Footprinting healthcare emissions – navigating uncertainty

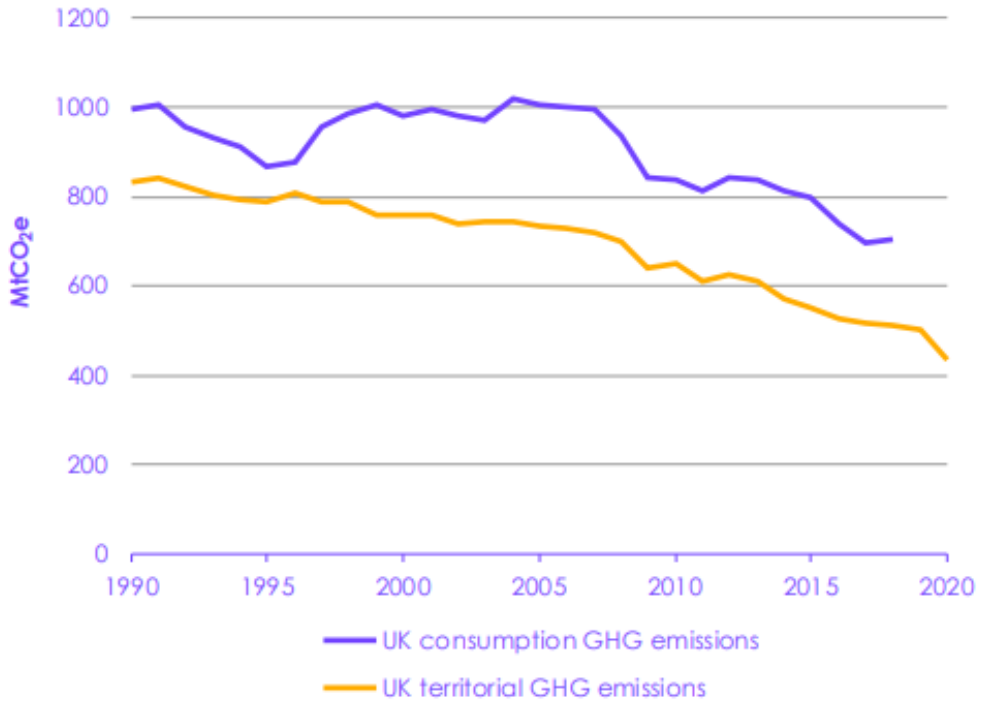
Tom Andrew

General

- Please do not share slides outside of this meeting
- Use chat and raise hands during the presentation – happy to take questions as we go
- Plenty of time for Q&A and discussion at the end

Background: UK emissions

Figure 2.10 Changes in UK consumption and territorial emissions since 1990



Roughly:

1 kgCO2e = a few miles in a car

1 tCO2e = annual household electricity

10tCO2e = UK citizen's carbon footprint

1 ktCO2e = Three full return flights to NY

100 ktCO2e = roughly one NHS trust footprint

1 MtCO2e = 250,000 homes' electricity and gas

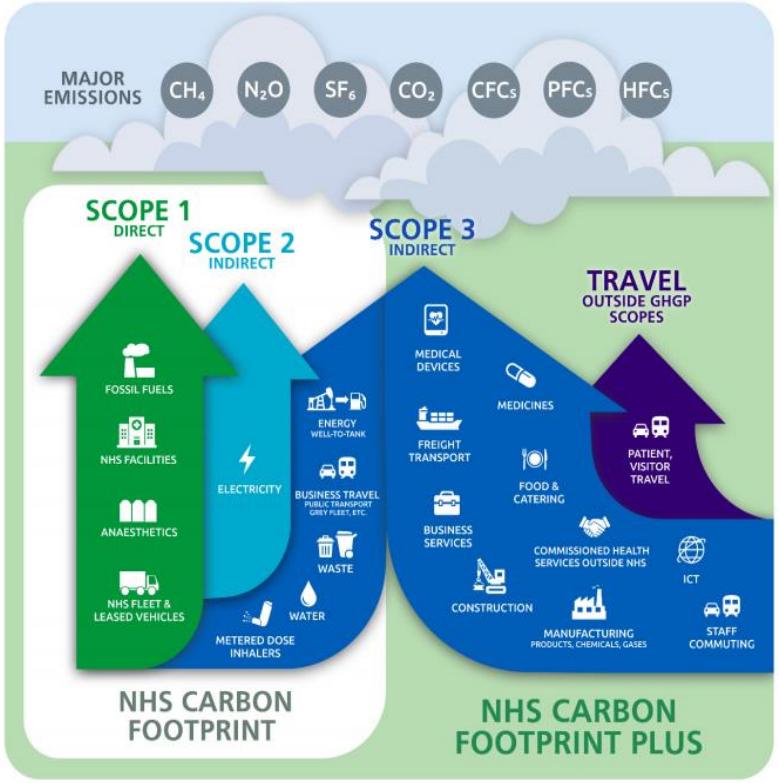
25 MtCO2e = NHS emissions

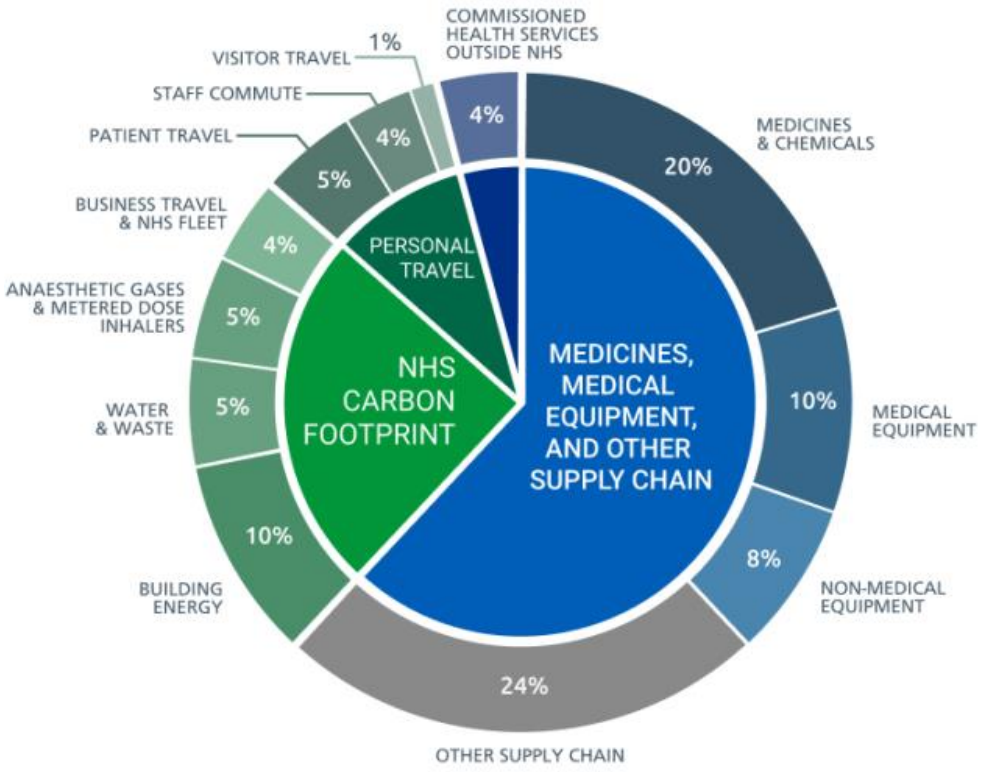
700 MtCO2e = UK footprint

Social carbon value is £100-300 per tCO2e (BEIS guidance)

Background: defining scopes

Scope 1	Scope 2	Scope 3	Out of scope (but relevant)
Fuel combustion Own vehicles Fugitive emissions (leaks) **Anaesthetic gases**	Purchased electricity, heat and steam	Purchases, business travel, employee commuting, waste, sold products, up- and down-stream energy transportation, investments, leased assets and franchises, **inhalers**	Waste disposal emissions (not landfill), **patient and visitor travel**





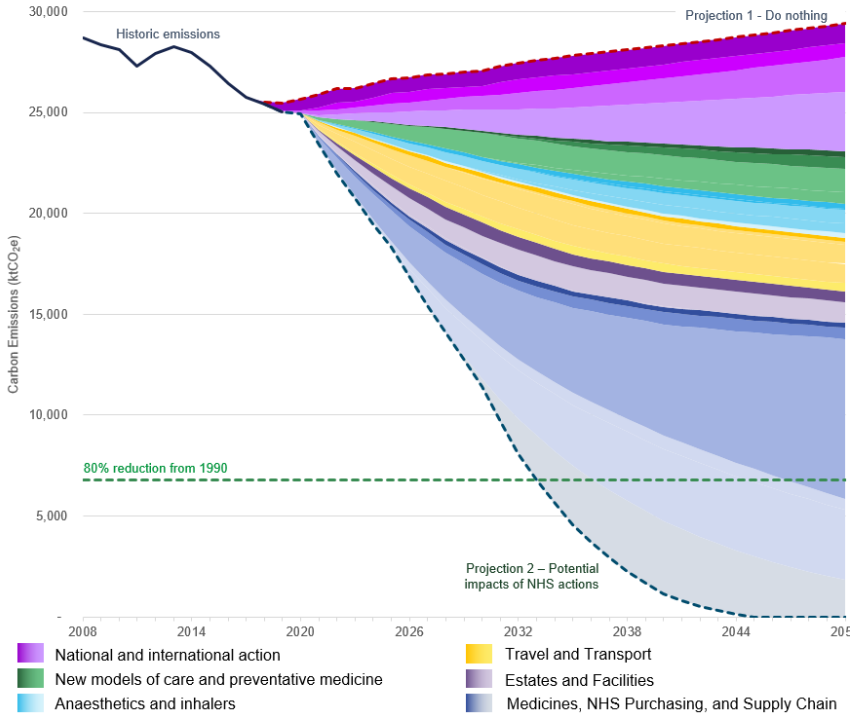
Background: NHS emissions and targets

Our aim is to be the world's first net zero national health service. The NHS has two targets to reduce emissions against 1990 levels:

- Reach net zero by 2040 for the emissions we control directly (the NHS Carbon Footprint), with an 80% reduction by 2028-2032;
- Reach net zero by 2045 for the emissions we can influence but don't directly control (the NHS Carbon Footprint Plus), with an 80% reduction by 2036-2039.

Pathway to net zero for the NHS Carbon Footprint Plus scope
Source: Delivering Net Zero NHS report, October 2020

($MtCO_2e$)	1990	2019/20
Carbon Footprint	16.2	6.1
Carbon Footprint Plus	33.8	25.0

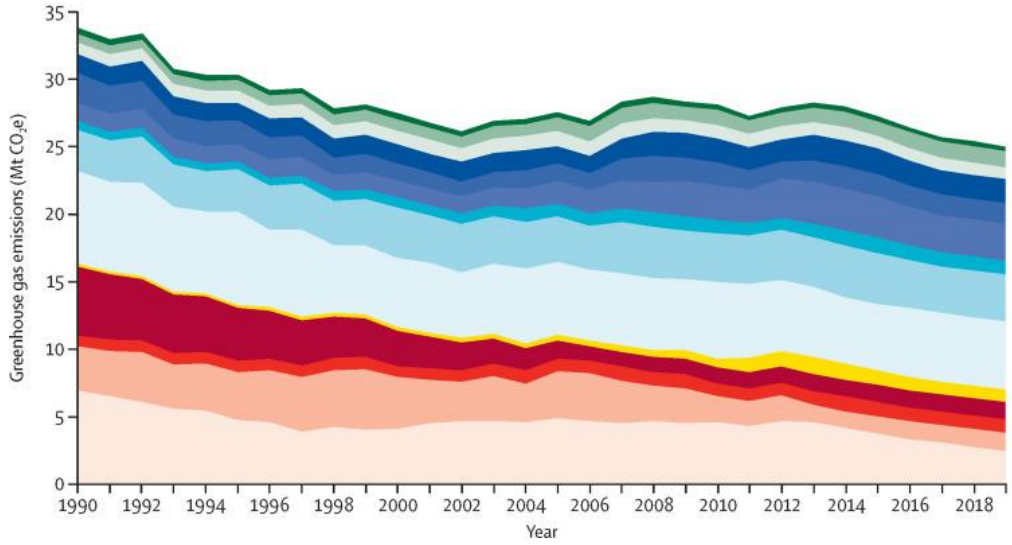


Background: 1990 baseline

- UK measures progress vs 1990 levels under the Climate Change Act (2008), relating to international conventions

- NHS also sets targets vs 1990 levels to show equivalent ambition against the UK national targets

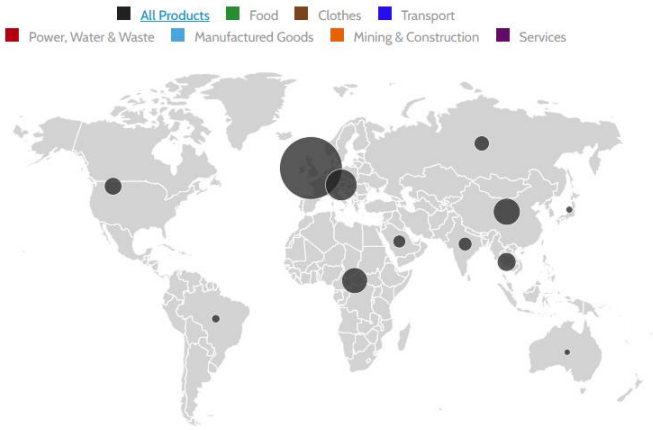
- Do you need to do the same? What is a sensible benchmark year for your organisation?



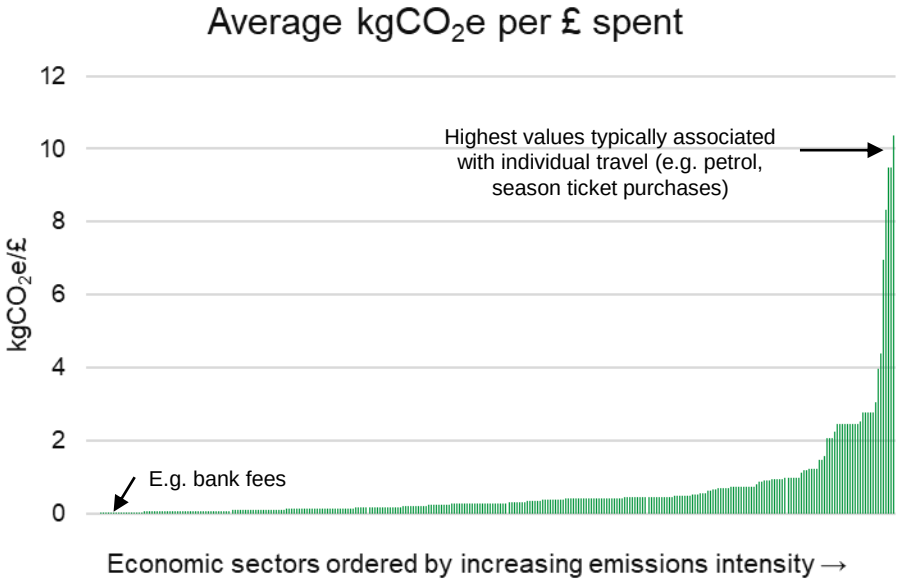
Footprint data: how NHS emissions are calculated

Environmentally-extended input output model (EEIO)

- ‘Top-down’ expenditure-based approach of estimating emissions.
- Same model used by Defra to calculate the UK’s Carbon Footprint.
- Based on HM Treasury/ONS accounts of NHS expenditure mapped to CO_2e/£ expenditure factors across 105 different economic sectors and global regions.



Expenditure £	×	tCO_2e per £	→	tCO_2e
HM Treasury / ONS / Trust Accounts		Emissions factors from EEIO		Top-down footprint



https://www.gov.uk/government/statistics/uks-carbon-footprint

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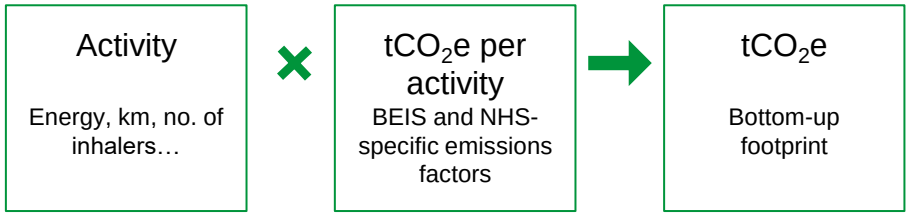

Bottom-up data

- Activity-based (e.g. energy use, miles driven, no. inhalers prescribed) methods of estimating emissions.
- Used to replace expenditure-based estimates where better data are available:
  - Energy, waste and water
  - Anaesthetics
  - Inhalers
  - Fleet
- As a general rule, more accurate, timely, and more reliable at sub-national level.
- Over time, aim to shift further towards bottom-up modelling approaches.

Department for Business, Energy & Industrial Strategy

2021 Government Greenhouse Gas Conversion Factors for Company Reporting

https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

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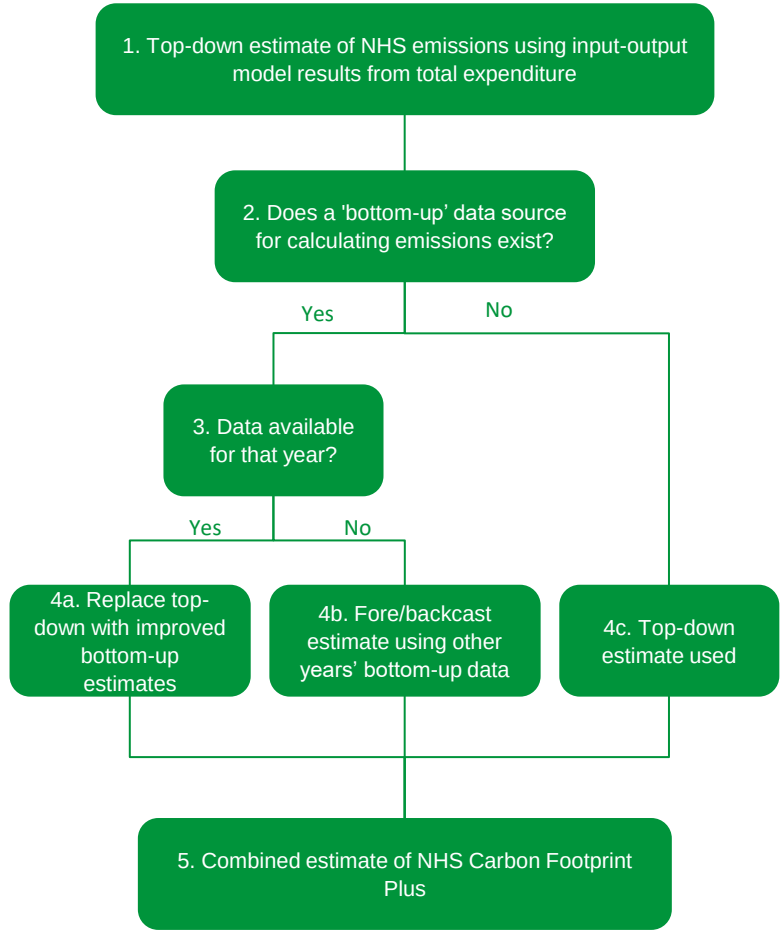


Identifying data: areas for data gathering

Buildings:

- Energy bills x BEIS emissions factors
- Waste volumes (and composition) x BEIS emissions factors

Fleet:

- Fuel consumption x BEIS emissions factors
- Vehicle efficiency x assumed mileage x BEIS emissions factors

Travel:

- Staff/patient/visitor numbers x assumed mileage x assumed emissions per mile
- Survey-based approaches

Inhalers and anaesthetics:

- Gas volume or prescriptions x specific emissions factors

Supply chain

- Expenditure in different economic sectors x CO2/£ spent emissions factors
- Some suppliers may provide product-level carbon intensities
- Some emissions factors in BEIS dataset for specific products

Uncertainty in footprinting

Carbon footprinting is highly uncertain

In general, fuel combustion and electricity is easier, non-CO2 emissions and supply chain are harder.

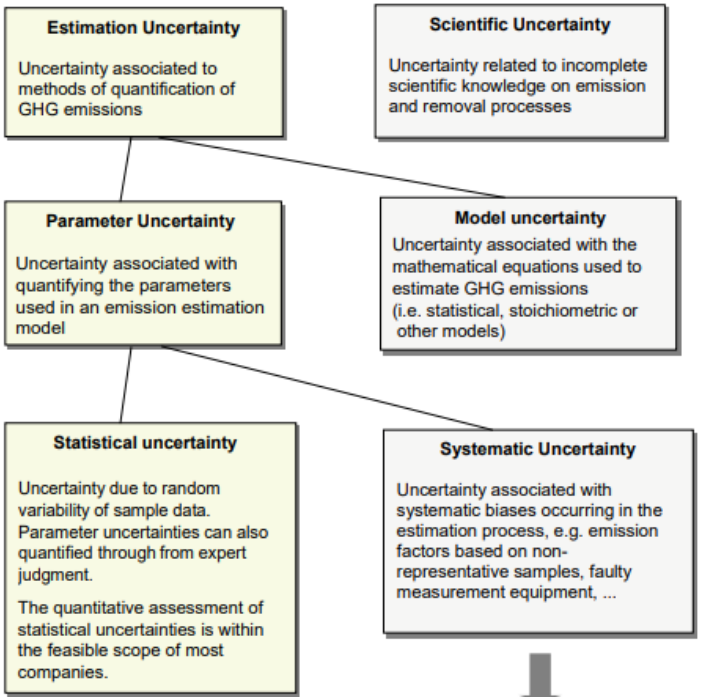
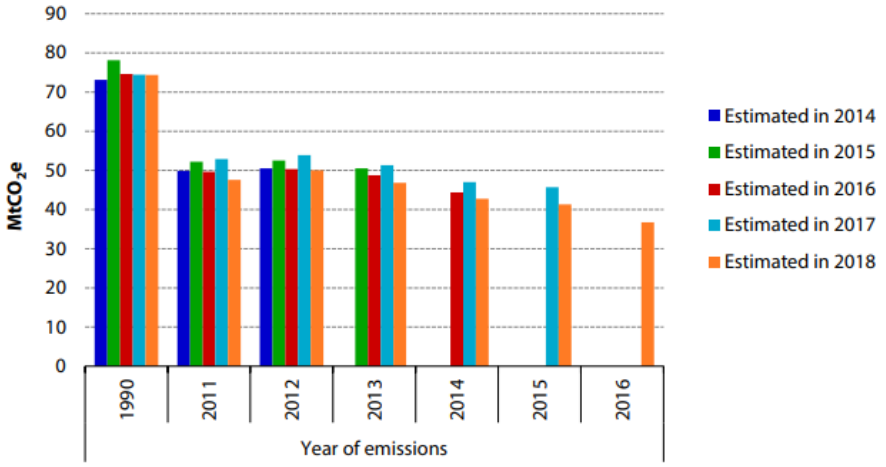


Figure 1.2. Revisions to Scottish emissions estimates between inventories published in 2014-2018



CCC (2018) Reducing emissions in Scotland Progress Report to Parliament

Greenhouse gas emissions uncertainty

Defra published research on the uncertainty in the estimates as part of a previous report on consumption-based CO_2 emissions between 1992 and 2004. The research showed that the relative standard error for total CO_2 consumption emissions in any one year lies within the range of 3.3 per cent and 5.5 per cent. Since then there have

Uncertainty in footprinting: year-on-year changes

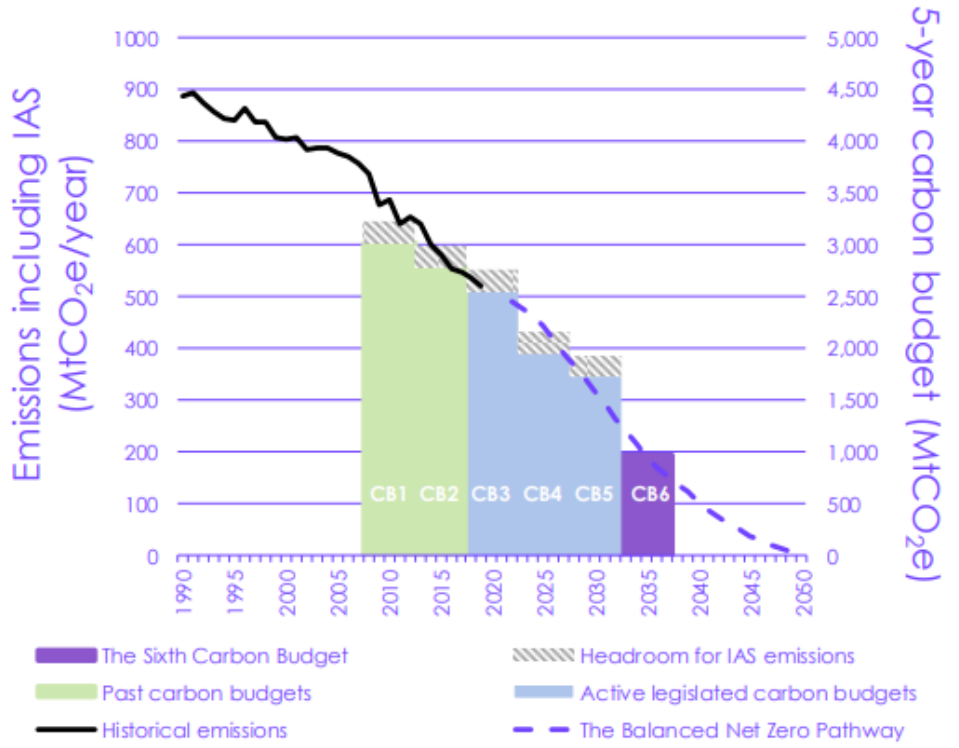
Accept uncertainty as an inherent part of the process and communicate that to senior leadership

‘Real world’ emissions are causing warming - regardless of the calculated number

Try to control for uncontrollable external factors (recession, weather, COVID, global energy markets) and highlight underlying / structural changes

When setting targets, consider mechanisms that allow for variation – including use of ‘budgets’ or percentage reduction targets

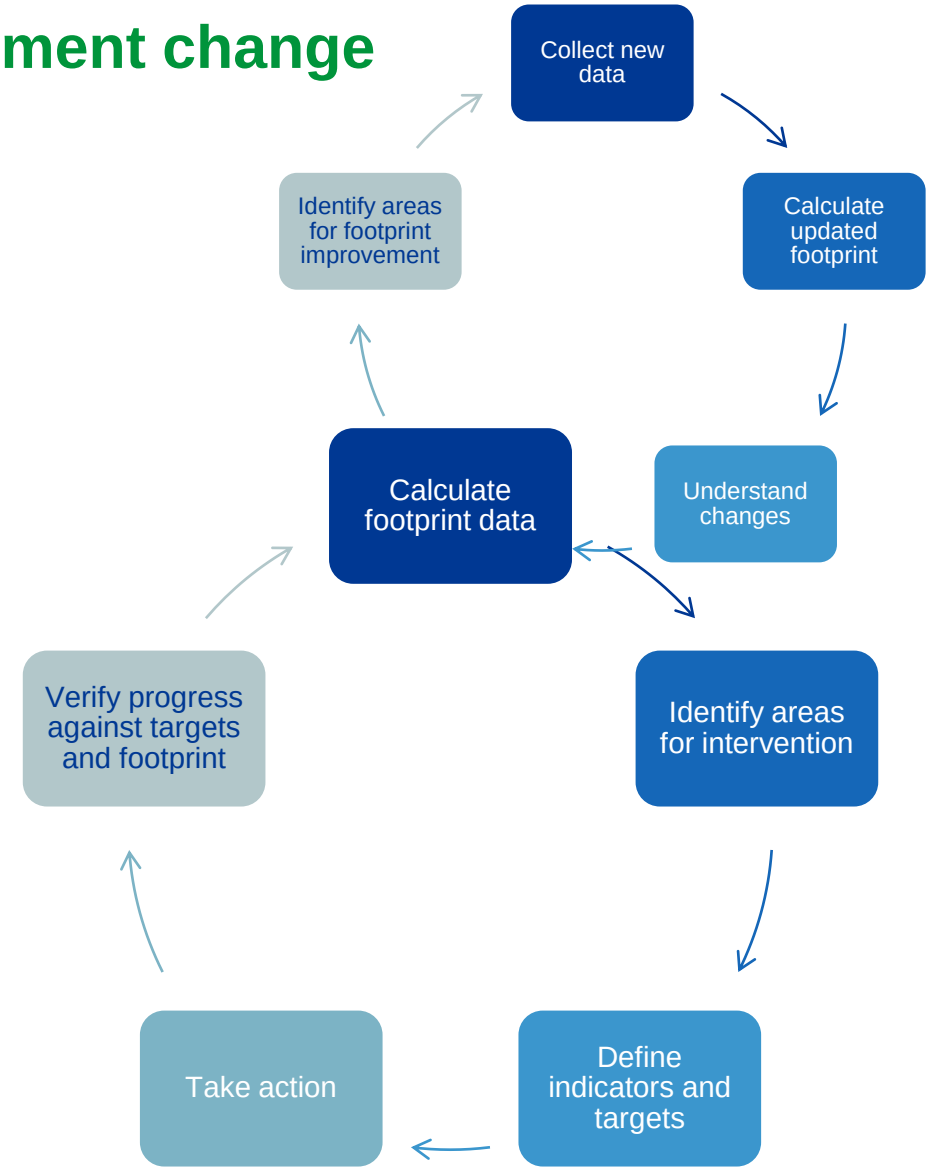
Figure 1 The recommended Sixth Carbon Budget



Using baseline data to implement change

Organisational uses for footprint data:

- Identify ‘hot-spots’ for prioritisation
- Benchmark against similar organisations
- Verify progress after interventions
- Understand the scale of what is required
- Understand current environmental impacts in cost-benefit analysis
- Consider roll for (limited!) offsetting



Other tools and resources – external from NHS

RCGP's Green Impact for Health Toolkit

https://www.greenerpractice.co.uk/green-impact-for-health-toolkit

GP Carbon Calculator

https://www.gpcarbon.org

CDP (Carbon Disclosure Project)

https://cdp.net/en

Green Book supplementary guidance

https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal