfordshire adoption will shortly follow.

Taking this forward…

- Confirm source data with Wales
- Finalise Sequestration Standard Framework
- Country-wide knowledge share for feedback and critical friend
- Adoption by Hertfordshire LAs as part of annual reporting
- GIS team progress calculations
- Support English LGA to incorporate in GHG accounting tool



Hertfordshire Climate Change & Sustainability Partnership
Green Asset Sequestration Standards
January 2026

HCCSP Green Asset Sequestration Standards for Local Authorities in Hertfordshire

Purpose of the Green Asset Sequestration Standards

This guidance document collates best principles and criteria currently available to create credible standards for green asset sequestration for Hertfordshire Local Authorities, aligned with the Welsh LGA Land and Carbon Sequestration and Storage Guidance, which has been nationally endorsed and provides a transparent, replicable methodology suitable for local authority contexts. This approach was selected after reviewing alternative methods for its balance of credibility, practicality and cost-effectiveness. It can and should be updated and revised when required.

The scope of these sequestration standards is for Local Authorities in Hertfordshire's own operational carbon emission reporting and planning. The standards should not be expected to apply to businesses or other sectors without separate consideration.

The aim of the document is not to encourage sequestration as a primary mitigation measure, but to agree that if a Local Authority wishes to reference sequestration in its reporting, a consistent approach would be to apply a consistent set of principles using the criteria listed in the document.

Hertfordshire Local Authorities will be referred as "LAs" in this document. On similar note, the use of carbon measurement will refer to greenhouse gas or carbon dioxide equivalent measurement in the document.

Helen Burridge

HCCSP Manager

helen.burridge@eastherts.gov.uk

HCCSP
Hertfordshire Climate Change and Sustainability Partnership