



CASE STUDY: PLASTICS CIRCULARITY IN COMMUNITY CARE 2022

Circular microeconomies in Greener Pharmacies



Greener NHS North West

HEALTHIER PLANET
HEALTHIER PEOPLE

NHS

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Healthcare and pharmaceutical plastics pose a unique challenge to mother nature. The already significant footprint of routine plastic waste is coupled with significant transportation and disposal emissions, though a complex, bespoke supply chains. Creating a health demand from emissions and material pollution that ultimately has nowhere else to go but back into healthcare. Adding billions of US dollars in preventable treatment to the workload of an already health workforce, that would be better spent on capacity building, better access to healthcare and improving patient flow.

While APIs and OEMs track material, once patients picks up prescription medicines that scent is lost.

Patients are encouraged to return unused drugs but that's not true for packaging. Most end up in landfill because local authorities can't recycle them. Impacting the climate, and impacting us.

Circular economies provide a unique opportunity to resolve both emissions and waste problems. Careful engineering and deployment can provide circular products cheaper than either conventional buying or waste processing alone and amplifies the social good.

Ethar Alali



Ethar Alali
CEO & Founder

THE COMMUNITY CARE CONTEXT

NHS Standard Contract, 2023

In October 2020, the National Health Service Set ambitious targets to become the worlds first carbon neutral health service by 2040, and to including all providers by 2050.

It's emissions totalled 25.5 million tonnes of carbon dioxide equivalent delivering care and costing the service £345 million pounds to treat the resulting respiratory illness.

The changes are far reaching. Requiring all service providers to have in place a “Green Plan” that shows the roadmap full carbon neutrality, and to both measure and report against those target objectives in its annual reports every year.

DID YOU  KNOW?

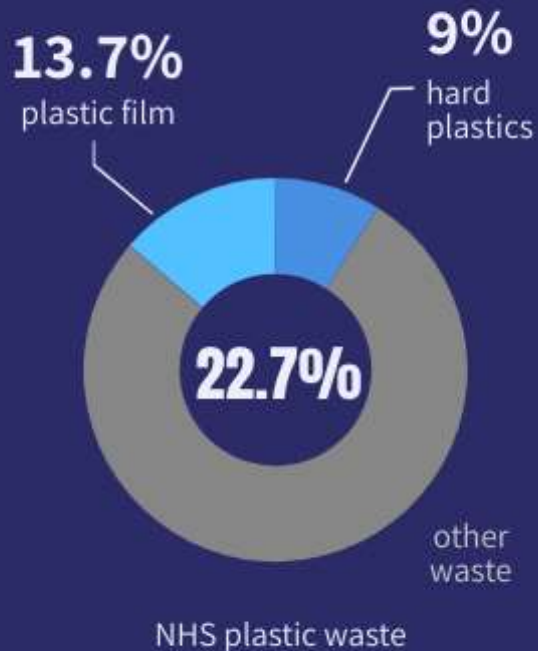
The new NHS Standard Contract Service Conditions 18.1 – 18.5 cover sustainable development. Failure to comply is deemed a breach.



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



5 MILLION TONNES

Annual Plastic Consumption



PLASTIC POLLUTION

A MISUNDERSTOOD VILLAIN

Plastics has been the focus of worldwide efforts to clean up human pollution. However, the vast majority of plastics problems come from oil and its mechanism of production and disposal. Not from the concept of plastic itself.

Other materials can have much higher footprints and use water and energy in ways plastic does not. The biggest contributor to plastics footprint is the embodied carbon from the rest of its supply chain.

At 5% of the plastics it outputs, the 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 good work is being done to move to other, more sustainable materials, it is a longer process and sometimes increases overall footprint in the wrong context.

SERVICE OBLIGATIONS

Conditions SC18.1 - SC18.5

The new NHS contract service conditions are a step-change in the level of planning and monitoring service providers must conduct to meet these sustainable development obligations.

Pharmacy has a wide sustainability fluency. While many care providers are confused by the vocabulary, they also have active, vibrant communities of sustainable practise, seeking change for the betterment of the climate and so, patients by proxy.

The new service contract obligations can be broadly categorised under 5 main clauses tackling these 6 main themes.

SERVICE CONDITION OBLIGATIONS



Maximise
Environmental
Protection



Maintain
A Green Plan
& Report Progress



Quantify & Report
Impact



Reduce Fleet &
Building
Emissions



Eradicate Single
Use Plastics



Have Regard to
Social Good

GREEN RECOVERY OPPORTUNITIES

Community Pharmacy: Beyond convention

Pharmacies can be central players in a green future, with multiple new revenue streams in materials the NHS and pharmaceutical companies cannot track once dispensed.

The pandemic of 2020 changed pharmacy's role and highlighted the fragility of existing supply chains.

Pharmacies can become alternative suppliers for a wide range of accessories used within health, community care, property maintenance, schools and colleges. Utilising the materials that would otherwise be destroyed and capturing revenue from conventional waste collection spend.

PHARMACY OPPORTUNITIES



£50
billion

CleanTech Market
Size



Save 24bn CO2e
NHS Priority



9,085 UK GP Practises
5,500 Care Services
60,000 Physios



133,000tn NHS
Plastics Waste



11,300 Community
Pharmacies



Opportunity for
84% Single Use
Plastic Reduction

“Each year in the UK, around 40,000 deaths are attributable to exposure to outdoor air pollution, with more linked also to exposure to indoor pollutants.”

*“The lifelong impact of air pollution”
Royal College of Physicians, 2016*

Climate to Health-Economics

POUNDS + YEARS + CARBON

The NHS Carbon Footprint+ is 6.8% of the 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



CROSS-SILO SAVINGS MODEL

THE ROBIN HOOD OF CARBON

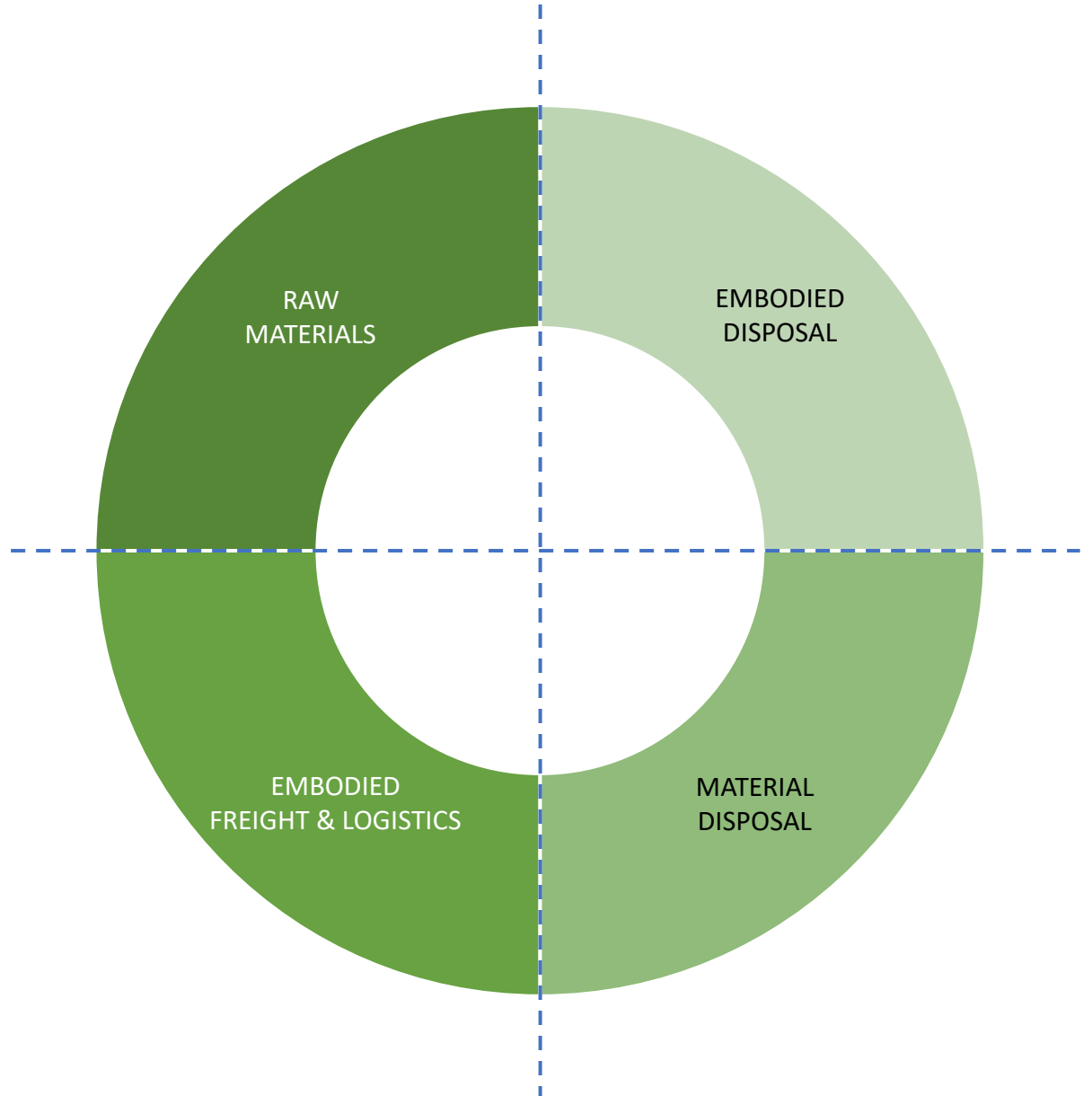
Circularity delivered by subscriptions lets pharmacies and community providers reprocess their own waste into non-care products for local communities. Optimising profitability across the manufacturing and disposal sectors in both cash and carbon.

DID YOU KNOW?

Optimising across supply and disposal, can offer community services a smart, comprehensive circular alternative that is cheaper than siloes can deliver alone.

Better still, it's easier to procure!

One subscription a month



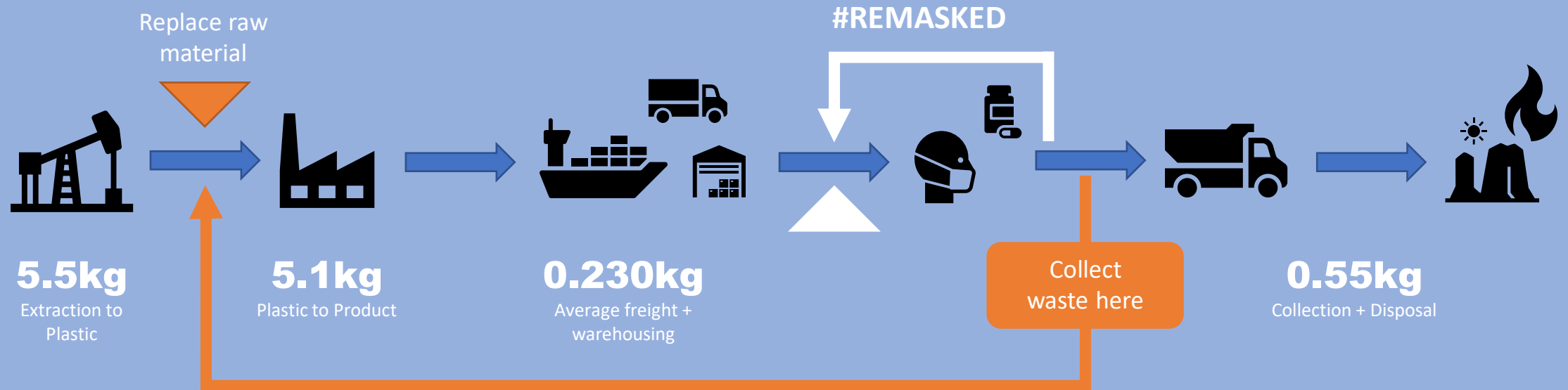
“Circular economies bypass many of the steps in conventional supply chains. Reducing processing and emissions. Plus, the tighter and closer those circles, the less transportation is needed and the smaller the footprint.

Local circular economies bypasses almost all conventional logistical processes. Ensuring supplies can be delivered quickly without storing copious amounts of material and freight and removing huge amount of CO2 at the same time.

Making the economics and supply more resilient.”

CIRCULAR v LINEAR ECONOMIES

Comparative Footprint for 1kg of plastic



11.38kg CO₂e
LINEAR ECONOMY FOOTPRINT

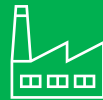
← 5.33kg Conventional Circularity
← 0.22kg **#REMASKED**

WIDER CIRCULARITY BENEFITS



Environment 89%

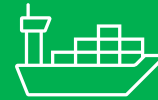
CO2e & Waste Saving



Works in whole
supply chain



10% of traditional
energy supply



Save 100%
freight CO2e



Future supplies
CO2e removal



Upcycle 100%
of all plastics



Economy 10,000

New jobs per major
European economy



4 jobs per
cluster



Meaningful
“good” work



Instant parts
supply



Outreach
manufacturing

€27bn

Annual medical
plastic value



Vocational
Skills & Training



Society 6

New vocational skill
needs from education



End multigenerational
unemployment



Resilient
supplies



Meaningful
“good” work



Adaptability skills
& training

56

per 100,000 less
Annual Asthma
cases

PHARMACIES AS CIRCULAR SUPPLIERS

Widening the Scope of Pharmacy Enterprise

The #Remasked demonstrator was a circular economy projects based in Trafford, South Manchester. It ran from November 2021 to March 2022. Creating a new avenue for Alphabet Pharmacy to help prove circular economies within Greater Manchester's Integrated Care System.

The project concentrated on a number of different aims:

- Community capture, recycling & remanufacturing of pharmaceutical and care plastics
- Raise awareness of circular economies amongst the general public and health workers
- Research the profile of South Manchester's recapturable plastic care waste
- Deliver a green report for participants
- Inform a Automedi's wider catalogue by introducing other products





WHY FACEMASKS?

Masks are a versatile raw material worth more in parts than as a mask.

When separated, they create usable raw materials sellable for manufacturers and business creating:

- Hairbands
- Bracelets
- Cable twists
- Bread ties

Together with 5 grammes of Polypropylene that #Remasked mixes with inhaler mouthpieces & medicine pots for the perfect recipe of material for extrusion of many different products, parts and accessories for home improvement, social housing, maintenance and more!



OPERATING MODEL

RECLAIMER SUBSCRIPTION

The Reclaimer service subscription included an on-site additive manufacturing device with a backing collect, reclaim and recycle service.

A total of 8 active outreach bin locations were included in the research subscription and the project operated for 2.5 months between late January and mid-March. Collecting plastics and manufacturing goods for sale.



#REMASKED: CIRCULAR PHARMAPLASTICS

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



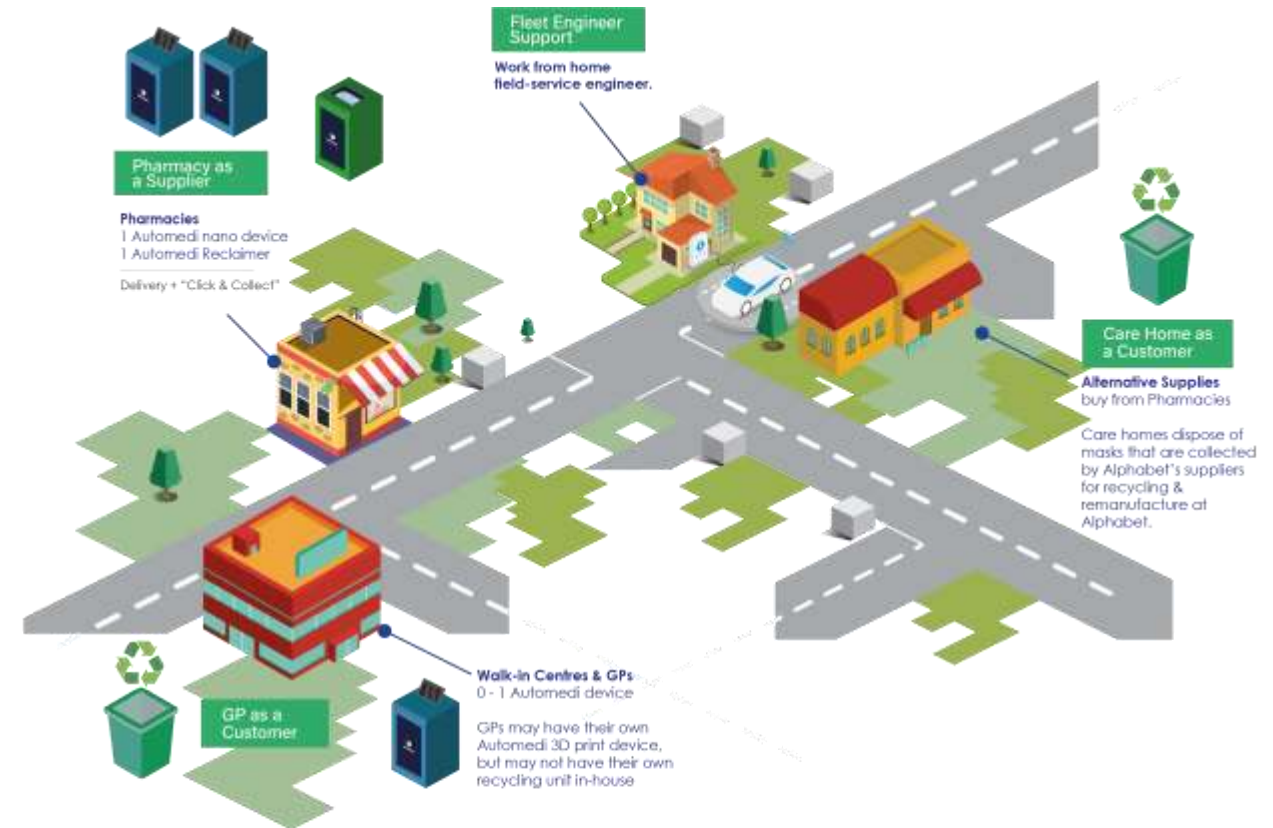
SOCIAL VALUE: REACHING BEYOND

PLUG-N-PLAY CIRCULARITY

Climate change does not respect the borders of constitution, legislation, contract nor economy. It crosses the verticals of advanced economies which combine silos of manufacturing, transportation and disposal. Healthcare then suffers recurrent demand from its climate pollution, anywhere in the world.

Circular Economies provide nonlinear solutions to these nonlinear climate problems with sustainable, cost-effective, recycling of pharmacy and social care plastics.

Microeconomic clusters, like #Remasked, align to 15-minute communities for fast, always available, contingent supply across all of the public, private and voluntary sectors. Lowering lead times, increasing resilience, and creating socio-economic value from NHS waste. Removing the need for new virgin plastic products across all of society.

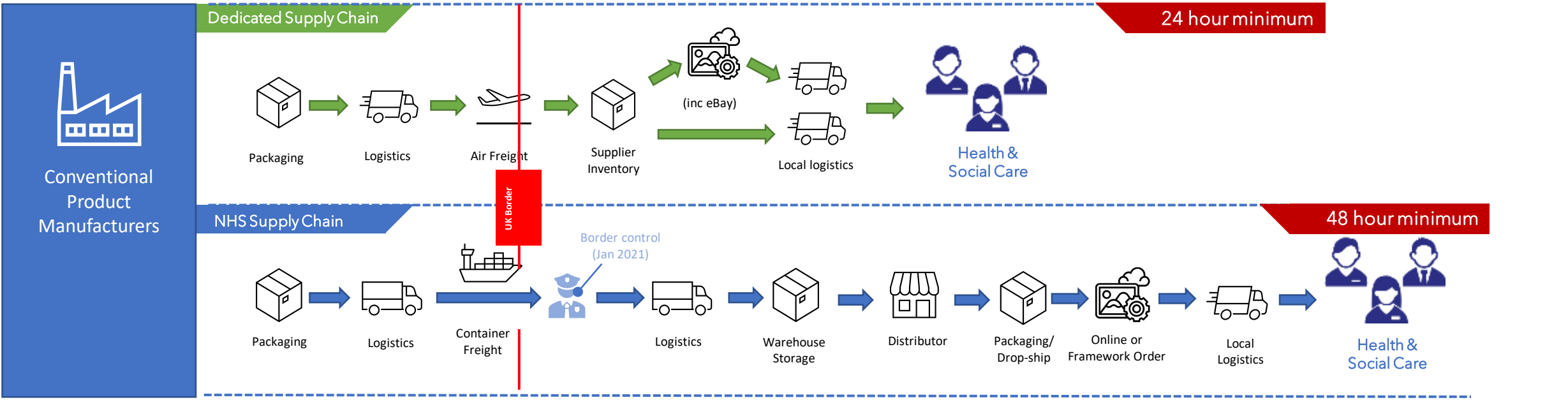
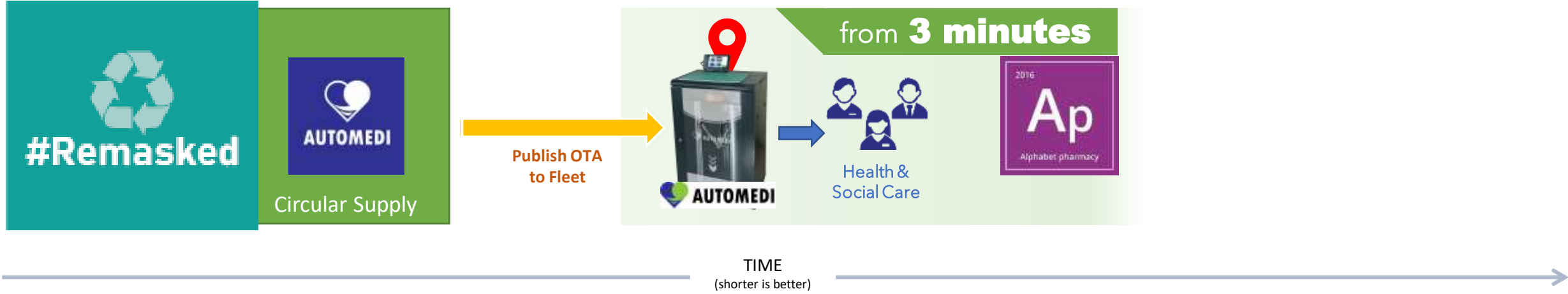


Pharmacy Supplies Circular Economy



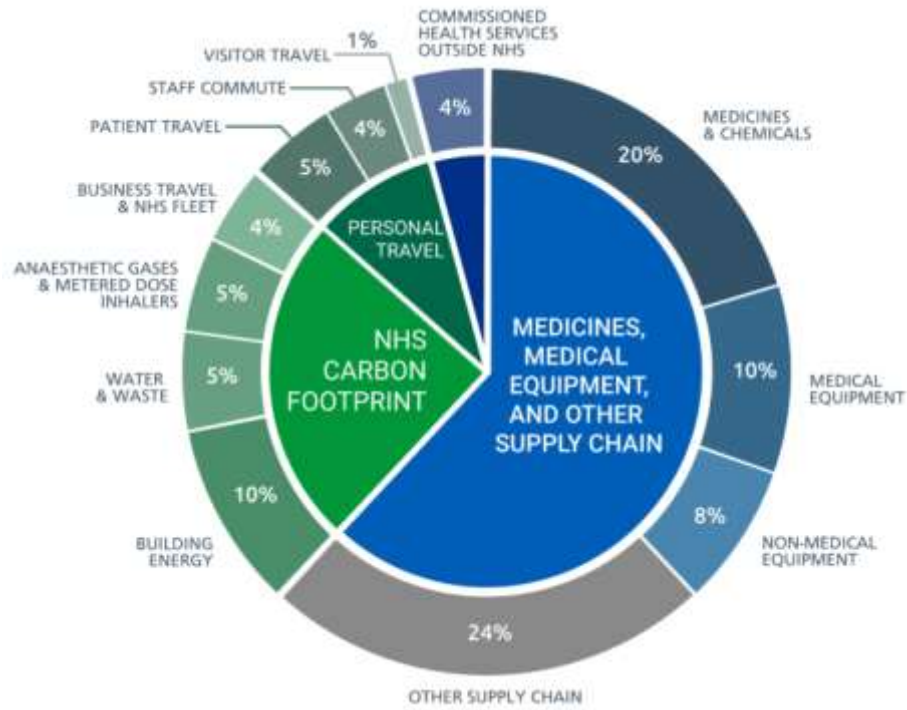
Supply: Every Moving Part Carries Risk

Circularity bypasses steps & mitigates risks by proxy



#NO SILO

Direct, System Wide, Cost-effective & Complete



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 system wide change from within pharmacy and is as close to an ideal solution as possible. Providing a way for communities to help local authorities deliver on their net zero commitments and delivers multi-agency public health benefit, social good, education, employment and cost effective production, that meets all of the NHS sustainability demands.

“Made in Stretford by Alphabet Pharmacy”

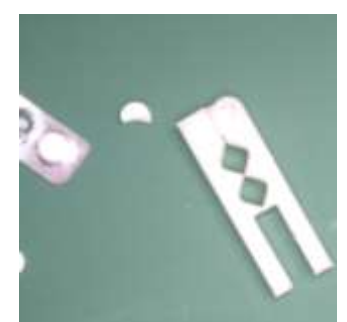
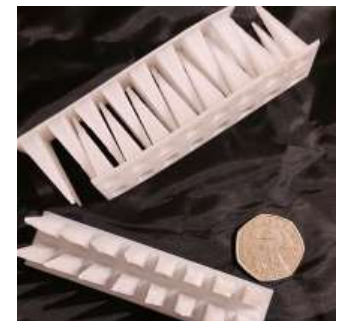
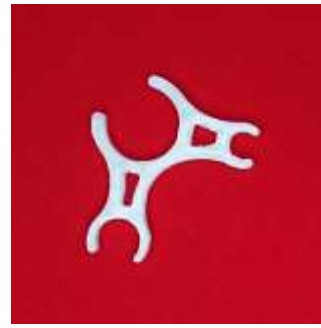
UPCYCLED SUPPLY & ACCESSORIES

Utilising hyper-local decentralised manufacturing, delivers performance identically to conventional injection moulding, from 25% less plastic. Meaning captured raw material batches last longer while reducing perpetual carbon dioxide emissions.

Conventional manufacturing uses as much material as the manufacturing process will allow. This is simply because items have to be designed for manufacture and until recently, advanced manufacturing techniques were not widespread. Meaning you had to design the products in a way that could be made by conventional machines.

Additive manufacturing, commonly known as 3D printing, shifts the paradigm. Allowing manufacturers to design products with walls and structures that were never possible before.

10 different innovations are used to create equipment using as little plastic as possible for manufacture, while overengineering for purpose.



“Made in Stretford by Alphabet Pharmacy”

UPCYCLED SUPPLY & ACCESSORIES

Traditional Polypropylene facemasks become equipment, fixtures & fittings simultaneously saves

- **80%** on the cost of new equipment
- **£70 - £3,000/tonne** 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 not required)
Embodied CO₂: 3g
Disposal CO₂: 2g

MADE FOR PENNIES

Facilities & Electrical



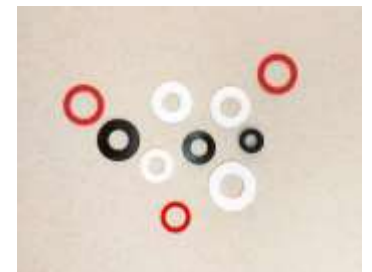
Mask Comfort
(e.g. ear savers)



Catering Storage & Clips



Washers & Seals



PLASTIC MASS HARVESTED

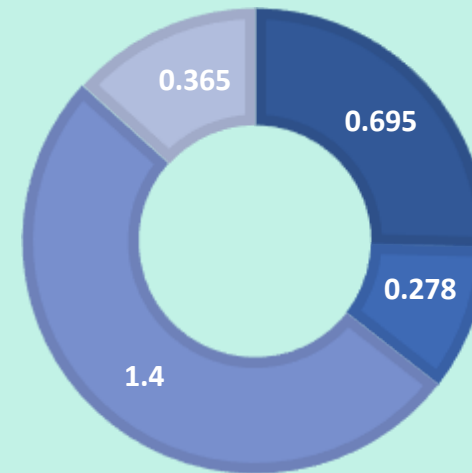


2.738kg

Plastic Mass

(excluding elastomer & metal)

Material Weight
(kg)



- HDPE
- LDPE
- Polypropylene
- Masks (compound)

CARBON EMISSION SAVINGS



10.627 kg

Net Carbon Saving

equivalent saving

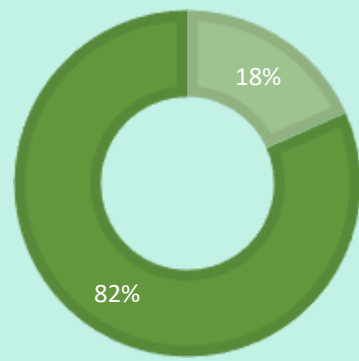


71.57
miles

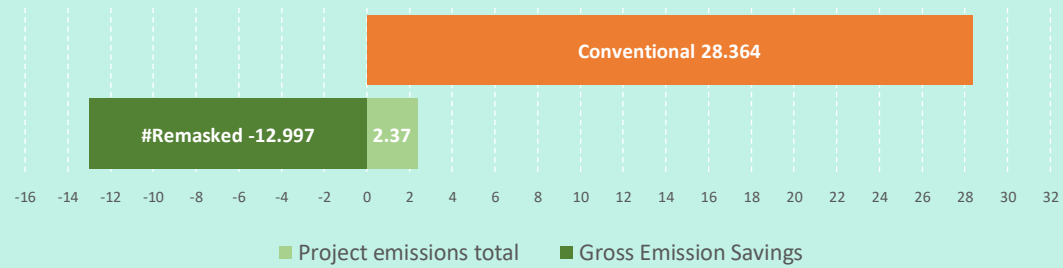


4.2
tree years

CARBON SAVING PROFILE



- Manufacturing & Raw Materials
- Freight & Disposal

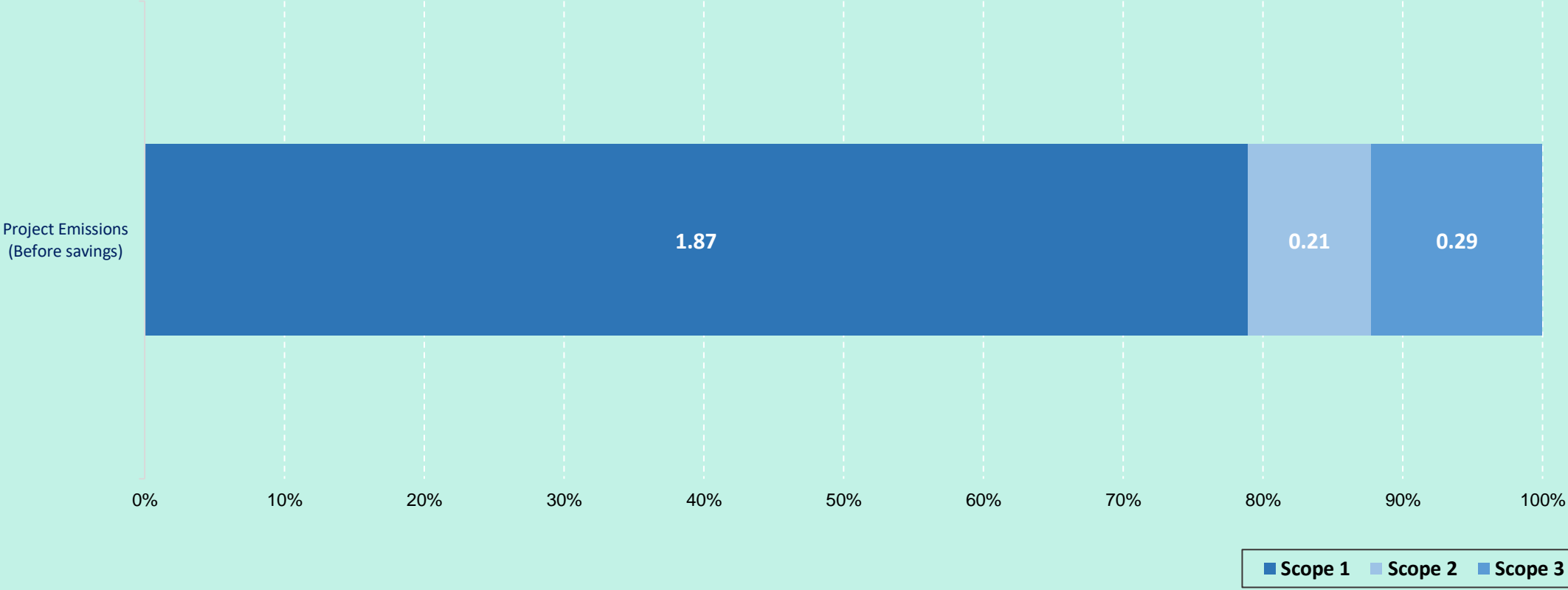


Comparing conventional supply chain v circular plus one replacement cycle

Emissions Comparison

CARBON EMISSION REPORTING

Greenhouse Gas Protocol Emissions by Scope (kg)



ECONOMIC VALUE GENERATED

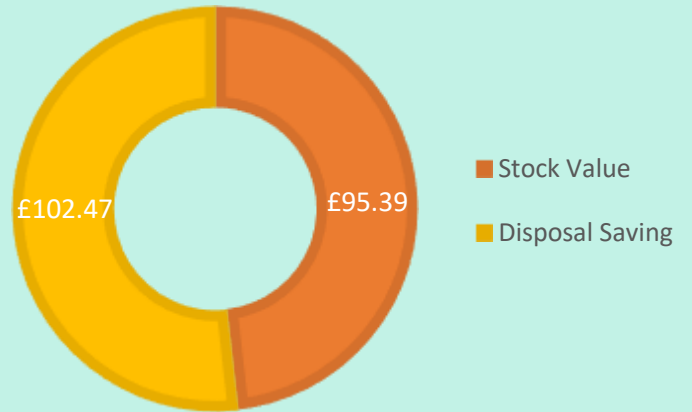


£197.85

Total Value Add

equivalent £72.26/kg

Gross Economic Value Add



Product Selection



HEALTH-ECONOMIC BENEFIT



£0.67 /kg

Respiratory Treatment Savings

**£35.4
million**

Maximum Savings from NHS
hard plastic waste



705kg = 1 overnight patient treatment

www.remasked.org

hello@automedi.co.uk

facebook.com/RemaskedGM

ABOUT #REMASKED

#Remasked is a collaborative circular innovation project delivered on behalf of the Greener NHS North West team by Alphabet Pharmacy and Automedi Limited.

The project examined the role pharmacies would play in a new greener economy, while focusing on the NHS' core aims of eradicating emissions from the service.



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