

Research to address single use plastic use, waste and emissions

Introduction:

Welsh Public Sector has a commitment to achieve Net Zero emissions by 2030.

The NHS is the largest source of emissions in the Welsh Public Sector.

Public Health Wales is one of 11 organisations that makes up NHS Wales and comprises 14 microbiology service sites.

Public Health Wales’ Decarbonisation Action Plan, includes an action to review the opportunities to use reusable equipment within our Microbiology labs.

Aim:

To review the single use plastic, high waste items and personal protective equipment used in Public Health Wales’ Microbiology laboratories.

Objectives:

Research suitable alternative materials and associated emissions.

Identify where emissions can and cannot be reduced in Microbiology laboratories.

Methodology:

Methods to gather data and undertake research included:

Direct engagement with staff

Interviews with emerging solution providers

Literature review of current solutions Analysis of procurement data

Life cycle assessments undertaken for the top 16 items

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Results:

A reduction in emissions from single use laboratory consumables is possible across the board.

93% of laboratory staff wanted to decrease single use plastic usage.

Life cycle assessments highlighted a potential 75% reduction in emissions.



This table shows the four highest carbon emission impact items

Product	Quantity	CO2e (tonnes)	Waste (tonnes) (Product only)	Cost Impacts
Agar plates (Petri dishes)	1,942,773	189	30	£493,144
Microbank vials	24,720	99	16	£493,144
Sodium hydroxide bottles	13,500	54	9	£493,144
Pipettes	3,478,392	44	9	£493,144

This table shows the top 5 proposed actions/ switches and savings in CO₂e impact rank order

Material/ Product	Actions	CO2e (tonnes) Savings	Waste Savings (est.%)	Status/ Comment
Single Use Plastics (16 top by procurement)	Mechanical recycling and remanufacture	231	>90% estimated	Potential Supplier (LabCycle) solution 2024
Single Use Plastics	Manufacture utilising renewable energy	105	0	Material and product manufacturers need to action
Single Use Plastics	Local manufacture and transport	30	0	Need to leverage and incentivise local industry
Paper	Reduce paper use by 25%	8	25% (if not recycled)	Achievable according to stakeholders
Disposable Masks	Reusable Type IIR masks to displace disposables	4	80% (due to loss during use)	Higher cost implications



Conclusions:

The results can be shared widely within NHS Wales to support individual laboratories to reduce their emissions and single us plastic use.

Single use waste disposal in laboratories is an area that needs more research.

This project presented a review of different technologies for calculating and disposing of single use waste items.



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