Integrating sustainability with (health) economics – practical steps and future direction

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Overview

- What is economics?
  - What is health economics?
- Health Economic evaluation
  - A tool for decision analysis
- Approaches to including environmental sustainability within decision analyses
- My preferred approach: Internalising the externality
- Practical application… enhancing ELLA with Economics (EcELLA?)

What is economics?

1 Scarcity

Resources are finite.

Our needs, desires and wants are “infinite”.

2 Decisions

Allocating resources one way means we cannot allocate them another way.

3 Opportunity cost

We lose the benefit of the alternative.

Foregone benefit = Opportunity Cost.

4 Economics

The study of resource allocation decisions:

What to produce

How to produce it

For whom to produce it

5 Efficiency & Equity

Resource allocation decisions bring both concepts into focus.

Health Economics

NHS

NHS reports busiest ever summer as heatwaves drive up hospital admissions

Record demand for A&E units, ambulance services and NHS 111 shows extreme heat having unprecedented impact on health, experts say

The treatment, which can give patients close to seven extra months to live on avera
initially rejected for widespread use for the NHS in England in 2024.

Thursday 17 September 2026 06:53, UK

ore than **1 month old**

in England face longer waits for ıealth care as NHS providers plan

Exclusive: Seven in 10 survey respondents expect services to be reduced or shut, while more than half anticipate job losses

News

Most run-down NHS hospitals named and shamed – as staggering £14billion is needed to fix crumbling wards that pose a 'catastrophic' risk to patients

by **LONDON MAIL** — August 16, 2025 *in* **Health** Reading Time: 10 mins read

er drugs o
od cancer

Most nurses have had to treat dying patients in hospital corridors

Telegraph Reporters
2 Sep 2026, 6:00am

Health Economic Evaluation

- Most well-known tool in the kit
- AKA Health Technology Assessment (although definitions vary)
- One approach: decision-model based cost-utility analysis

Clinical trial results

Statistical extrapolations

Long term prognosis

Quality of life

Decision model

Costs of drugs

Cost of hospitalisations, primary, tertiary care, social services

Treatment A

Cost & outcomes*

Treatment B

Cost & outcomes*

*Ideally life expectancy adjusted for quality, Quality Adjusted Life Years (QALYs)

Making a decision

What is the added cost?

What is the added benefit?

What is the added cost per unit of added benefit?

Incremental cost-effectiveness ratio

$$\textbf{ICER} = \frac{C_B - C_A}{E_B - E_A}$$

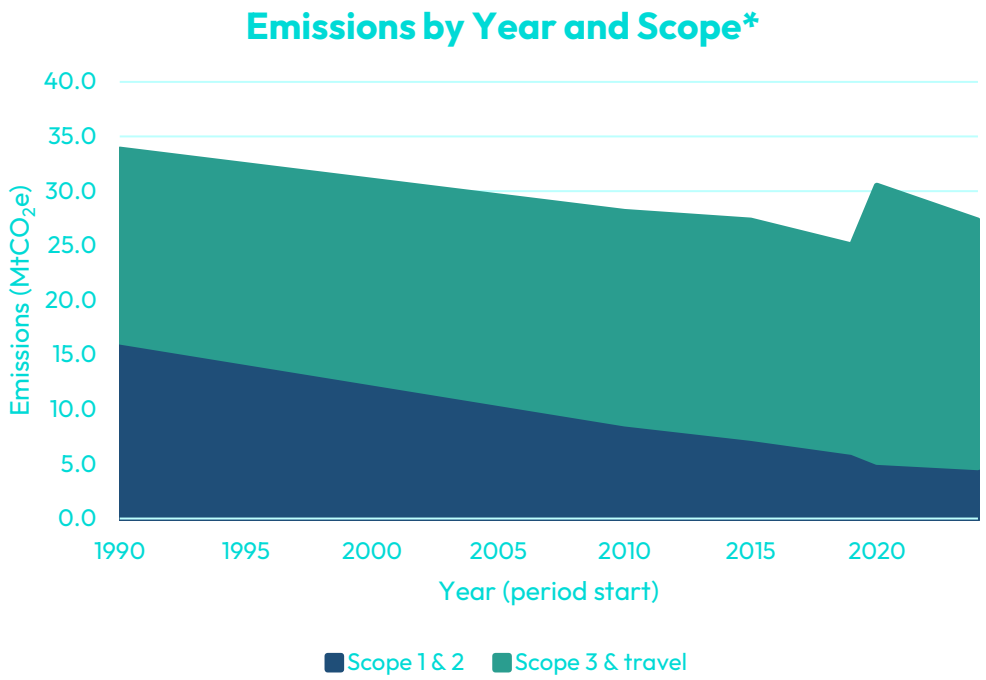
Is it worth it?

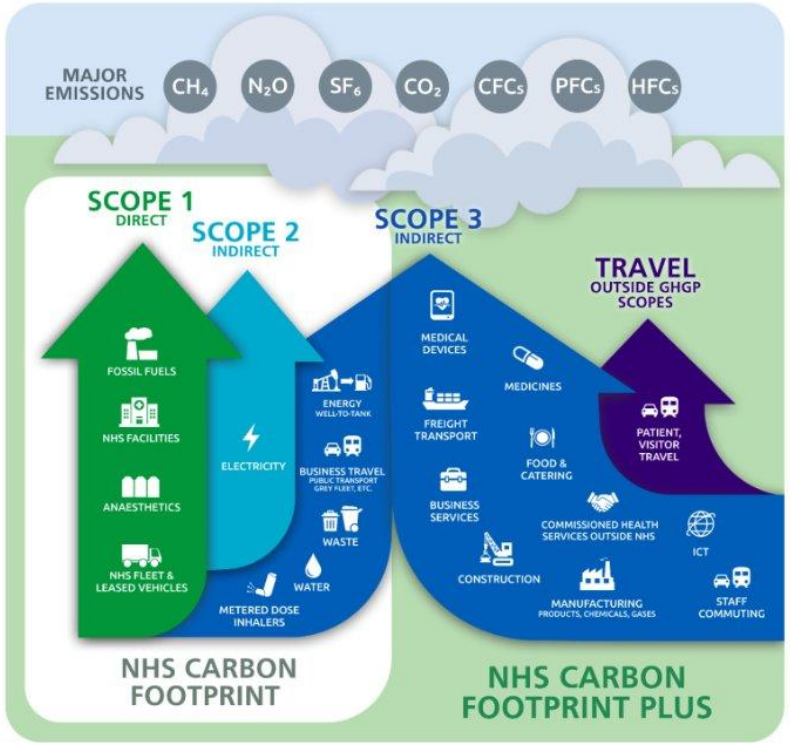
NICE National Institute for Health and Care Excellence

Below a most plausible ICER of **£25,000** per QALY gained, the decision to recommend a technology is normally based on the cost-effectiveness estimate and the acceptability of a technology… Above a most plausible ICER of **£35,000** per QALY gained, the committee will need to identify an increasingly stronger case for supporting the technology as an effective use of NHS resources.

What about sustainability?

- NHS England has a legal obligation to be completely Net Zero by 2045
- Question is how do we combine carbon emissions into HTA?



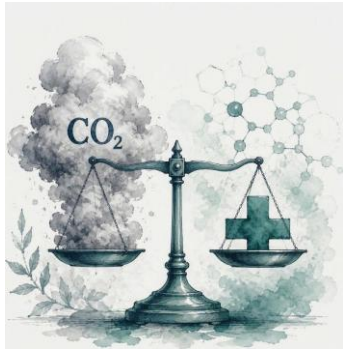


***Methodology change in 2025 and retrospectively applied to 2019/20–2024/25. Therefore 2020 onwards not comparable with pre-2020**

Six approaches to combining sustainability in HTAs

Parallel reporting

Convert to health damage



Carbon-specific ratios

MCDA / deliberation

Environment-focused HTA

Internalising externalities

Toolan et al 2023, Williams et al. 2024, Ducrot et al. 2025, Kindred et al. 2024, de Preux et al. 2018

“Internalising the Externality”

$$\textbf{ICER} = \frac{C_B - C_A}{E_B - E_A}$$

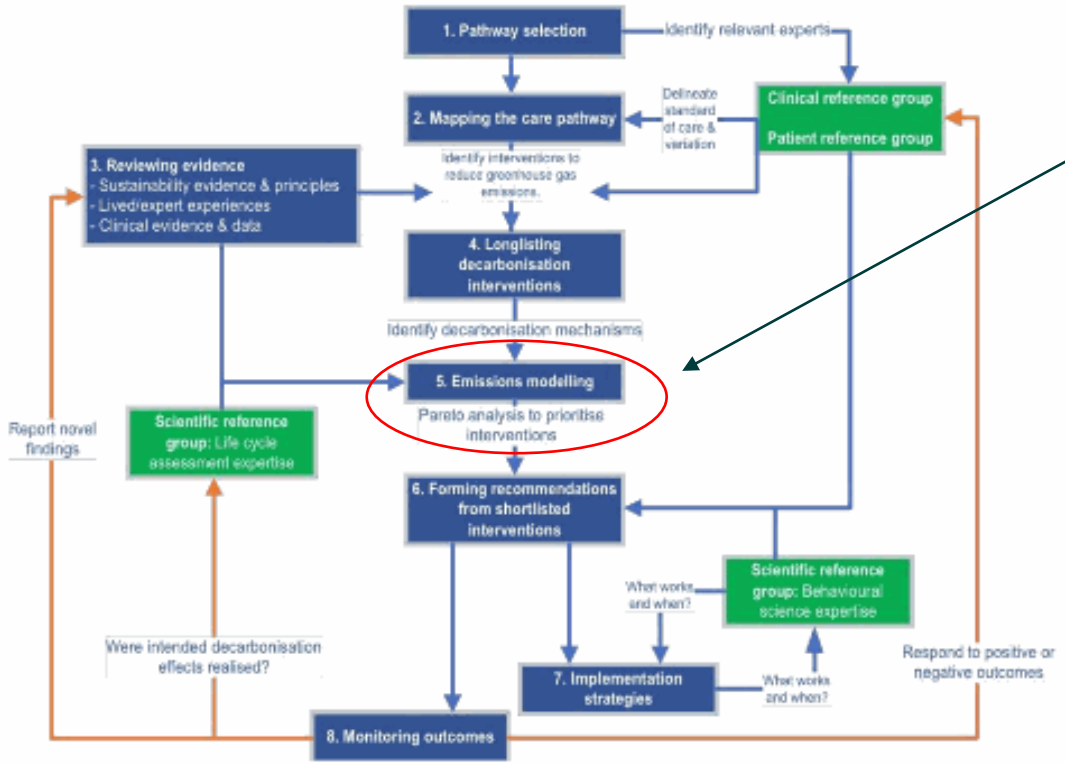
$$C_i = C_{d,i} + C_{h,i} + C_{c,i}$$

Drug cost

Other healthcare expenditure

Carbon cost

Practical steps to combine economics with ELLA



Cost and health outcomes

	Status quo	Low carbon	Difference
Primary care	£££	££	-£
Secondary care	££	££	+£
Specialist care	£	£	-
Patient OOP	£	££	+£
Industry	££	£££	+£
Health outcomes	♥	♥	-

Diagram: John et al. 2025

How to add costs to ELLA

"Better to be approximately right than precisely wrong"

1. **Define the patient pathway / journey**
2. **Decide on scope of costs**
   - Whose costs? NHS? Industry? Patient?
3. **Define categories**
   - Primary, secondary, OOP, Industry
4. **Define items within categories**
   - GP visits, OP attendances
5. **Measure the resource use (Q)**
6. **Value the resource use (P)**
   - Standard NHS data sources
   - Cost = P*Q
7. **Sum across all categories to calculate total**

Caution: Be aware the risk of double counting if industry costs are passed on to NHS through higher prices

Ideally estimate the costs within one 'state of the world' and then with another (eg with lower carbon pathways), and take the difference to estimate impact

...but it may be easier simply to measure the change.

What about health outcomes?

Where possible measure and value these

Formal approach:

Quality Adjusted Life Years > decision modelling (probably) required

Pragmatic approach:

- Identify any *changes* likely in health outcomes due to pathway change
- Describe change qualitatively
- Review of literature to quantify any changes in either clinical units or overall quantity & quality of life (QALYs)

Summary

- **Economic evaluation** compares added costs and health benefits, recognising finite resources and opportunity costs.
- **Environmental impacts** can enter HTA in several ways. The preferred approach here adds a monetary carbon cost to healthcare costs ("internalising the externality").
- **Economics bolt-on to ELLA** compares current and lower-carbon pathways, showing who bears the costs and who benefits.
- **Costing** starts with scope and resource use × unit cost. Include relevant NHS, patient and industry costs without double counting.
- **Health outcomes** use QALYs where feasible and sensible, or describe likely changes and quantify them from the literature.