



Tech Enabled

# CIRCULAR “MICRO” ECONOMIES

(aka “Where there’s muck, there’s brass”)



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CEO Automedi: Climate Technology | Industrial mathematics | Doughnut Economy  
Author: Health-Climate-Economics

# MATERIAL: PERENNIAL PLASTIC PROBLEMS



**340** million  
tonnes  
new plastic rubbish



**10** trillion  
total freight tonne-miles



**8.26** billion  
Transport (t CO<sub>2</sub>e)



**37.1** billion  
Manufacturing (t CO<sub>2</sub>e)



**\$30** trillion  
wasted economic  
potential



**\$1.6**  
trillion  
trade-related  
respiratory disease



**1.185**  
million  
t CO<sub>2</sub>e  
EU Inhaler emissions

Climate to Health-Economics

# HEALTH EMISSIONS: A UNIQUE CHALLENGE

The NHS Carbon Footprint+ is 6% of UK total. Contributing to 36,000 deaths & £345 million in respiratory treatment costs annually.

## DID YOU KNOW?

Embodied CO<sub>2</sub>e in **1kg** plastic:

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

= **11.38kg CO<sub>2</sub>e**

= **15.4p of Care Costs**

Upstream Impact



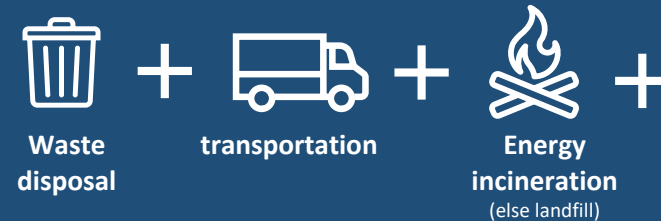
Energy consumption 1.27 Gt CO<sub>2</sub>e industrial emissions (plastics only)



2MtCO<sub>2</sub>e (per factory)

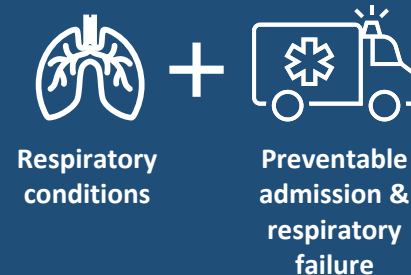
20.1MtCO<sub>2</sub>e (annual)

Downstream Impact



800MtCO<sub>2</sub>e

365.75 tCO<sub>2</sub>e



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

Raw materials

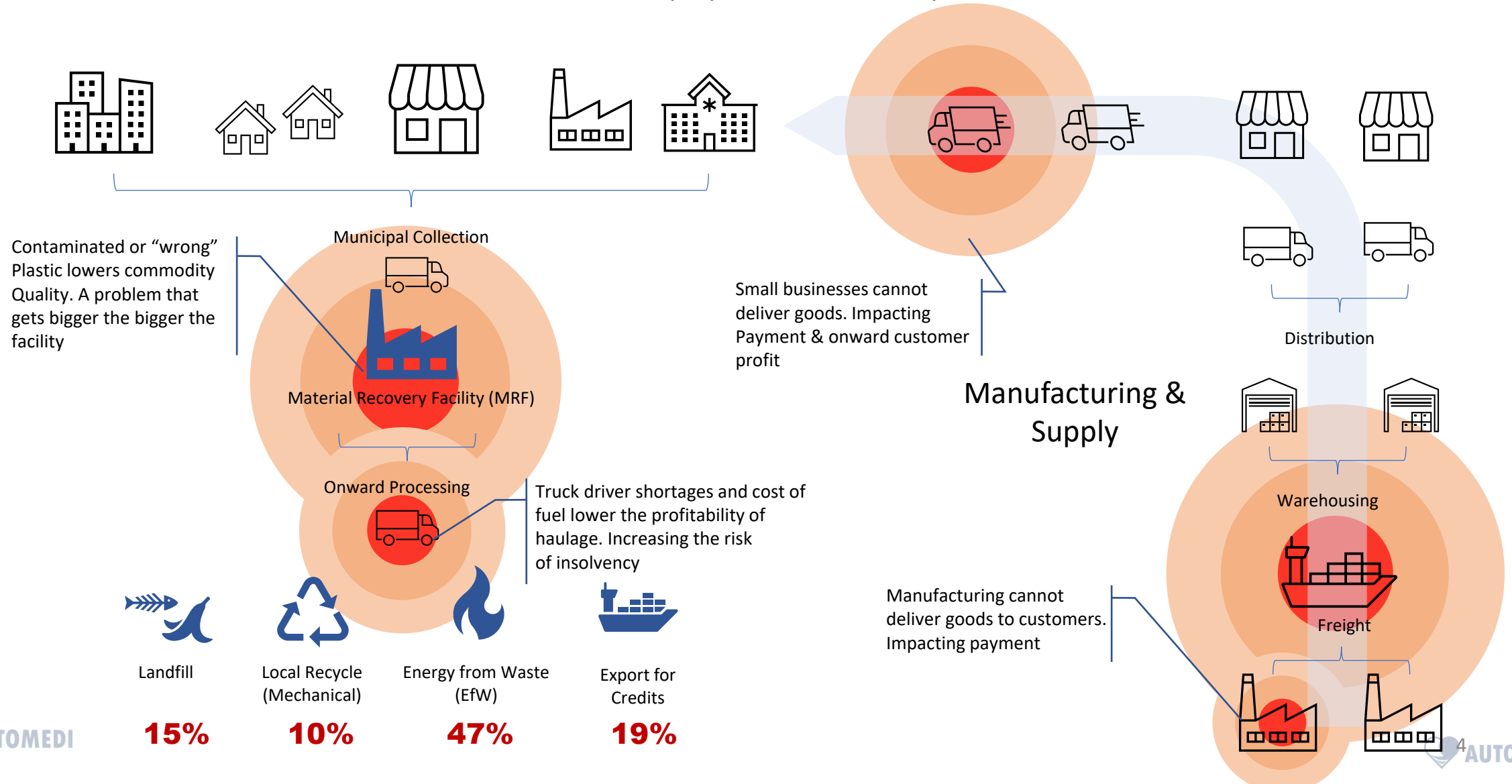
Make & Use

Dispose

Impact

# Risk: Waste + Manufacturing + Supply = Combined Problems

Public services must reduce consumption of natural resources, shorten supply chains AND minimise what isn't reclaimed to deliver Resilience, Equity and Climate Safety



# FORCE BALANCING: SUSTAINABLE PROCUREMENT

## Systemic Health Protection

Example: “14,000 nursing professionals from across the UK confirm that:

- Almost a third of nursing staff treating Covid-19 positive patients not on ventilators report an immediate lack of face and eye protection;
- Only half of nursing staff believe they have enough alcohol hand rub;
- One in ten nurses are relying on face or eye protection they have bought or homemade.”

- Nursing Times, April 2020

## Faster, safer agency & bank onboarding

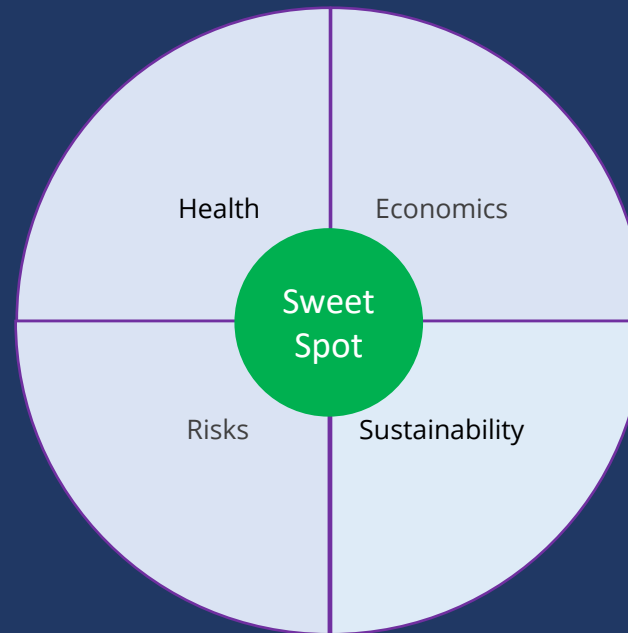
“This crisis is taking the lives of nursing staff, and their colleagues feel they’ve been left exposed. All decision makers involved here need to get an urgent grip on the situation. Nursing staff just want to do their jobs – they must be given protection in order to do so.”

- Nursing Times, April 2020

## Cost-effective Contingent Alternatives

Example: “About 47% of NHS trusts were in the red in 2018/19. The figure was 67% just among acute hospital trusts—which make up the bulk of NHS trusts across England.”

- Full Fact, July 2019



## 17 Sustainable Development Goals & Social Value (PPN06/20)

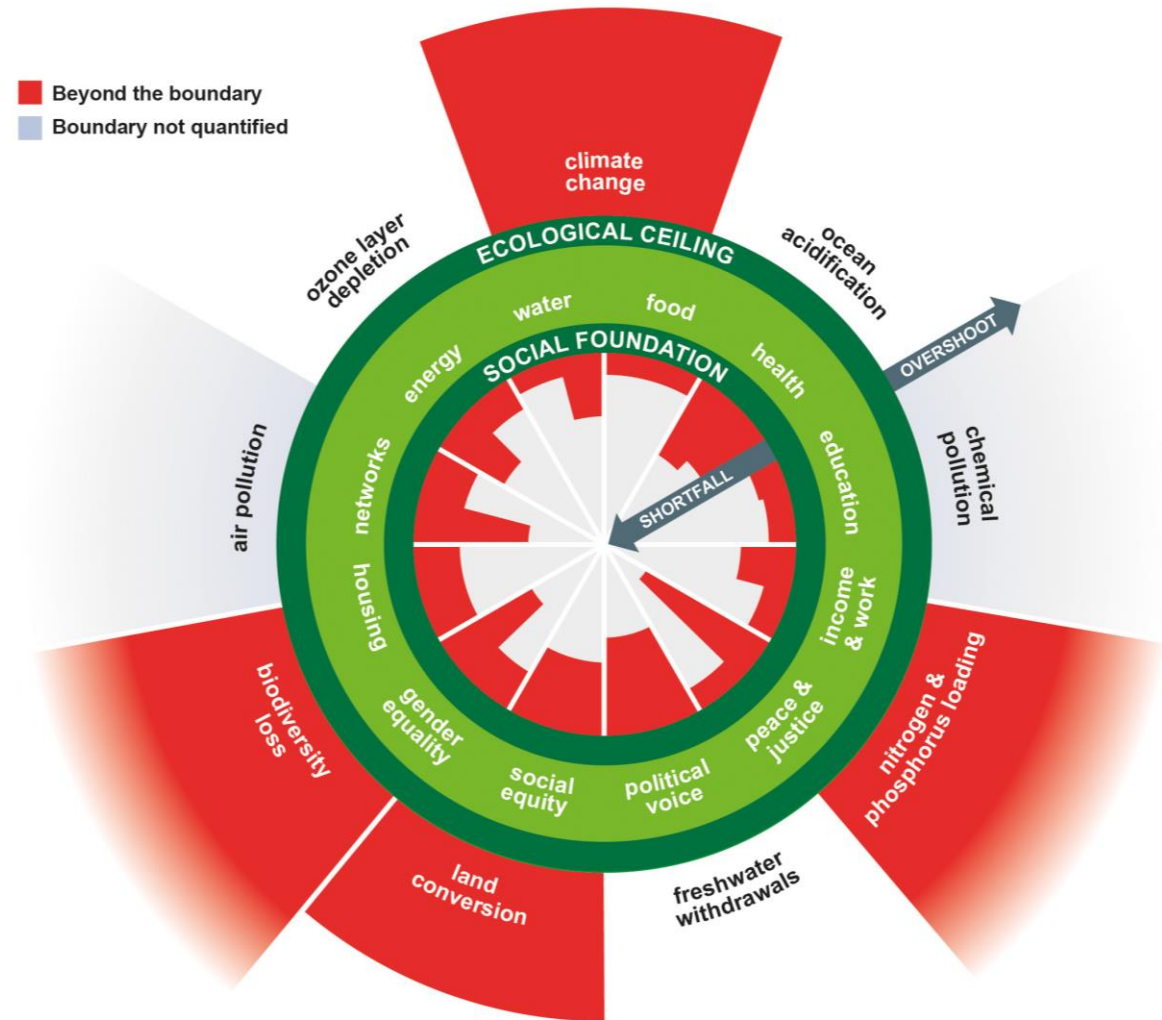
“During my nearly five years as director-general of WHO, high-level policymakers have increasingly recognized that health is central to sustainable development.”

- Dr Gro Harlem Brundtland,  
Former Director General, WHO

## SOCIAL: BALANCING DOUGHNUTS

- **Climate Needs**
- **Society's Need**
- **Organisational Needs**

Cannot be solved with linear thinking.  
It means EVERYTHING must change!



Doughnut economics (Raworth et al) is a tool that creates control limits for human advancement between ecology (upper limit) and social needs (lower limit)

Ref: Raworth K, *A safe and just space for humanity: can we live within the doughnut?*

# SERVICE PROVIDER OBLIGATIONS

## Conditions SC18.1 - SC18.5

The new NHS contract service conditions are a step-change in social value (PPN 06/20). What does the Net Zero NHS plan say about circular economies?

Submissions included a range of ideas that are not currently being implemented. These require further investigation to fully understand their impact:

- For energy generation, suggestions included the installation of fuel cells, biomass boilers and combined heat and power engines that run on hydrogen, developing heat networks and exploring heat generation. A suggestion to invest in batteries designed for storing photovoltaic power has been investigated further.

Under waste, ideas included switching to multi-use equipment where possible, such as reusable sharps bins, and reusing equipment that has been loaned to individuals (eg crutches, wheelchairs or supporting frames). Applying circular economy principles to waste management was also proposed, by fixing, rather than replacing, broken equipment (non-clinical) such as chairs, flooring and office equipment.

### Travel and transport

Submissions related to avoiding travel and reducing the emissions from vehicles where travel is still required.

## SERVICE CONDITION OBLIGATIONS



Maximise Environmental Protection



Maintain A Green Plan & Report Progress



Quantify & Report Impact



Reduce Fleet & Building Emissions



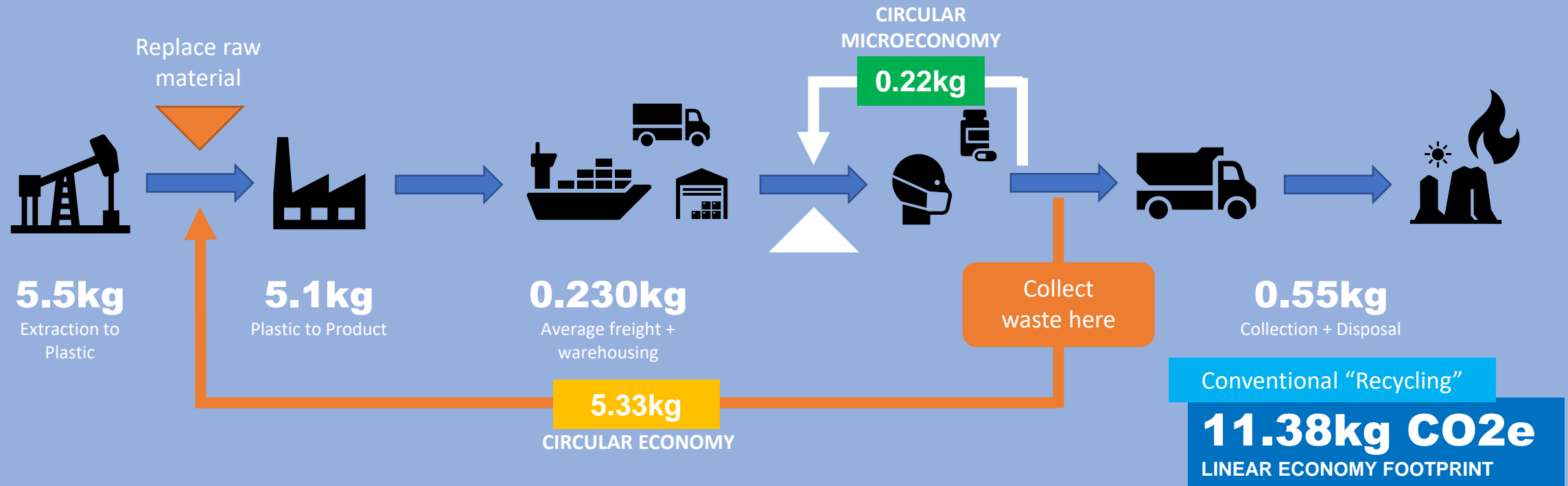
Eradicate Single Use Plastics



Have Regard to Social Good

# CIRCULAR v LINEAR ECONOMIES

Comparative Analysis of average carbon footprint of **1kg of plastic**





# CIRCULAR MICRO-ECONOMY PLATFORMS



## Grind

Grind is the first step in recycling plastics it is granulated plastic in chunks of 5 mm x 5 mm.

**Market value:** £600/tonne



## Filament

Filament is used both in 3D printing and to pelletise.

**Market value:** £17,000/tonne



## Product

Product is the most valuable output. Optimised for plastic use and price.

**Market value:** £96,000/tonne

# CRADLE-TO-CRADLE CLUSTERS



## Unified cradle-to-cradle circularity

All-in-one circular microeconomies also:

- ✓ Automate data collection
- ✓ Fully transparent reporting
- ✓ Eradicates waste disposal, logistics & freight
- ✓ No export or transfer boundaries

# CASE STUDY #REMASKED

## #REMASKED



Pill Splitter

Reusable  
Compliance Pill  
Pod

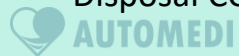
Tweezers

**✘ Classical Buy**

Cost: £3.18  
(inc delivery & VAT)  
Embodied CO<sub>2</sub>: 61g  
Disposal CO<sub>2</sub>: 17g

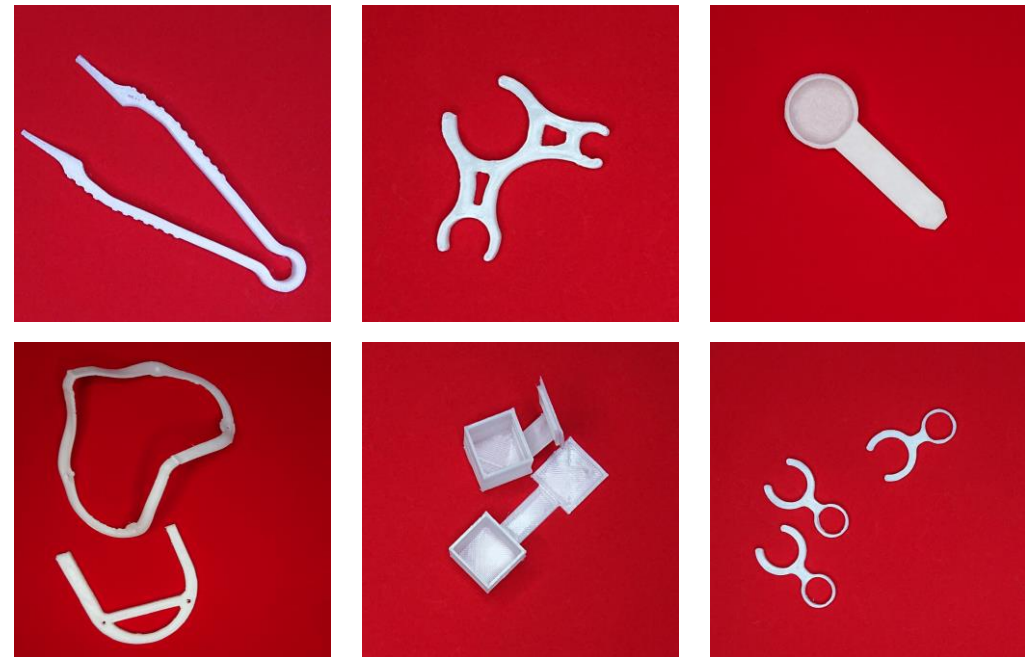
**✔ via Automedi**

Cost: £0.14  
(delivery not required)  
Embodied CO<sub>2</sub>: 3g  
Disposal CO<sub>2</sub>: 2g



Products in as little as  
**7 minutes**

"Automedi helped  
strengthen working  
relationships with other  
healthcare professionals,  
making Alphabet Pharmacy a  
hub of primary care"  
★★★★★  
Alpa Ghelani,  
Superintendent Pharmacist & Owner,  
Alphabet Pharmacy



# ENVIRO-ECONOMIC SWEETSPOT

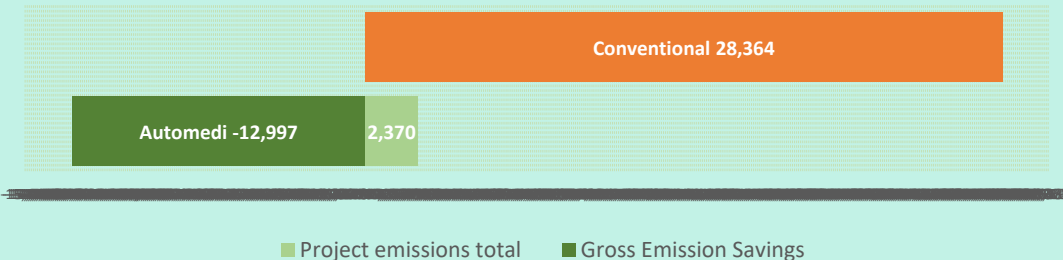
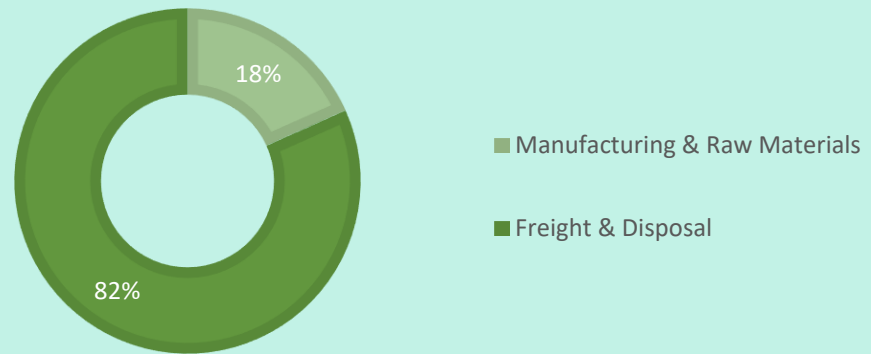


# £72,260

## Gross Revenue

(typical per tonne)  
Equivalent

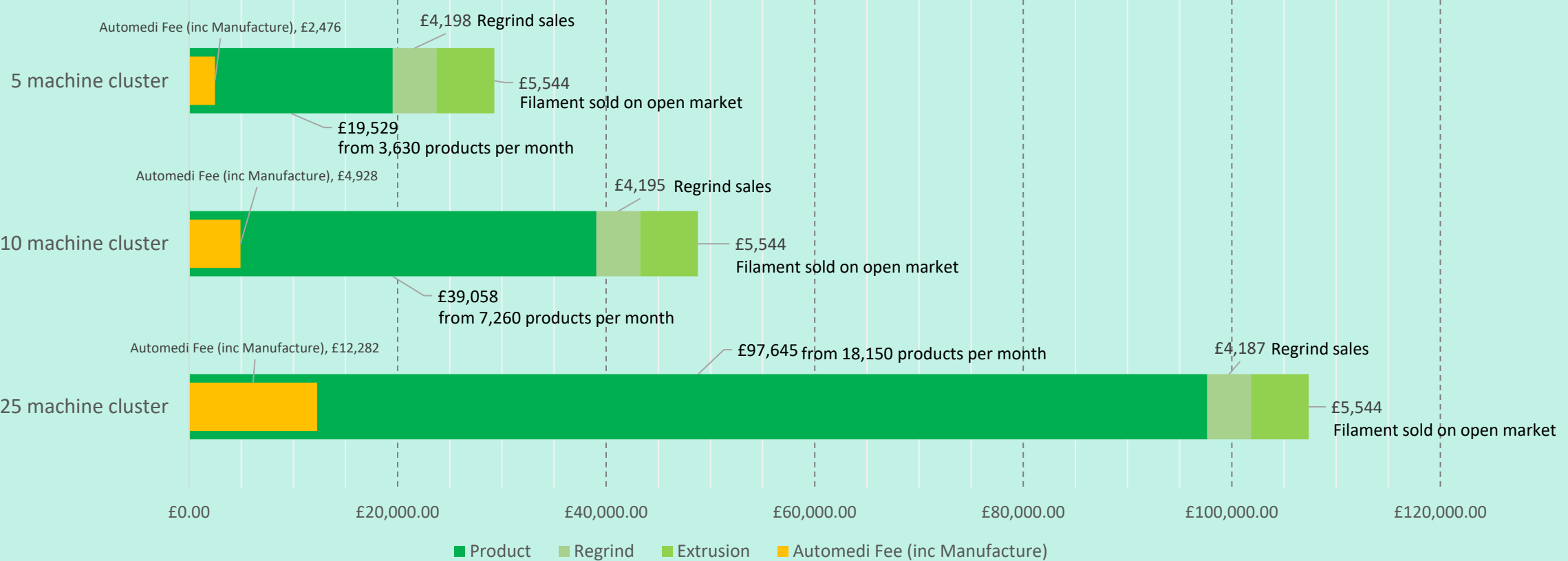
### CARBON SAVING PROFILE



Comparing conventional supply chain v circular plus one replacement cycle  
Emissions Comparison

# GROSS MONTHLY ECONOMIC ADVANTAGE

Gross Revenue per tonne-month (our costs in yellow)



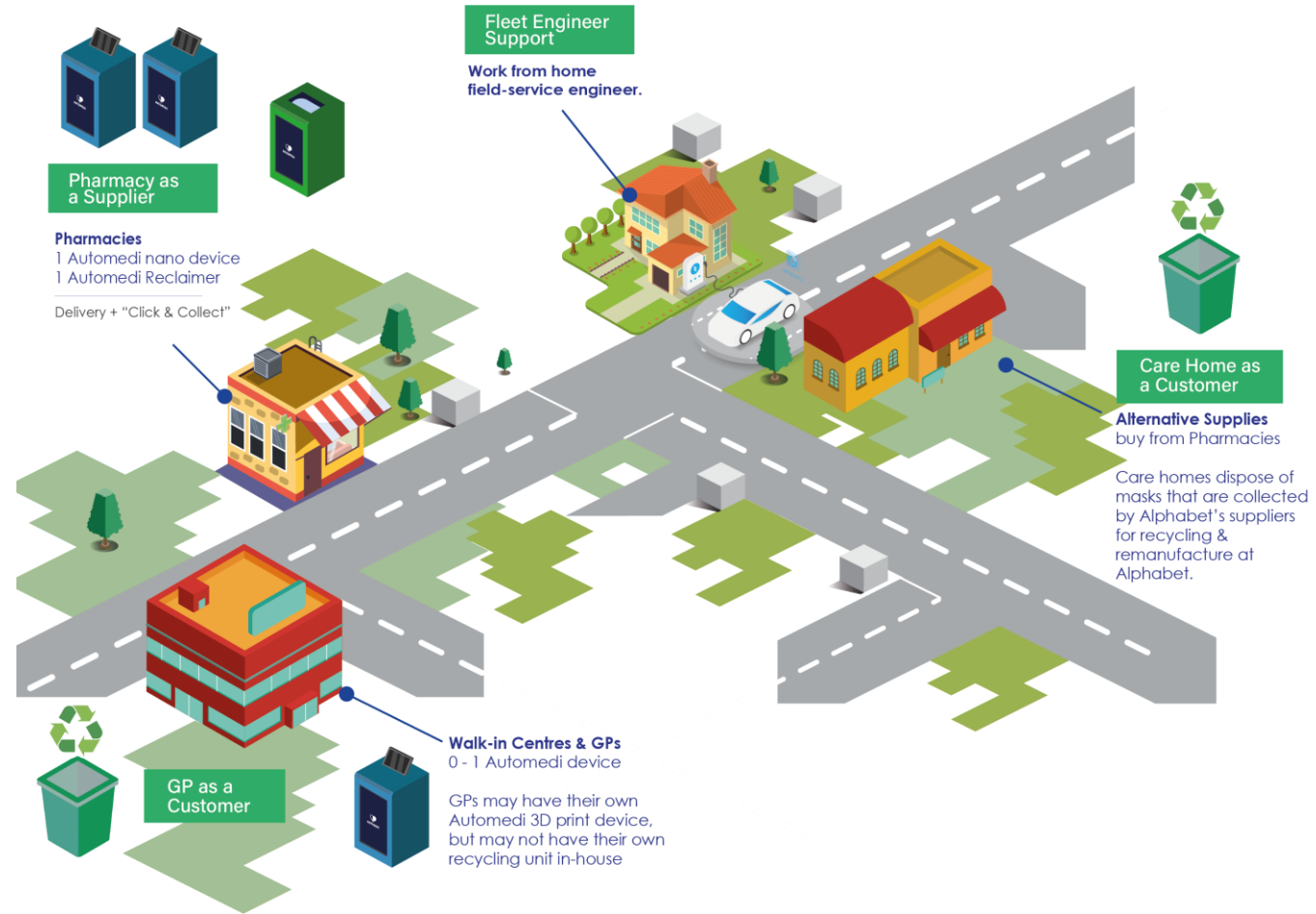
Working Assumptions: Average illustration only. Customer able to sell products. Circularity clusters (grind, extrude and manufacture) working on 8 hour days. Manufacturing is able to operate 24 hours. Conventional commodity products compared with transportation included. Products exist at multiple stages. Grind-to-extrusion ratio of 7:3 to be sold on the open market. Consumed product returned directly to Automedi does not require another £1,500 fee per tonne, but client can obtain further revenue from that material via production. Automedi acting in capacity of waste broker only to enable onward sale of grind or extrusion.

# Community = Factory

Your investment democratizes the supply chain for jobs, skills, products, and support for billions of people across the globe excluded from basic infrastructure, health and care supplies.

To do that, needs new infrastructure that enables hyper-distributed circularity. Infrastructure we have built from scratch.

Levelling up can only happen when we all go together. Automedi makes that happen clean.



# The End



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