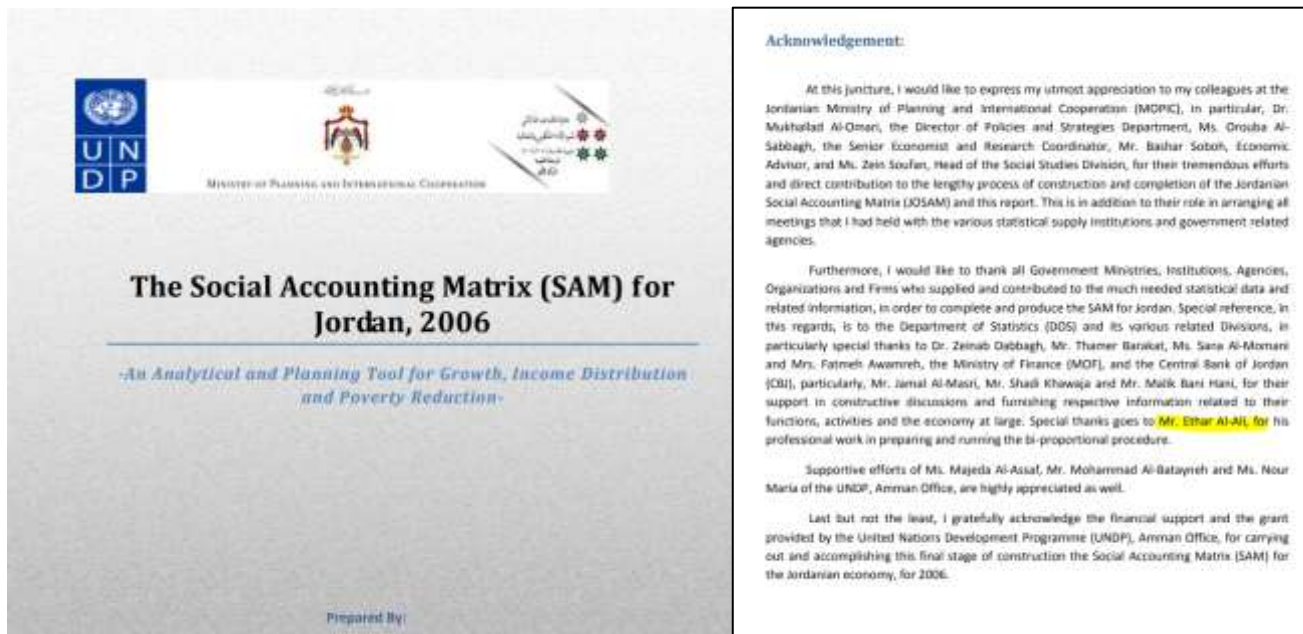


CIRCULAR PLASTIC ECONOMIES

Greening Care





Ethar Alali (he/his) *Founder CEO Automedi*
 Climate-econometrician | Mathematician | Technologist |
 Inventor | Activist

- JOSAM, United Nations Development Programme (2012)
- Health-Climate-Economics (2020)
- Rapid viability test for supplier evaluation in sustainability and social good (2020)
- Specialist in Anti-fragile, Decentralised and Nonlinear business and economic models

Introducing Health-Climate-Economics and Rapid Viability Test for Candidate Solutions as a Tool for Automated Healthcare Procurement and Evaluation

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Abstract

The impact of the climate on the health of populations is now reaching the mainstream. The impact of health system decisions on the lives of its patients has been studied through several analyses and research projects that identified direct, unambiguous link between healthcare services and the effect on healthcare demand of those same services.

The UK NHS contributes the equivalent of 24 million tonnes of CO2 greenhouse gases to the climate footprint of the UK. This is 3.4% of the entire UK's Carbon footprint and is a value bigger than 2.6 million UK households or the entire emissions of 10 countries of Jordan, Croatia and Estonia. It is the UK's biggest single emitter of CO2 and consumer of single-use plastics. Directly contributing to the deaths of 40,000 people through respiratory diseases, 900 through heartstroke at a cost of almost £400 million annually.

The majority of the NHS carbon footprint (19 million tonnes of CO2) come through the NHS supply chain with only 5.5 million tonnes resulting from internal activity. Suggesting the biggest impact will be driven through changes to procurement.

Procurement currently assigns a range of importance to health and economic factors. Most procurement is conducted with a systematic split of quality and cost: 80:20, 70:30 or 60:40 ratios of quality and cost, while the NHS evaluates the evidence base by using Quality Adjusted Life Years and Disability Adjusted Life Years, both of which evaluate the gain the technology provides, but does not include the impact downstream of the patient, which result in this emissions footprint that in turn appears as A&E as healthcare demand.

Together, these factors suggest current deployed health-economic models are not sufficient to catch the future demand nor assess the lifecycle impact of climate effects on the service itself, via the population. This paper explores an alternative model that account for the impact of climate on the health-economic models and constructs an evaluation framework for supplier assessment.

Keywords: health-economic, sustainability, climate change, healthcare, circular economy, procurement, healthcare procurement, health-climate-economic modelling, sustainability in health procurement

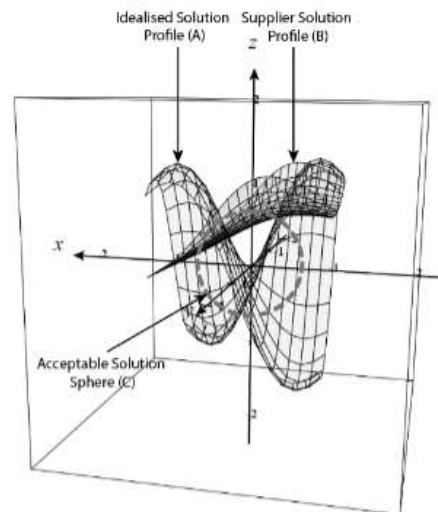


Figure 1-health-climate-economic solution space with "do nothing" solution sphere highlighted.



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Inventor | Activist

- Registered waste collector
- Bin deliverer
- Recycling operative
- Data scientist
- Systems engineer



Meet the pharmacies striving for a more environmentally friendly, greener sector

18 Feb 2022 | CASE STUDIES

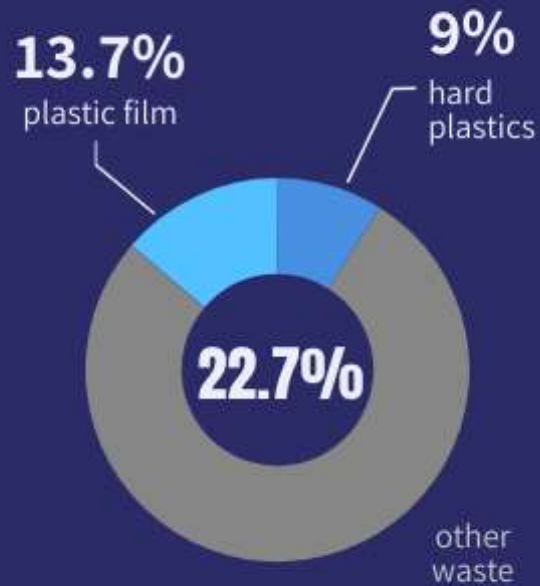
by Seta Jankovic



HEALTH PLASTICS

NHS plastic waste is significantly higher than other industries. Around 133,000 tonnes of plastic is disposed of by the NHS each year with only 5% of this waste currently recovered.

With 1 million mostly plastic PPE items being used every 36 hours during the 2020 COVID-19 pandemic, this is a significant amount of waste that isn't recycled



NHS plastic waste



5 MILLION TONNES

Annual Plastic Consumption



NHS Annual plastic waste production

PLASTIC POLLUTION

A MISUNDERSTOOD VILLAIN

Majority of plastics' problem is oil & embodied Carbon (production, transport and disposal) from the supply chain

- Other materials have large footprints and use water and energy in ways plastic doesn't.
- NHS recycles 67% less plastic than the worst performing local authority.
- The precautionary principle means 22.1% of incinerated plastics is misclassified as infectious plastic.
- While work is being done to move to more sustainable materials, sometimes this significantly increases overall footprint.

Climate in Health-Economics

LINEAR ECONOMIES

The NHS Carbon Footprint+ is 6.8% of UK total Carbon emissions. Contributing to almost 40,000 deaths & £345 million in yearly respiratory treatment costs

DID YOU KNOW?

CO2e of 1kg plastic:

- + 5.5kg Oil Processing
- + 5.1kg Manufacturing
- + 0.23kg Freight
- + 0.55kg Disposal

= **11.38kg CO2e**

= **15.4p of Care Costs**

Upstream Impact



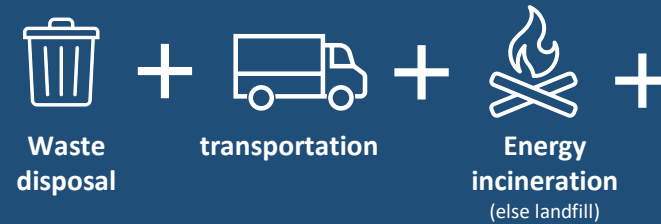
Energy consumption 1.27 Gt CO2e industrial emissions (plastics only)



2MtCO2e (per factory)

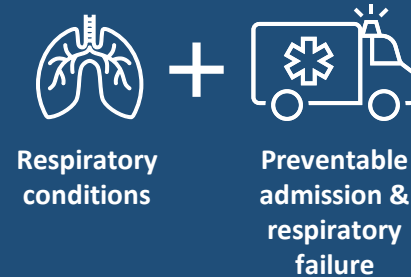
20.1MtCO2e (annual)

Downstream Impact



800MtCO2e

365.75 tCO2e



£345 million
40,000 deaths
 2x EDR : 60 to 69 years old
 11.6 x EDR: 80+ years



AIR QUALITY IMPACTS RESPIRATORY DEMAND, WHICH IMPACTS ITSELF

Classical Procurement

Category	Products and services	Providers
Medical	Ward-based consumables	DHL (Life Sciences and Healthcare)
	Sterile intervention equipment and associated consumables	Collaborative Procurement Partnership LLP
	Infection control and wound care	DHL (Life Sciences and Healthcare)
	Orthopaedics, trauma and spine, and ophthalmology	Collaborative Procurement Partnership LLP
	Rehabilitation, disabled services, women's health and associated consumables	Collaborative Procurement Partnership LLP
Capital	Cardiovascular, radiology, endoscopy, audiology and pain management	Health Solutions Team (HST)
	Large diagnostic capital equipment, including mobile and services	DHL (Life Sciences and Healthcare)
	Diagnostic, pathology and therapy technologies and services	Aksoo & Co
Non-medical	Office solutions and services	Crown Commercial Services
	Food	Foodbuy
Support services	Hotel services	NHS North of England Commercial Procurement Collaborative
	Logistics	Unipart Group
	Supporting technology	DXC Technology

Unaccounted for

9.720 kg CO₂e (per inhaler)



Inhaler/Nebuliser Demand

Disconnection Line



2%

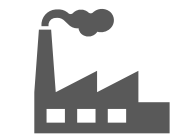
Respiratory demand

862,500 bed-days
24m tonnes CO₂e

Respiratory Treatment

Disconnection Line: Never the Twain Shall Meet

Estates Services (Waste Disposal – Waste to Energy)



Waste to Energy

Disposal Through

CONTEXT IS EVERYTHING!

**Community Supply &
Disposal**



52g/CO₂e

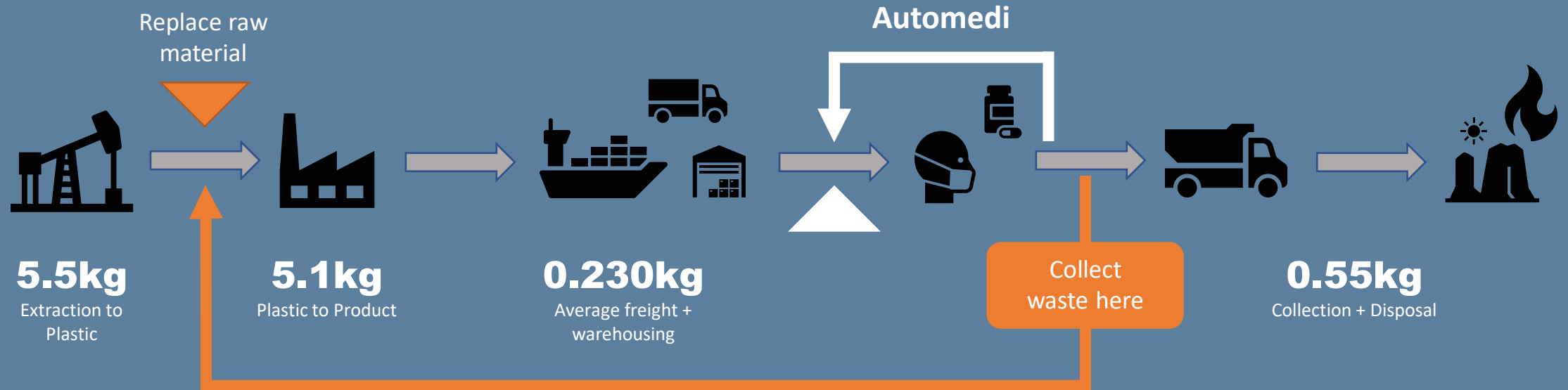
**Acute Care Supply &
Disposal**






1.1 to 1.7kg/CO₂e

CIRCULAR ECONOMIES

Comparative Footprint for 1kg of plastic

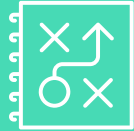


-  11.38kg Linear Economy Footprint
-  5.33kg Conventional Circularity
-  0.22kg Automedi Circularity

TIGHTER CIRCULARITY



Maximise Climate Protection



Nearsource Subscription



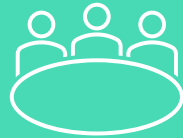
Full lifecycle Reporting



No Freight Emissions



Eradicate "Single Use"



Social Value: New Economy



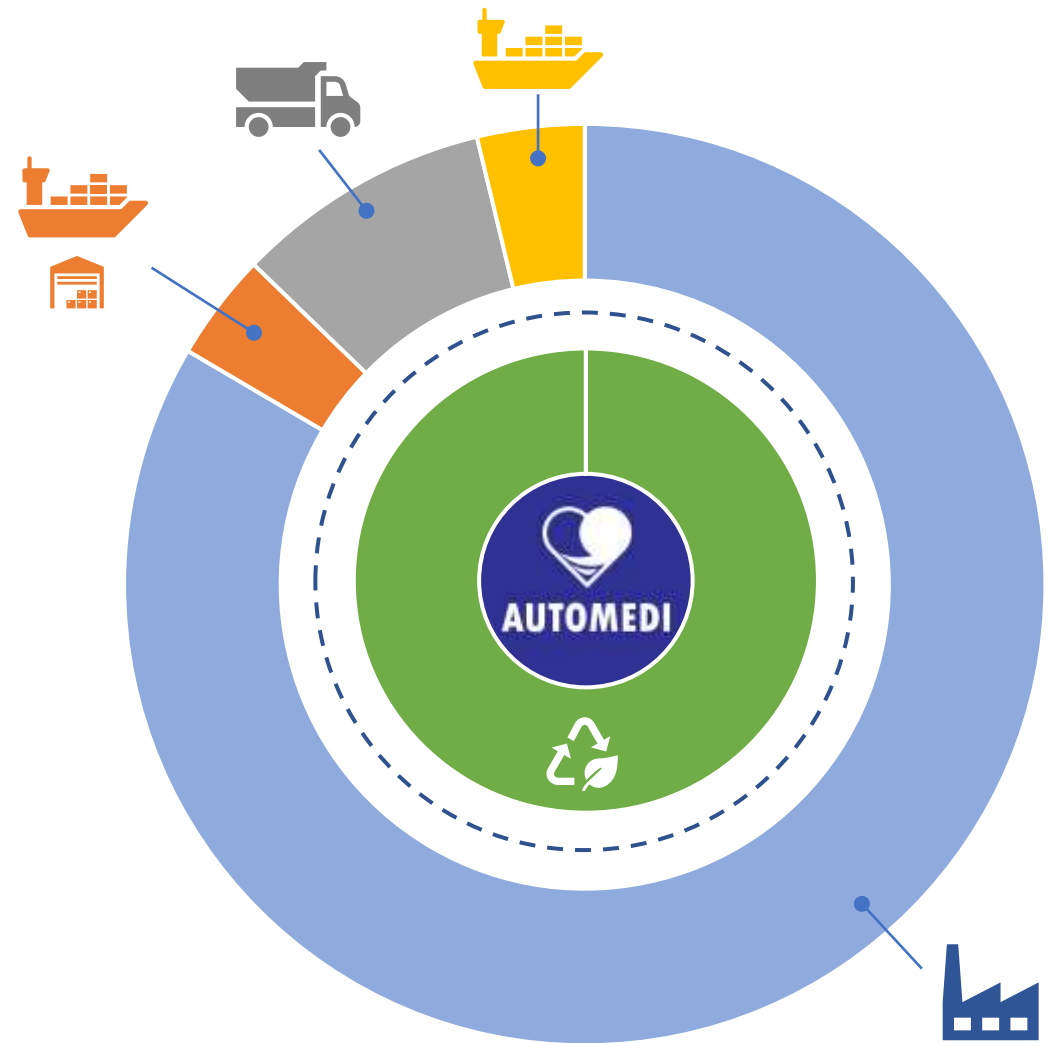
Greener Supplies



Massive Scale



Resilient Supplies



■ Manufacturing ■ Freight ■ Collection ■ Disposal Freight

#REMASKED: MANCHESTER ICS CIRCULAR PHARMAPLASTIC DEMONSTRATOR

Community pharmacy hosted 3D print machines that accept orders directly from e-commerce sites, drop-ship plugins or a tap on its “vending” interface.



“Made in Stretford by Alphabet Pharmacy”

UPCYCLED SUPPLY & ACCESSORIES

Traditional PP facemasks become equipment, fixtures & fittings simultaneously saves:

- **80%** on the cost of new equipment
- **£70/tonne** in disposal
- **92%** Lifecycle **CO₂**

“Triple Bottom Line”



Sample: Dissecting Forceps

✘ Classical Buy
Cost: £3.18
(inc delivery & VAT)
Embodied CO₂: 61g
Disposal CO₂: 17g

✔ via Automedi
Cost: £0.14
(delivery on rounds)
Embodied CO₂: 3g
Disposal CO₂: 2g

MADE FOR PENNIES

Facilities & Electrical



Mask Comfort
(e.g. ear savers)



Catering Storage & Clips



Washers & Seals



#REMASKED PCN CIRCULARITY

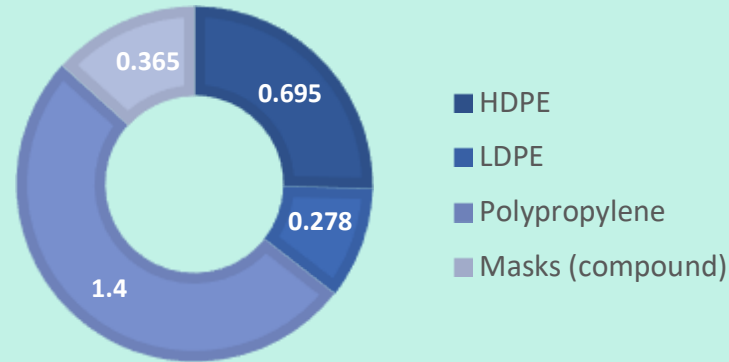


2.738kg

Plastic Mass

(excluding elastomer & metal)

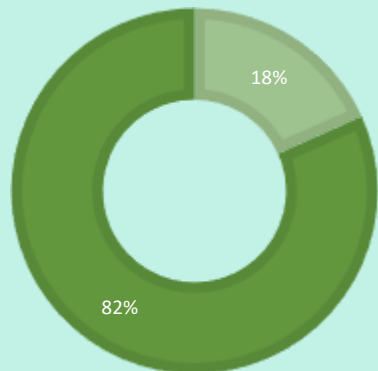
Material Weight (kg)



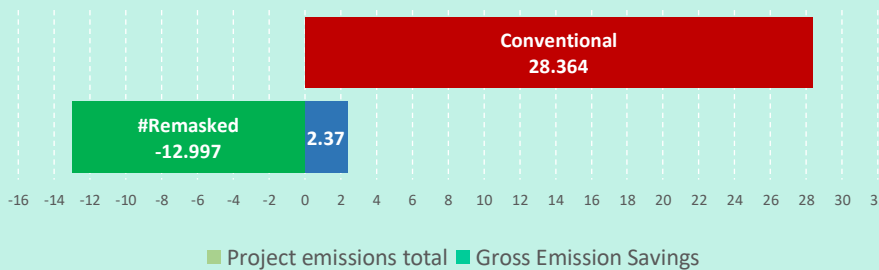
£0.67 /kg

Respiratory Treatment Savings

705kg = 1 overnight patient treatment



■ Manufacturing & Raw Materials
■ Freight & Disposal



*conventional supply chain v circular plus one replacement cycle

Emissions Comparison

10.627kg
Net Carbon Saving

equivalent saving

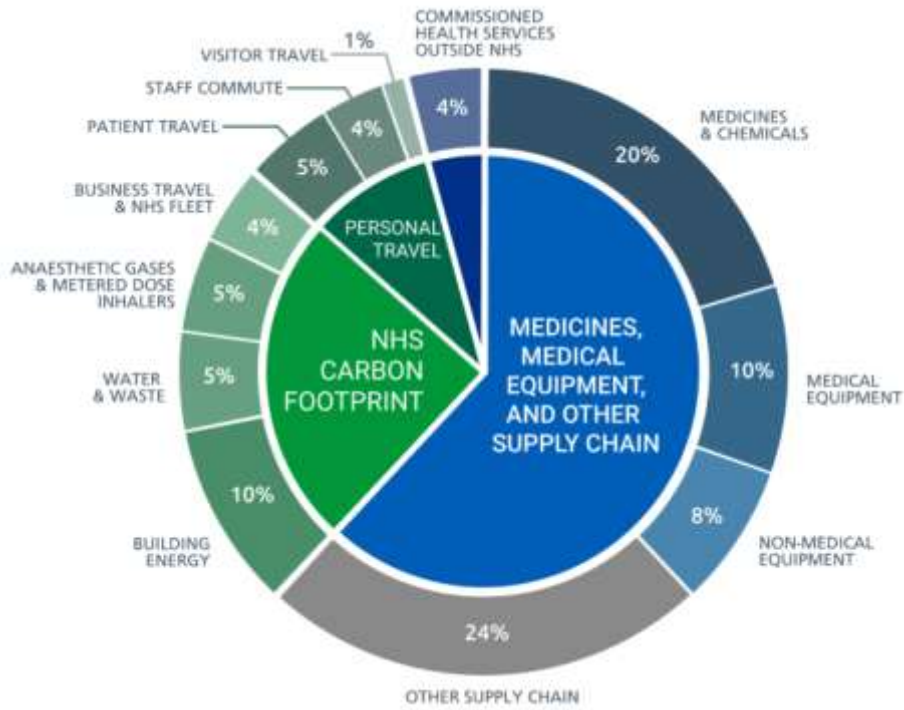


71.57
miles



4.2
tree years

#NO SILO



Medical Equipment	✓		✓	✓	✓		✓		✓
Non-medical Equipment	✓							✓	✓
Other Supply Chain						✓		✓	✓
Building Energy									✓
Waste & Water		✓				✓			✓
Anaesthetic Gases & Inhalers									✓
Business & NHS Fleet Travel									✓
Commissioned Health Services Outside NHS									✓

NHS PRIORITY ALIGNMENT

Circular plastic micro-economies provide a very easy system-wide change and is as close to an ideal solution as possible.



Tips for Circularity

1. Gemba - Go Walk!
2. Model Multigenerational Lifecycles the whole thing pan in Context
3. Optimise for System, not Stage nor Category
4. Procure “Plug-and-play” Providers
5. Make Circles tight
6. Don't Settle for PPN06/20 & PPN06/21



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Behind the scenes: [instagram.com/WeAreAutomedi](https://www.instagram.com/WeAreAutomedi)

#Remasked Project: www.remasked.org

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Delivering a net zero NHS (<https://www.england.nhs.uk/greenernhs/a-net-zero-nhs>)

PPN06/20 Taking Account of Social Value

(<https://www.gov.uk/government/publications/procurement-policy-note-0620-taking-account-of-social-value-in-the-award-of-central-government-contracts>)

PPN06/21

Taking account of Carbon Reduction Plans

(<https://www.gov.uk/government/publications/procurement-policy-note-0621-taking-account-of-carbon-reduction-plans-in-the-procurement-of-major-government-contracts>)

