



MEDCITY
LONDON

LONDON
& PARTNERS

December 2025

MedCity report:

Setting up for environmental sustainability
in life sciences labs for small and
medium enterprises

**A practical guide to establishing
environmental sustainability showcasing
best practices in London**



CONTENTS

03 EXECUTIVE SUMMARY

04 INTRODUCTION

- 05.** Carbon emissions in biopharmaceuticals
- 06.** Drivers for more environmentally sustainable practices: NHS sustainability requirements

09 WHAT CAN YOUR COMPANY DO NOW?

- 10.** Benchmarking
- 11.** Energy reduction
- 15.** Consumables Waste Management
 - 16.** Plastics
 - 21.** Environmental waste
- 22.** Non-Consumables Waste Management
 - 22.** Water Consumption
 - 24.** Equipment reuse
- 25.** Corporate influence
 - 25.** Laboratory buildings
 - 27.** Procurement

31 WHY ARE LONDON'S LIFE SCIENCES SMES INVESTING IN SUSTAINABLE PRACTICES?

- 31.** An interview with Mia Funkino, Scientist, Full Circle Labs
- 33.** An interview with Nicholas Purcell, CEO of Purcell Global Ltd

35 FRAMEWORKS TO FOLLOW

- 35.** Choosing your framework
- 37.** Summary of key tactics in this report
- 38.** Acknowledgements

39 RESOURCES

- 39.** ISO 14001 lab sustainability checklist
- 40.** ISO 50001 in a lab environment checklist
- 41.** Tenant checklist for lab providers to future proof for sustainability
- 43.** Download signage to print for labs

Executive summary

Traditionally, research and development is a highly resource-intensive activity, with a high energy, water, and virgin plastic burden. Reducing emissions and waste not only contributes to environmental sustainability, but often reduces running costs for life sciences laboratories. As an industry, biopharmaceutical accounted for **5% of global carbon emissions** in 2023 through its energy-intensive operations and complex global supply chains. Whilst larger biopharmaceutical companies, according to My Green Lab, are demonstrating that impactful change is achievable across the sector, small and medium-sized enterprises (SMEs) sit outside of this trend^[14].

SMEs make up **over 77% of the UK's life sciences sites**^[3]. They are facing increasing pressure to adopt sustainable practices to reduce their carbon footprint, especially as major purchasers like the NHS commit to net zero by 2040 and research funders such as the Wellcome Trust^[16], and Cancer Research UK^[17] are adding sustainability requirements to their grant applications.

MedCity research with life sciences organisations revealed that while three out of four have set sustainability goals, many highlighted that constraints related to cost, time and resources hinder their progress. Notably, 55% of respondents reported that no viable solutions currently exist for their most pressing laboratory sustainability challenges.

This report offers a summary of practical resources and case studies to help lab-based SMEs in London implement cost-effective and impactful environmental sustainability measures in their labs and operations.

Key opportunity areas include:

- **Cost-effective modifications** that reduce energy, water and gas usage or improve efficiency.
- **Waste management strategies** that focus on recycling to reduce environmental impact.
- **Building a sustainable culture** with leadership buy-in and investment to empower teams to lead sustainability from within.

By leveraging the resources and case studies supplied within this report, businesses can establish leaner and more sustainable lab practices while enhancing their own resilience and competitiveness.

Written by [Ella Churchill](#), Insights Manager - Life Sciences, MedCity



As scientists, it would be ignorant of us to turn a blind eye to the urgent threat our natural environment is facing. Sustainability should be embedded into lab operations from day one. The earlier businesses begin considering their environmental impact, the easier it is to build sustainable practices into their operations, supply chains, and culture.

Mia Fukino, Scientist, Full Circle Labs
[Read the full interview](#)

Introduction

This report highlights **strategies to help life science SMEs to adopt more sustainable laboratory practices**. The actions covered range from small changes you can apply today, to longer-term projects for companies to invest in for the future. These suggestions have been guided by the results of our June 2025 survey with 53 life sciences organisations who were asked about their experience of environmental sustainability and the key challenges within the sector.

The results showed that **three quarters of survey participants had sustainability goals**, but challenges to implementing sustainable practices included perceived cost, followed closely by time and resources. A lack of expertise, supply chain constraints, lack of suitable solutions, and a lack of guidance were also cited as barriers to adoption.

This survey was supplemented by interviews with industry experts to develop case studies to showcase the best practices in London. Experts from Imperial, King's College London, UCL LEAF, and industry bodies have reviewed and advised on the final report, and have engaged in interviews.



[What can your company do now?](#)

About London & Partners

London & Partners is dedicated to fostering economic growth that is resilient, sustainable, and inclusive and our MedCity team serves as a unifying voice for life sciences in London, amplifying the city's strengths, providing valuable information and resources to businesses and entrepreneurs, and supporting the ecosystem's growth.

Introduction

The biopharmaceutical industry has a significant carbon footprint, reaching **5% of the total global carbon impact in 2022** [2]. **My Green Lab**, a non-profit organisation dedicated to supporting sustainability in scientific research, reported a **reduction in the sector’s carbon intensity in 2023** [2] as the largest companies were reported to have focused on significant sustainability initiatives to reduce their emissions. This positive shift indicates that the industry can curb emissions, but action is still needed.

How are emissions calculated?

Emissions produced by a company are typically categorised into three scopes [2]. **Scope 1 and 2 emissions** result from direct company operations such as facilities, company transport and electricity purchased, while scope 3 emissions are produced by the supply chain and product waste management. **Scope 3 emissions** are generally harder, though not impossible, to influence, and are important for companies to track with the aim to reduce scope 3 emissions in the long term.

Upstream emissions (scope 3 – indirect)	Direct operational emissions (scope 1 and 2)	Downstream emissions (scope 3 – indirect)
These are emissions from activities before the product reaches the company, often outside the organisation’s direct control.	These refer to emissions from owned or controlled sources (scope 1) and purchased energy (scope 2).	These occur after the product leaves the company .
Key sources include: <ul style="list-style-type: none"> Raw material extraction and synthesis (e.g. active pharmaceutical ingredients, excipients, solvents). Supply chain logistics (global transportation of inputs). Contract manufacturing organisations (CMOs). Packaging material production. Capital equipment manufacturing (e.g. freezers, fermenters, analytical instruments). Purchased goods and services (e.g. single-use plastics, lab consumables). 	Key contributors: <ul style="list-style-type: none"> Laboratories and cleanrooms – high energy use for HVAC, fume hoods, ultra-low temperature freezers. Manufacturing plants – fermentation, purification, sterilisation, etc. On-site gas and fuel use (e.g. boilers, backup generators). Facility energy use (e.g. lighting, climate control, IT systems). 	Key contributors: <ul style="list-style-type: none"> Cold chain logistics and distribution. Product use phase (e.g. energy required for storage, use in clinical settings, gas emissions through use). Disposal and incineration of medical waste (e.g. syringes, packaging, expired drugs). End-of-life treatment (landfill, recycling, incineration).
Example: Emissions from producing and shipping single-use bioreactor bags or sterile filters.	Example: A GMP facility may consume several times more energy per square metre than a standard office building.	Example: Injectable biologics requiring constant refrigeration until use contribute to downstream emissions via cold storage and logistics.

Table 2: Description of scopes 1 to 3 in biopharmaceuticals.

The largest proportion of biopharmaceutical emissions come from scope 3, with My Green Lab reporting that **71% emissions are derived from the healthcare supply chain** [2]. They suggest that R&D-intensive early-stage businesses can immediately impact scope 1 and 2 emissions by focusing on addressing onsite energy, water and waste management and by experimental design as the first step towards becoming more sustainable.



Drivers for more environmentally sustainable practices: NHS sustainability requirements

The NHS is the main buyer for biopharmaceutical and medical technology businesses in the UK, and **more than 25% of NHS emissions come from the use of medicines**^[8]. The NHS is implementing significant changes to its procurement requirements to support the commitment to become the **world's first net zero national health service by 2040** and aims to leverage its purchasing power to drive environmental improvements (figure 6). Therefore, **NHS requirements are a major driver of environmentally sustainable activities** for the life sciences industry.

NHS NetZero roadmap^[10]:

2022	10% net zero weighting on procurements
All NHS procurements include a minimum 10% net zero and social value weighting , applied via the Evergreen Assessment for NHS England Medicines tenders	
2023	Scope 1-3 carbon reduction plan
All new contracts above £5m per annum require suppliers to publish a carbon reduction plan for their UK scope 1 & 2 emissions, and subset of scope 3 emissions	
2024	All suppliers required to plan
NHS proportionately extended the carbon reduction plan requirements to cover all new procurements	
2027	All suppliers required to report emissions and publish scope 1-3 plan
All suppliers required to publicly report targets, emissions , and publish a carbon reduction plan for global emissions aligned to NHS net zero target for scope 1-3 emissions	
2028	Carbon footprinting of all individual products
Requirements will be in place to publish a carbon footprinting of individual products supplied to the NHS	
2030	Ongoing monitoring through Evergreen assessment
Contract awards will be dependent on suppliers providing published reports on sustainability progress and continued reporting on emissions through the NHS Evergreen Assessment	

Figure 6: NHS Net Zero Roadmap.^[10]

The NHS goal for net zero means companies aiming to align with these ambitions should fully commit to maximal emission reduction with carbon capture only used to absorb the remaining unavoidable emissions, which is usually advised to be **no more than 10% of total emissions**.

Therefore, **companies should focus on cutting emissions** at the source by:

- Improving energy efficiency
- Switching to renewable power
- Reducing supply chain emissions
- Eliminating unnecessary waste



Introduction

The current view of sustainability in life sciences labs

Through our online survey with **53 life sciences** stakeholders in June 2025 the results showed that **three quarters** of survey participants **had sustainability goals, 20% had goals in development**, and just **4% reported no goals**.

Below is a summary of the survey respondent company profiles.

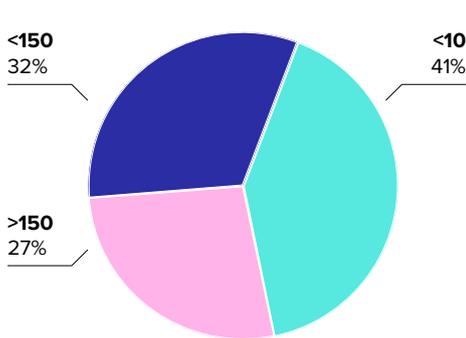


Figure 1: Number of employees in company.

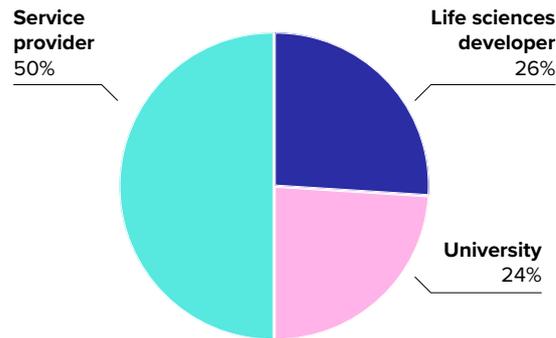
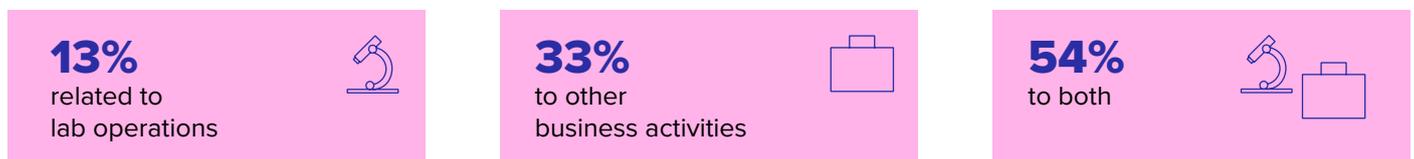


Figure 2: What the company does.

Of those, **80% were currently practicing sustainability initiatives** in their business, the focus for just over half of participants was on both lab operations and other business activities.



When asked about the importance of environmental sustainability, a quarter of SMEs surveyed said that it was core to their business and **67% said it was important or somewhat important**.

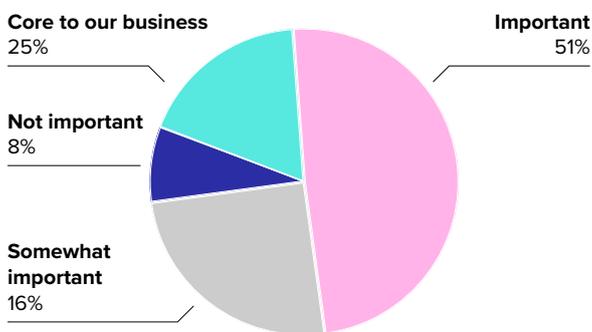


Figure 4: Importance of environmental sustainability to the respondent's.

Introduction

Overall **cost was the biggest challenge** to implementing sustainable practices according to the respondents. This was followed closely by time and resources. In third place was a lack of expertise, followed by supply chain constraints, lack of suitable solutions and a lack of guidance.

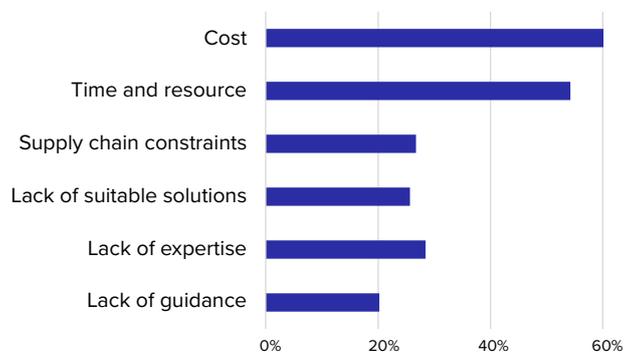


Figure 3: Challenges in sustainability for labs

A lack of sufficient support was felt by the majority (**80%**) of respondents and many respondents (**55%**) said that there were no viable solution to their biggest sustainability concerns.

When survey respondents were asked to prioritise the key challenges they faced in the lab, the **top concern was minimising energy consumption**. This was followed by the need to reduce single-use plastics, improve waste recycling, manage wastewater more effectively, and enhance local product sourcing.

Rank	Challenge
1	Minimising energy consumption
2	Reducing single-use plastics
3	Improving waste recycling
4	Improving waste water management
5	Improving local product sourcing

Table 1: The order of priority ranking of key challenges in environmental sustainability in the lab from survey respondents.

To help address these challenges faced by SMEs this report offers case studies and recommended approaches to improving lab sustainability, alongside indicators of time, cost and ease, so that companies can see some impacts immediately, and continue to make more resource-intensive long-term changes.

[What can your company do now?](#)

What can your company do now?

The matrix below allows you to explore case studies and key tactics to reduce carbon emissions, manage waste, and improve sustainable practice. The cost, ease, and impact of each tactic has been gauged based on outcomes from case studies and consultation with industry experts, and should be used as a guide only.

Key:

Cost saving Ease Impact £ Cost

Challenge	Tactic	Cost	Ease	Impact
Benchmarking	Establish baseline	£££		
Energy Reduction	LED lights	££ +		
	HVAC	£££ +		
	Freezer challenge			
	Equipment turn off			
Consumables Waste Management	Waste segregation	£ +		
	Reduce single-use plastics			
	Recycle single-use plastics	£		
	Take-back schemes	£		
Non-Consumables Waste Management	Low-flow aerators	£ +		
	Finders	£ +		
	Deionised water use	££ +		
	Autoclave coolers	£££		
	Vacuum pumps	££		
	Equipment recycling	Profit		
	Solvents choice	£		
	Gas generator and gas choice	££ +		
Corporate Influence	Building choice	£££££		
	Inventory management	£ +		
	Procurement	£		
	Biodiversity Action	£		
	Training & Ownership	£		
	Carbon Offsetting	££		

Table 3: MedCity matrix on laboratory interventions to increase environmental sustainability.

The case studies highlighted in this section showcase innovations and, where possible, data-driven benefits of sustainable practices in laboratories. There are many more excellent examples of sustainable initiatives. Here, MedCity have highlighted those that we are aware of, alongside a selection of free and paid-for options for service provision. We are not affiliated with any commercial organisations referenced, but have provided these as practical examples based on recommendations from SMEs.

Benchmarking

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
- References
- Download and print the laboratory signage

Before any meaningful progress can be made on reducing environmental impact, it's essential to first **benchmark and understand your baseline emissions**.

Benchmarking allows organisations to **identify the most carbon-intensive areas** of their operations, focus on high-impact interventions, set realistic, data-driven targets, and track financial and carbon savings as a result. It also provides a foundation for tracking progress over time, engaging staff with measurable goals and aligning with recognised frameworks such as [My Green Lab](#), [ISO 14001](#), [LEAF](#), [UN Race to Zero](#), or other net zero frameworks.

Assessment can be done through free tools such as the [Business Climate Hub's free carbon footprint calculators](#), and through specialised life sciences and laboratory assessment consultancies.

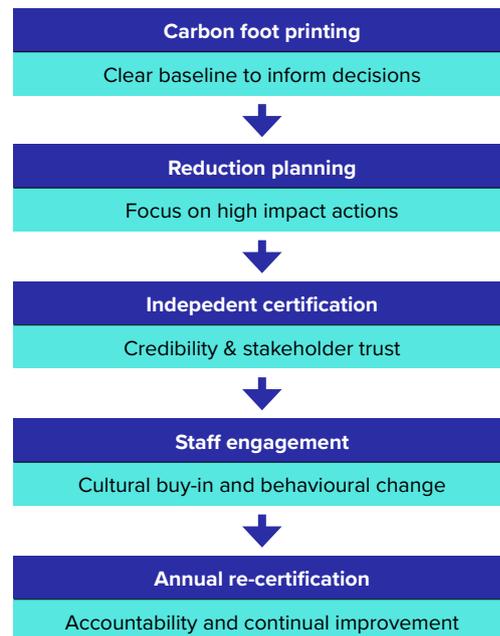


Figure 8: How to maximise carbon reduction through evidence-based assessment, staff engagement, and milestones.

Example tools to establish your benchmark:

The International Institute for Sustainable Laboratories (I2SL)	The International Institute for Sustainable Laboratories (I2SL) laboratory benchmarking tool allows operators to calculate the energy consumption, operational and embodied emissions, and operational practices of lab buildings versus similar facilities, and is positioned as a building-level assessment.
Labos 1.5	Labos 1.5 offers a tool to calculate the carbon footprint and build a greenhouse gas inventory of the laboratory. The EcoLabware simulator can be used to compare the carbon and water footprints of single-use and reusable equipment, however the emissions factors are specific to France and is not entirely accurate to the UK.
Planet Mark	To demonstrate the importance of benchmarking on reducing carbon footprints, Planet Mark, a sustainability certification and consultancy, have shown that of current members, 98% have made an immediate improvement to their carbon footprints, and on average members reduce their impact by 10% year on year. This demonstrates the value of assessing a baseline carbon emission for SMEs, to create a benchmark against which the organisation can track their carbon reduction.

Energy reduction

- Actions matrix
- Benchmarking
- Energy Reduction**
- LED lighting
- HVAC System
- Freezers
- Switch Off & Efficiency
- Consumables waste management**
- Waste Segregation
- Plastics: Reduce
- Plastics: Reuse
- Plastics: Recycle
- Solvent choice
- Non-consumables waste management**
- Water consumption
- Equipment reuse
- Corporate influence**
- Laboratory buildings
- Procurement
- Training & Ownership
- Biodiversity action
- Carbon offsetting
- Why SME's invest in sustainability?**
- Full circle labs
- Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
- ISO14001 Checklist
- ISO50001 Checklist
- Tenant sustainability checklist
- References
- [Download and print the laboratory signage](#)

Laboratory spaces use [3-5 times more energy per square metre](#) than non-laboratory spaces ^[2], and reducing energy consumption was the highest priority for life sciences businesses in MedCity's sustainability survey. Energy consumption can be addressed by reducing equipment use and updating or replacing hardware to increase efficiency which has a positive impact on cost and energy savings for laboratories.

KEY ACTIONS:

- Use **MedCity's laboratory best practice signage** to raise awareness to staff in the laboratory.
- Use **energy providers** which offer renewable energy contracts.
- **Update all lighting to low energy LED systems** and encourage staff to switch off when not in use.
- **Identify low-efficiency apparatus** or systems through direct energy consumption measurement and replace or upgrade motors to high-efficiency systems, measuring the change in consumption.
- **Educate staff on the impact of environmental temperature on heating, ventilation and air conditioning** (HVAC) energy consumption to encourage heat-generating equipment switch off, and keeping doors and windows shut where possible.
- **Upgrade HVAC and air removal systems** to be more energy efficient, or use responsive systems.
- **Choose laboratory buildings with a high energy rating** and communicate the value of sustainable buildings to investors.

LED lighting

Cost	Ease	Impact
££ + 		

Many older labs are not fitted with LED lighting, which provides a fast and easy route to reducing energy consumption and cost.

Imperial LED lighting replacements	
In 2024 Imperial began to upgrade its lighting to low energy, light emitting diodes (LEDs) to save power and minimise carbon footprints.	The upgrades across 18 buildings will reduce energy consumption by 137,680 kWh per year, saving 28.5 tonnes of carbon annually, the equivalent of up to five households. Read more
London BioScience Innovation Centre (LBIC) LED lighting replacements	
LBIC has carried out LED light replacements, as well as implementing a 'Big Switch Off' over the Christmas period. LBIC measured baseline energy consumption across its building and clearly communicated the energy and environmental benefits of switch off initiatives and energy saving transitions to tenants. Communicating such tangible savings is key to reinforcing the importance and impact of behavioural changes and maintaining sustainable practices.	Baseline measurements were taken from the weeks prior to Christmas, as well as from Christmas week the previous year. By encouraging participation in a "Big Switch Off" during quiet periods such as Christmas, LBIC measured a 17% energy saving across the entire building compared to the previous year, and a 21% saving compared to average weeks, resulting in a £641 reduction in costs. Replacing lights with LEDs has also led to a 10.5% reduction in half hourly energy consumption.

Energy reduction

Heating ventilation and air conditioning systems (HVAC)

- Actions matrix
- Benchmarking
- Energy Reduction
 - LED lighting
 - HVAC System**
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Cost	Ease	Impact
£££ + 		

HVAC systems are one of the largest contributors to scope 1 emissions in labs, estimated to account for as much as 64% of lab energy consumption^[12]. Laboratory operators can upgrade air removal systems with more efficient motors to significantly reduce energy consumption.

For SMEs who cannot afford to get a responsive system, consider air monitoring as an evidence based method to set air exchange rates in the laboratory.

London BioScience Innovation Centre air management systems

[London BioScience Innovation Centre \(LBIC\)](#) approaches sustainability by measuring baseline consumption, identifying ways to reduce carbon intensity and calculating the potential saving and impact before making changes.

In this case, LBIC focused on updating its extractor fans for active lab extraction by measuring the baseline and determining the cost and energy savings of replacing old motors.

By measuring the baseline consumption and cost, then comparing the energy saving and cost of a new motor replacement, labs can identify the high-consumption appliances in their buildings and focus on the highest-impact changes they can make to reduce their scope 1 and 2 emissions.

The team bought a data logger and captured the power consumption of one fan motor, which was 1.84kWh. By replacing this motor with a new one which operated at 1.64kWh, a 10.8% saving could be made.

This saving translates to 1745kW and 388 tonnes of CO₂, as well as £455 in energy.

The data logger cost £150, a new motor cost £200 and half a day's labour to fit. It would save more than £9,110 and 7,758 tonnes of CO₂ every year if all 20 motors in the building were upgraded.

Pharmaceutical site in France: Case study by Abaubakry M'Baye

At an industrial pharmaceutical site in France, a HVAC system represented 57% of the site's carbon emissions.

The changes did not degrade global performance and reduced energy consumption by 24% in less than three years.

Key steps were taken to minimise the energy consumption of the unit, **under these principles:**

- Reduce quantity of air.
- Reduce air treatment periods.
- Maximise efficiency of air treatment by design and by management.

Upgrades to the HVAC unit included:

- Variable speed motors to match demand and avoid overprocessing.
- Upgrades to electronically commutated motors to increase efficiency.
- Smart controls with sensors and automation to ensure the system runs at the rate necessary based on real time conditions.
- Energy recovery ventilators capture and reuse energy from exhaust air to precondition incoming air, reducing heating and cooling loads.
- Dividing spaces into zones with independent climate control to avoid conditioning unoccupied areas.

[Read the full publication](#) →

Energy reduction

Freezers



- Actions matrix
- Benchmarking
- Energy Reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Freezers
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Cost	Ease	Impact

Increasing the efficiency of freezer storage, by defrosting and cleaning the freezers regularly, and increasing the temperature of fridges and freezers reduces energy consumption.

KEY ACTIONS (GREEN LABS RECOMMEND):

- **Biannual defrosting and clean up of freezers**, ensuring seals are not blocked by frost.
 - Overfull shelves decrease airflow and increase energy consumption.
- **Clean filters every 3 months**, or energy consumption can increase by 14-25%.
- **Keep an inventory map** to track samples and enable fast use of freezers. Increase regular freezer temperature from -25°C to -15°C.

Join the [Free Freezer Challenge](#)

Imperial freezer challenge participation	
<p>Julia Grizenkova's lab at Imperial Department of Life Sciences participated in the My Green Lab freezer challenge, and reported significant cost savings:</p> <ul style="list-style-type: none"> • Ultra Low Temperature (ULT) freezers were switched from -80°C to -70°C. • This change reduced energy consumption by 30%. • The resulting energy saving translated to 2.36 tonnes of CO₂ annually, and a cost saving of £2,669.87 per year for the lab. <p>My Green Lab freezer challenge results from Imperial College London:</p> <ul style="list-style-type: none"> • 2025: total of 1445 kWh/day saved (per annum 527,425kWh or £126,529 or 109.20tCO₂). • 2024: total of 777.65kWh/day saved (per annum: 283,842 kWh pa or £76,637 or 58tCO₂). 	<p>Imperial's Allison Hunter published on freezer costs in 2014, and submitted figures to the European Commission to lobby for Ecodesign regulations to be applied to scientific laboratory refrigeration, which may be ratified by the end of 2025.</p> <p>Freezer energy reduction strategies have saved 51552kWh/pa (£21,000 at 2023 prices) and reduced the average freezer energy from 5,500kWh to 4,400kWh per unit per annum over time (Danny Peckham). This was achieved through:</p> <ul style="list-style-type: none"> • Rolling replacement purchase of energy efficient freezers. • Gatekeeping purchases. • Support for defrosting and decanting.
King's College London: participation in LEAF and the ultra low temp freezer challenge	
<p>A campaign from the Sustainable Research Team at King's College London consolidated and improved the efficiency of ULT freezers in labs.</p> <p>They counted the number, size, and energy consumption of freezers and assessed their use and opportunities to clean out samples, consolidate space and increase efficiency by replacing old ULT freezers with new energy-efficient options.</p> <ul style="list-style-type: none"> • 92 inefficient freezers were replaced with 46 ultra-efficient units. • ULT consolidation in a 2 old for 1 new scheme recovered 166m² lab space. • The campaign equates to yearly savings of £360,000 and 410,000 kWh. 	<p>Actions taken:</p> <ul style="list-style-type: none"> • Assess the utilization of lab freezers in use across the estate (make, model, location, kWh requirement). • Discard contents no longer needed and condense remaining items. • Place frequently used items at top of fridge, seldom used ones at bottom. • Reduce the ULT freezers' temps from -80°C, to -70°C or -60°C where permitted. • Replace energy inefficient freezers with newer, more energy efficient ones.

Energy reduction

Equipment switch off and efficiency



- Actions matrix
- Benchmarking
- Energy Reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References

[Download and print the laboratory signage](#)

Cost	Ease	Impact

Equipment switch off directly reduces unnecessary energy consumption and HVAC unit energy consumption. Many large apparatus and heating instruments in labs contribute significantly to the temperature of the labs, meaning HVAC units have to work harder to manage the overall temperature.

By encouraging staff to keep doors and windows closed, and turn off apparatus when not in use, the heating and cooling action of HVAC units is minimised and, as the greatest demand on energy consumption, a significant impact on overall energy consumption is seen.

KEY ACTIONS:

- **Turn off water baths, cooled centrifuges, pH meters, balances and heating plates** when not in use or at the end of the day if not in use overnight.
 - Adding a lid or plastic balls in water baths and rotary evaporator baths can reduce energy loss.
 - Consider switching to metal bead baths.
 - A heat block consumes 1.5 times as much energy as -20°C freezers, and water baths at 37°C consume twice as much energy.
- Set **PCR machines to 12°C** or higher instead of 4°C once the cycle has finished.
- Implement **stoplight system** for switch off [\[print the laboratory signage\]](#).
- Fume hoods use 3-3.5 times more energy than ultra-low temperature freezers. **Ensure lab members lower sash** to reduce energy consumption by 67%.
- Consider **turning off fume hoods overnight**, using stoppers or covers to reduce evaporation from bottles where safe.
- Ensure new and replacement equipment are efficient and **check their energy labels** for sustainability properties.
 - Request a life cycle assessment and check the ACT database provided by My Green Lab at: <https://actdatabase.mygreenlab.org>
- **Write time taken to reach temperature** for centrifuges, heat blocks and water baths on the unit so that lab members can turn them on in a timely manner without wasting energy.
 - [\[Download and print MedCity equipment labels\]](#).
 - Add heat up timings to protocols, and at which step it is appropriate to turn off equipment.
- **Replacing old motors** with new energy-efficient ones.
- Opting for **renewable energy suppliers** to power operations.
- **Adopt sustainable practices** when using high-power computing for research.
 - Follow these '[Ten simple rules to make your computing more environmentally sustainable](#)' from Lannelongue et al 2021.

Imperial: Automating switch-off	
Henry Wood's lab at Imperial has implemented automated switch off with socket timers. The team has implemented automated timers for apparatus to ensure equipment is switched off when not in use.	Download MedCity's printable equipment switch off labels.
Green DiSC: Reducing the carbon impact of digital activities	
Green DiSC is a certification scheme designed to guide research organisations in reducing the environmental footprint of their digital activities. It offers a roadmap for implementing sustainable practices in areas such as software development, data management and computational research. The certification aims to foster a culture of sustainability within the research community.	For more detailed information on Green DiSC and the available training services, you can visit the Green DiSC page.

Consumables waste management

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
 - Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
- References
- [Download and print the laboratory signage](#)



Waste segregation

Many labs don't segregate their waste, or even have separate bins in the lab for recycling. This means significant portions of recyclable materials are put into high-temperature incineration unnecessarily, contributing 1,074Kg CO2 equivalent/tonne of waste ^[13].

Cost	Ease	Impact
£	👍👍👍👍👍	🌱🌱

KEY ACTIONS:

- Implement **appropriate waste streams** including recycling bins across all lab spaces.
 - These could include general, hazardous/clinical and recycling bins in all labs with clear colour schemes and labels.
- **Labels with pictures** and examples tailored to your lab will be most effective.
 - [Download MedCity printable recycling bin labels.](#)
- Other **lower carbon waste streams**, such as offensive and infectious, could be considered where possible.

King's College London: Re-Classification of clinical waste

<p>Annual clinical waste audits indicated that King's was overclassifying waste, sending offensive and clean, dry recyclables for high-temperature incineration unnecessarily. This was a recurring finding in clinical waste audits, so was prioritised.</p> <p>King's produce approximately 165.5 tonnes of clinical waste per year, 10-20% of which was non-contaminated recyclables. From their audit findings, King's estimated the cost and carbon savings to be made across King's.</p>	<p>King's rolled our recycling bins across labs to capture clean, dry, uncontaminated recyclables to direct them to recycling.</p> <p>Offensive waste was separated from clinical waste, and the waste contractors decant clinical wastes on collection in a single vehicle, making the process more transport-efficient and cost-effective.</p> <p>Predicted savings since making these changes are in the region of £10,000's</p>
--	---

Methodology:

1. Examine the contents of your laboratory bins clinical waste bins (conduct a series of waste audits).
2. Communicate findings to lab users – highlighting best practice.
3. Offer training to lab users on how to manage waste properly, focusing on correct disposal generating cost and carbon savings as well as greater compliance.
4. Re-examine laboratory bin contents after a trial period to establish improvement/dis-improvement.
5. Focus on continual improvement (plan, do, check, act).



Consumables waste management

Plastics

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management**
 - Waste Segregation
 - Plastics: Reduce**
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

Plastic management can be addressed by reducing, reusing and recycling. Minimising initial use is the most important step, then cleaning and reusing and recycling where necessary would be the ideal workflow to limit single-use plastics in labs.

Plastics: Reduce

Single-use plastics are significant contributors to plastic waste in laboratories ^[14]. Reduction in the use of single-use plastics is the best place to start. There are multiple ways to reduce single-use plastic by reducing the number and the size used.

Cost	Ease	Impact

KEY ACTIONS:

- Conduct an **annual review** of consumption to identify reduction opportunities and track progress.
- **Switch from plastic to glass** petri dishes, glass or metal spreaders or beads for bacteria culture.
- **Reduce the number:**
 - Store counterweights for centrifuges rather than new preparations each time.
 - Use glass stripettes and graduated cylinders instead of plastic syringes where possible.
 - Use ceramic weighing boats or weighing paper instead of plastic weighing boats.
 - Use Duran bottles, beakers or Erlenmeyer's instead of Falcon tubes for solutions which don't need centrifugation.
 - Rethink experiments to perform fewer steps or reuse plastics across steps.
- **Reduce the size:**
 - Use appropriately sized containers and consumables to the final volume to be stored or measured.
- **Choose bio-based or recycled plastics** where possible, or polypropylene as an autoclavable plastic with a lower carbon impact during production, and request life cycle assessments from providers:
 - Check for sustainability accreditation and certification, preferably with third-party verification such as [ACT](#) and [SLS](#) for products and Ecovadis, SBT, CDP for companies measured.
 - A lack of certificate doesn't necessarily mean a less sustainable product and vice versa.
- **Use 3D printers to print replacements** for small plastic components to lower cost, reduce shipping and enable use of recycled or biodegradable materials.





Consumables waste management

Plastics: Reduce

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management**
- Waste Segregation
- Plastics: Reduce
- Plastics: Reuse
- Plastics: Recycle
- Solvent choice
- Non-consumables waste management**
- Water consumption
- Equipment reuse
- Corporate influence**
- Laboratory buildings
- Procurement
- Training & Ownership
- Biodiversity action
- Carbon offsetting
- Why SME's invest in sustainability?**
- Full circle labs
- Purcell global ltd
- Frameworks to follow**
- Summary
- Resources
- ISO14001 Checklist
- ISO50001 Checklist
- Tenant sustainability checklist
- References
- [Download and print the laboratory signage](#)

Alternative bio-based plastics

Full Circle Labs: using Bio-based consumables	
<p>Full Circle Labs has adopted Eppendorf's BioBased pipette tips, saving over 2Kg per year of non-recycled PCR plates.</p> <p>Eppendorf's range of bio-based consumables made from renewable feedstock address the use of single-use plastics from virgin plastic sources in life science labs. Eppendorf has collaborated with Neste to develop plastics from renewable feedstocks.</p> <p>The BioBased line incorporates 90% renewable feedstock from waste cooking oil and 10% fossil origin.</p>	<p>Businesses can use Eppendorf's carbon emission saving calculator, which estimates a lab user's potential saving in CO2 each year by making the change to bio-based pipette tips and vials.</p> <p>If a user consumed 200 tips and 20 vials per day, this could lead to an annual saving of up to 90kg of CO2 per user, equal to the emissions from a drive between London and Manchester.</p>
Green Elephant Biotech bio-based consumables	
<p>Green Elephant Biotech has taken a sustainable product design approach to minimising its emissions and environmental impact.</p> <p>Green Elephant Biotech has developed fully scalable, price-competitive, GMP-compliant bioreactors and 96 well plates which are comparable to petrochemical-derived PET/Polystyrene (PS) standards, but which are manufactured from polylactic acid (PLA) derived from sugarcane and corn starch.</p> <p>Further, these plastics are manufactured with 3D printing to enable complex structures not achievable by injection moulding. This method also reduces material use by 80% versus other systems, meaning materials are not only more sustainably sourced, but less is used in the overall process.</p> <p>Green Elephant Biotech has also conducted a full life cycle assessment on its CellScrew product, and demonstrated lifetime carbon emissions which equal just 14.4% of competitor systems. Choosing providers which provide full transparency over product life cycle assessments is imperative to developing accurate scope 2 and 3 emissions.</p>	<p>Green Elephant Biotech's products reduce carbon emissions through:</p> <ul style="list-style-type: none"> • Removal of carbon through crops grown for PLA synthesis. • No dependence on virgin plastic from fossil fuel. • Energy and water savings of 22-55% and up to 85% respectively, versus other plastics. • Biodegradable plastics if uncontaminated. • Reduction of raw material use by up to 80% through 3D printing techniques. <p>By rethinking manufacturing methods and designing systems with sustainability in mind, Green Elephant Biotech has developed a significantly more sustainable alternative to petroleum-derived single-use plastics in the lab.</p>





Consumables waste management

Plastics: Reuse

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse**
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
- References
- [Download and print the laboratory signage](#)

Cost	Ease	Impact

KEY ACTIONS:

- **Reuse old solvent bottles** as waste canisters rather than ordering new canisters for disposal
 - Remove existing labels and label clearly as waste disposal.
- **Use old pipette tip boxes** to store small or loose items and use as containers for autoclaving.
- **Sign up to take-back schemes** from tip boxes to polystyrene, and always request them if unavailable (these may reuse or recycle packaging depending on the scheme).
- **Reuse plastics by decontaminating and washing**, and use polypropylene plastic to autoclave and sterilise it, such as PP falcon tubes, petri dishes, fly vials and well plates.
- Use **refill racks** for pipette tips.

Full Circle Labs	
<p>Full Circle Labs have designed their services to maximise reuse of plastic packaging. Reusable sample bags are sent to users to return their samples to Full Circle Labs. The QR codes on the bags are then updated with a new link for the next sample, and the same bag is used for subsequent orders.</p> <p>Currently Full Circle Labs are piloting their reusable sample bags at Imperial College London. In their pilot scheme, reusable sample bags have been recirculated 117 times since Dec 9th 2024 (around 23/month), saving 5.5kg of plastic/year compared to other service providers who typically use 50 mL tubes for sample packaging.</p>	<p>When designing packaging, suppliers should:</p> <ul style="list-style-type: none"> • Consider points in the supply chain where packaging can be minimised and returned to suppliers. • Consider if packaging can be reused for subsequent orders. • Minimise printing and labelling requirements with editable QR codes. • Communicate to clients the packaging saved by opting in to reuse schemes.

The University of Liverpool has developed a **user guide** to identify sustainable suppliers, and supplier take-back schemes, available [here](#).

Some key schemes featured in this list, and from recommendations in MedCity's sustainability survey include:		
Pipette Tip Box Reuse: see the full list on the University of Liverpool's website .		
<p>Sarstedt: recycle and refill tip boxes - Free</p>	<ul style="list-style-type: none"> • Collect Sarstedt boxes in a large box. • Email recycling.gb@sarstedt.com to arrange collection 	<p>Read more</p>
<p>Starlab: TipOne plastic recycling - Free</p>	<ul style="list-style-type: none"> • Register by emailing recycling@starlab.co.uk. • Companies can collect pipette tip boxes in a large box. • Once full, organise collection through the Starlab collection portal. 	<p>Read more</p>
Reagent bottle reuse		
<p>Fisher scientific: reagent bottle recycling - Free</p>	<ul style="list-style-type: none"> • Fisher scientific can accept returns of Winchesters, Mausers, cardboard packaging of their products and wooden pallets. 	<p>Read more</p>
Reagent bottle reuse		
<p>New England Biolabs: polystyrene box recycling - Free</p>	<ul style="list-style-type: none"> • New England Biolabs receives back approximately 20% of polystyrene shipping boxes, of which 96% are reused and 4% are recycled. • In addition, cold shipment ice packs are reusable and degrade in sunlight so can be used as garden irrigation. 	<p>Read more</p>
<p>Promega: polystyrene box returns - Free</p>	<ul style="list-style-type: none"> • Returns labels are included on Promega boxes to ship back for reuse, free of charge. 	



Consumables waste management

Plastics: Recycle

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

For activities which require single-use plastic, there are excellent recycling schemes in development to move towards a circular economy in life sciences research. Laboratory plastics, protective packaging, and clinical single-use garments which enter the system are recycled and regenerated back into the system.

Cost	Ease	Impact
£	👍👍👍👍	👎👎

KEY TACTICS INCLUDE:

- **Recycle single-use plastics** through circular economy services.
- **Work with sustainable plastics providers:**
 - If researchers are concerned about the impact of recycled plastics on experiments, you can request assessments from plastics manufacturers via analytical providers such as Extractus to carry out leachable assessments and validate plastics from circular economy against virgin single-use plastics.
- **Choose providers with take-back schemes for polystyrene and packaging** where possible, and request take-back schemes if not already provided.

Contaminated Plastics

LabCycle contaminated waste recycling

LabCycle is the first company in the world to decontaminate and recycle hazardous lab plastic waste from the research and healthcare sectors. Partnering with the NHS, universities and private companies, LabCycle collects, decontaminates and recycles lab plastics into 100% recycled lab consumables. This sustainable model helps organisations transition to a circular economy, reduce CO₂ and scope 3 emissions, and make tangible progress toward net zero goals.

<p>How it works for lab users</p> <ol style="list-style-type: none"> 1. Use LabCycle bins: contaminated lab plastics are placed into bins provided by LabCycle and sorted by polymer type at the point of disposal. 2. LabCycle collects: waste is collected on a scheduled basis. 3. Plastic decontamination and recycling: the collected plastics are decontaminated and recycled into 100% recycled lab consumables, for example, turning used petri dishes back into new petri dishes. This demonstrates a practical circular economy in action, eliminating the need for incineration or autoclaving. 	<p>Lab benefits:</p> <ul style="list-style-type: none"> • 90% reduction in CO₂ emissions compared to incineration, achieved by recycling with LabCycle • Eliminates the need for autoclaving, leading to a significant reduction in energy consumption and water use, supporting labs on their journey to net zero. • Reduces reliance on virgin polymers, cutting both environmental impact and material costs using LabCycle's recycled consumables.
--	---

The biomedical sector generates **5.5m tonnes of plastic waste annually**, with more than **90% classified as hazardous**, most of which is incinerated. This results in CO₂ emissions equivalent to 23m petrol cars on the road each year.

LabCycle is pioneering a circular economy model for lab plastic waste. Its closed-loop system ensures complete decontamination and sterility, while preserving polymer quality, enabling recycled materials to be used in the manufacture of new lab-grade consumables. The company is currently scaling in partnership with the NHS, while also supporting universities and private research organisations across the UK in transitioning to sustainable waste management practices. LabCycle's 100% recycled products are available to order now, with a significantly expanded catalogue set to launch over the next 12 months.



Consumables waste management

Plastics: Recycle

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Uncontaminated Plastics

RecycleLab: Uncontaminated plastics recycling

RecycleLab is a UK-based company specialising in the collection, and recycling of uncontaminated single-use plastic laboratory consumables.

- RecycleLab collaborates with laboratories to assess current waste management practices, aiming to identify areas for improvement and implement sustainable strategies.
- It provides bespoke collection services for plastic laboratory consumables, ensuring proper sorting and recycling tailored specifically for scientific labs.
- RecycleLab uses these plastics to manufacture lab-grade plastic pellets, and supplies these to manufacturers, promoting a circular economy within the science industry.

London Bioscience Innovation Centre (LBIC): Outcomes from RecycleLabs

At LBIC, lab plastics were going to high temperature incineration, even if they were uncontaminated. RecycleLab allows for uncontaminated waste to be recycled and re-enter the lab as consumables. RecycleLabs delivered bins to LBIC and hosted a lunchtime waste segregation workshop to introduce the new waste segregation stream. RecycleLab collects the plastic waste once full. In 2024, LBIC recycled more than 466kg of plastics, and has already recycled more than 357kg of plastic in the first half of 2025. This process saved 74% of carbon emissions versus high temperature incineration, which is equivalent to 1.7 tonnes of CO₂ in 2024, and 1.3 tonnes of CO₂ in H1 of 2025.

Full Circle Labs: Outcomes from RecycleLabs

Full Circle Labs report a saving of approximately 720 kg of waste from landfill per year (or 1kg of plastic per user per year) through RecycleLabs recycling scheme, and are able to recycle 98% of their single-use plastics through the scheme

Clinical single-use wearables

Appleton: surgical glove recycling

Appleton offers a recycling service for the disposal of non-hazardous dry plastic laboratory waste including gloves and masks. Its 100-litre waste recycling box can be installed in labs for the disposal and recycling of gloves which have been used with non-hazardous applications.

Revolution Zero: surgical gown recycling

Revolution Zero is working to displace single-use medical textiles, notably sterile surgical drapes, gowns and operating theatre garments through its decontamination process using low temperature washing which meets regulatory requirements. Revolution zero estimates an impact of 17,000 tonnes of CO₂ emissions per year across the NHS.

Packaging

Full Circle Labs: Recycling delivery packaging

With numerous deliveries, boxes, and the packaging inside them, not all providers offer take-back schemes, and not all labs have the space to store individual packaging for those take-back schemes. The team at Full Circle Labs addressed this challenge more directly. First, taking packaging to local recycling points and supermarkets, then through First Mile Recycling, a closed-loop recycling service. First Mile will pick up business waste on a regular schedule ranging from cardboard and paper to a range of plastics which can be segregated as non-contaminated waste in a lab, and directly manufacture waste materials into new products. Through this scheme, Full Circle Labs recycles around 3kg of soft plastic waste per month from lab and business-related packaging.

University of Nottingham: recycling expanded polystyrene

The University of Nottingham has implemented a successful programme to recycle expanded polystyrene (EPS), commonly used in laboratory packaging. EPS is often excluded from standard recycling streams due to its lightweight and bulky nature.

Laboratories generate significant amounts of EPS waste, so the University of Nottingham initiated a pilot recycling programme

1. A drop-off point was established at the Biodiscovery Institute (BDI).
2. Collected polystyrene was transported to Nottingham Recycling Ltd, where it underwent compaction to reduce volume.
3. The compacted material was sent for recycling, diverting it from landfill and contributing to a circular economy.

For large, shared buildings, installing an on-site polystyrene compactor could be beneficial. This equipment reduces the volume of EPS waste, making storage and transportation more efficient. Institutions may consider partnerships with local recycling facilities to support such infrastructure.



Consumables waste management

Solvent use and choice

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumable waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

The most important principles of waste management to reduce environmental impact are reduction of the amount of waste generated, prevention of the release of waste and elimination of hazardous substances.

Cost	Ease	Impact
£	👍👍	🌱🌱🌱

KEY ACTIONS:

- **Know the hazard rating of the solvents you are using** and where possible identify alternatives.
- **Reduce solvent use** where possible in cleaning and increase use of lab dishwashers.
- **Return solvent containers** to providers.
- **Adapt equipment** to more environmentally friendly gas and produce gas on-site with generators where possible.

In many cases laboratory equipment is cleaned with solvents which could otherwise be cleaned in laboratory dishwashers with [dishwasher accessories](#) for pipettes and glassware. By investing in dishwashers with suitable racks, and guidelines to only use once full and on an eco-cycle, labs can reduce the amount of solvent used.

The American Society for Chemistry’s [green chemistry tools](#) support environmentally conscious choice of solvent. [MIT EHS also has a green chemistry guide](#) with alternatives for undesirable solvents, reagents and products.

The University of York’s [Green Chemistry Centre of Excellence](#) is a world-leading academic facility for pioneering pure and applied green and sustainable chemical research. They directly address sustainable development goals within the UN’s 17 goals, and have a unique industrial engagement facility to enable strategic partnerships with businesses to support the development of green chemistry in research.

Laboratories can work with solvent providers such as Merck and Supelco to use returnable solvent containers such as stainless-steel drums and barrels.



Non-Consumables Waste Management

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumable waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

Water Consumption

Laboratories are water-intensive environments, with high demand through condensers, aspirators, cleaning, and autoclave use. One cubic meter of water used generates 10.4kg of CO₂ equivalent^[15], so reducing water use saves money and carbon emissions. Further, reliance on suppliers for deionised water means water is transported regularly to sites by providers and is highly energy intensive to produce.

Cost	Ease	Impact
£ + 		

KEY ACTIONS:

- **Reduce water flow** through aerators, Findensers, autoclave water meters and vacuum pumps.
- **Induce behavioural change** by ensuring ultrapure water and nuclease-free water is only used where needed.
- Ensure **autoclaves are only run at full capacity on a specific schedule** and turned off at night.
- **Replacing water aspirators with regular vacuum pumps**, which reach a higher vacuum, can save the equivalent to the annual water use of 750 people over a year, according to a Green Labs estimate.
- It can take **up to five litres of tap water to produce 1 litre of ultrapure water**, and if not produced onsite, there are significant transport emissions from delivery.
 - Only use ultrapure water when absolutely necessary for an experiment in order to reduce consumption.
 - Use [MedCity's laboratory signage](#) to emphasise this point in the lab.
 - Invest in deionised or ultrapure water generators to produce on-site and reduce transport emissions as well as significant cost savings.





Non-consumables waste management

Water consumption

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumable waste management**
 - Water consumption**
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Reducing water waste

UC San Diego (UCSD): low flow aerators and single pass colling retrofits to save water. [Read the full report](#) from UCSD.

UCSD has installed low flow aerators which reduce the volume of water from laboratory taps while maintaining water pressure. These aerators save up to 34 litres of water per minute; UCSD saved more than 4m litres of water in 2017-2018.

Read this [simple guide](#) to measuring flow and installing aerators.

A change from flowing water for cooling apparatus to [Findensers](#) has saved UCSD more than 100m litres of water each year (with 300 Findensers), which are used as super air condensers and can replace the need for water-cooled condensers in over 95% of all reflux reactions.

UCSD reduced autoclave water usage by installing Water-Mizer autoclave retrofits, which monitor the drain temperature and apply cold water to adjust the discharge when needed. Autoclaves can use up to 228 litres of water per cycle – one Water-Mizer can save 75-90% of normal water flow rate through cold-water flow autoclaves. 100 autoclaves at UCSD saved more than 4,000 litres of water each day on average.

Imperial Life Sciences Autoclave Optimisation

Allison Hunter, Fiona May, and James Mansfield at Imperial have installed plate heat exchangers to the building process chilled water, and installed in-machine water saving devices to reduce water consumption from an estimated 32,000 liters per week to actual 12,000 liters per week. This project involved estates, safety, and faculty estates teams.

Further details on autoclave provision changes at Imperial can be found [here](#).

Managing deionised water consumption

[Extractus: Onsite deionised water generation](#)

Extractus has invested in on-site generators for deionised water and gas to minimise external purchasing and transport and reduce long-term costs of procurement.

- Extractus have purchased a water purification machine to remove the need to buy in purified water and remove associated transport costs and emissions.
- Sharing of deionised water produced with neighbouring laboratories, and sharing the cost of maintenance.
- Previously, deliveries of 2x2L plastic containers of water per month cost up to £125 per month, and incurred consistent transport emissions, and plastic containers were not recycled by the supplier.
- The water purification system costs tenants £360 per year to share the water system, creating a total cost saving of £1,140 per year.

Through investment in deionisation machines and on-site generated gasses, Extractus has made significant carbon savings as well as long-term financial gains.



At LBIC, we feel its vital to show leadership in the area of sustainability. Bioscience R&D is energy intensive and consumes natural resources, so we take the view that our activities should not only support the bioinnovation agenda but also the future of our planet more broadly. As an important innovation hub, we are taking the lead in reducing our environmental impact to ensure a healthier planet for healthier people. Our strategy for sustainability ensures that the breakthroughs of today do not come at the expense of tomorrow.

Rich Ferrie, CEO, London Biosciences Innovation Centre (LBIC)



Non-consumables waste management

Equipment reuse

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumable waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Laboratory equipment is expensive and carbon-intensive to buy new. Often there are long transport distances incurred, and significant scope 3 emissions associated with buying new equipment. By developing a circular economy of equipment, the scope 3 emissions for equipment which is still functional can be significantly improved.

Cost	Ease	Impact
Profit or		

KEY ACTIONS:

- **Sign up to equipment recycling schemes** in the UK to buy and sell laboratory equipment and office equipment.
- **Second hand equipment's energy consumption can be tested**, and in some cases motors can be upgraded to be more energy efficient.
- If you must buy new equipment, **request a full lifecycle assessment (LCA) from your provider**.

Warp It: Equipment recycling

Warp It is a web-based reuse platform designed to help organisations redistribute unwanted office and lab equipment internally or to approved external partners. It enables public sector bodies, universities, NHS trusts and companies to cut waste, reduce procurement costs and support sustainability goals by finding new homes for surplus items.

More than 1,000 organisations including many UK universities and NHS trusts are registered users of Warp It, which supports both internal transfers and donations to charities or schools, and has a paid subscription for businesses.

How it works for lab users:

1. Staff upload photos and details of surplus items (eg lab furniture, IT kit, equipment).
2. Items are first offered to other departments within the same institution for free.
3. If unclaimed, items can be offered to pre-approved external organisations including charities, schools, startups or local authorities.
4. Warp It provides real-time analytics on financial savings, waste avoided, CO2 reductions and item popularity.

University of Glasgow case study:

- Saved £1.2m in procurement and disposal costs
- Avoided more than 350 tonnes of waste.
- Prevented nearly 700 tonnes CO2 emissions.
- Increased lab and office reuse rates by standardising Warp It across estates, IT and departments.

Key reused items:

- Lab chairs, benches, fridges/freezers.
- Shelving, trolleys, storage units.
- Desks, cabinets, IT monitors.
- Scientific consumables (glassware, containers).

UniGreenScheme: Equipment recycling

UniGreenScheme is a circular economy initiative that helps universities, research institutes and commercial laboratories reuse, recycle or donate unwanted lab equipment. Equipment can range from centrifuges and glassware to fume hood components and ULT freezers. It bridges the gap between surplus lab assets and organisations which can put them back into use, reducing waste, saving carbon and enabling access to affordable scientific equipment.

Get started:

1. Read the [user guide](#).
2. Register equipment for collection on www.unigreenscheme.co.uk
3. Designate a Green Champion to identify redundant assets regularly.
4. Integrate reuse into procurement and decommissioning Standard Operating Procedures (SOP).
5. Use UniGreenScheme reports to evidence sustainability KPIs in audits or funding bids.

1. Labs or estates teams register surplus equipment via an online form. UniGreenScheme collects, audits and logs equipment into a centralised reuse system.
2. Equipment is cleaned, tested and resold through UniGreenScheme's platform to other labs, schools, startups or NGOs at discounted rates.
3. The original institution receives a portion of the resale value, typically around 30–50%, incentivising reuse and reducing storage waste.
4. Full sustainability impact reports are provided to partners, including carbon savings, waste diverted from landfill.

Corporate Influence

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)



Laboratory buildings

For SMEs, the building they operate their lab in is one of the largest influencers on their scope 2 emissions. Choosing buildings which have high energy efficiency, are easily accessible by public transport and provide centralised operations for delivery, ordering, shared autoclaves and other lab provision can significantly impact carbon footprints of businesses.

Cost	Ease	Impact
£££££	👍👍👍	🌱🌱🌱🌱

KEY ACTIONS:

- Invest in a building which provides **greater carbon neutrality potential to move towards net zero.**
- **Use the MedCity lab providers question list** to see how many sustainability initiatives are implemented in the building.

Sustainable Building Design [Oberlanders Architects design of the University of Dundee Life Sciences Innovation hub](#)

The principal aim of the energy strategy for the building was to minimise base energy consumption as far as is practicable through a fabric first approach with efficient M&E services to meet the aims of the University of Dundee to reduce carbon emissions. The scale of the challenge was increased by the Chemistry focused use profile for the building, with 50 fume cupboards incorporated in the initial design requirements and the significant air handling requirements.

Heat capture and recovery systems were deployed along with very low energy lab design to provide an efficient, clean, and zero carbon way of heating and cooling the building.

The completed building achieves EPC rating A, regulated energy of 50kWh per square meter per year, and 6.89kg of Co2 equivalent per meter squared per year.

The design included full fresh air up to 2 liters per second per square meter, and energy was supplied via an innovative all-electric geothermal heat pump heating and free cooling-based approach through a Black Mountain-Erda Geo Exchange System with directional boring technology.

Extensive heat recovery systems were incorporated via AHU plant and by using ground bored to recharge the ground with heat recovered from vent systems in the summertime to be stored to use in the winter.

The building energy performance will be monitored against the designed solution as tenants occupy the space.





Corporate influence

Laboratory buildings

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References

[Download and print the laboratory signage](#)

There are two main types of frameworks for assessing building efficiency: [Ska](#) and [BREEAM](#) (Building Research Establishment Environmental Assessment Method).

[Ska ratings](#) are widely recognised sustainability assessments designed for fit-outs of commercial properties in the UK.

UCL has developed a Mini-Ska, which is used as a minimum standard for all small projects in refurbishments on its estates. The Mini-Ska ensures the continuous improvement of sustainability in UCL buildings. The framework is publicly available and could be adopted by spin outs and SMEs fitting out their lab spaces.

[Download the UCL Mini-Ska template.](#)

When starting a development or refurbishment project, co-ordinators are required to fill out the Mini-Ska form which covers:

- Longevity assessment of project.
- User guidance for sustainability.
- Circular economy principles.
- Airflow requirements based on occupancy.
- Heat recovery and equipment cooling.
- Energy reduction and metering.
- Recycling and water use.
- Staff wellbeing and inclusion.
- Landscaping and biodiversity.

By using UCL's Mini-Ska framework, lab operators can maximise sustainable design through UCL's intuitive spreadsheet tracker.

[BREEAM certification](#) is the longest-standing method of assessing, rating and certifying the sustainability of buildings. It sets the benchmark for the environmental performance of buildings across their life cycle from design and construction to operation and refurbishment. Therefore, SMEs can influence their scope 2 and 3 emissions significantly by choosing to invest in BREEAM-certified laboratory spaces.

Examples of BREEAM-certified excellent laboratories and key actions they have taken to increase building sustainability:

- **The Francis Crick Institute:** featuring a combined heat and power plant with [more than 800 custom-built solar panels](#), low flow water fittings and presence detectors to minimise potable water use.
- **Sir Michael Uren Hub, Imperial:** incorporated [granulated blast furnace slag](#) in its construction as a cement substitute in concrete to reduce carbon emissions.
- **GSK's carbon neutral laboratories for sustainable chemistry:** achieved BREEAM outstanding as a carbon neutral building. A [230.9kWp](#) solar array covers 45% of the building, and a 125kWe biofuel combined heat and power system on-site provides most of the heat needed for buildings. Additionally, the frame, walls, and floors of the building are built with FSC-certified timber sourced from Europe.

Buildings are assessed against 10 categories each with weighted credits. Only the **top 10% achieve excellent**, and **1% achieve outstanding**.

1. **Energy:** increase efficiency and renewable energy use.
2. **Health and wellbeing:** optimise natural light, materials and air quality.
3. **Water:** efficient use and sourcing.
4. **Waste:** minimise construction waste, integrate recycling and waste management.
5. **Materials:** responsibly sourced and low embodied carbon materials.
6. **Pollution:** reduce light and noise pollution, control surface water runoff.
7. **Transport:** cycle parking, public transport and EV charging points.
8. **Land use and energy:** biodiversity protection, green roofs.
9. **Management:** robust commissioning, handover, and monitoring procedures.
10. **Innovation:** use of new sustainable technologies beyond standards.



Corporate influence

Procurement

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement**
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
- References

[Download and print the laboratory signage](#)

Procurement primarily impacts scope 2 and 3 emissions for life sciences companies, and is generally harder to impact for small companies. However, through efficient inventory management, co-ordinated deliveries, and putting pressure on suppliers to provide life cycle assessments (LCAs), procurement decisions can significantly impact carbon emissions and reduce waste for laboratories.

Supply Chain Sourcing

Cost	Ease	Impact
£		

KEY ACTIONS:

- Request **co-ordinated deliveries** with **local institutions** and companies to reduce transport emissions and buy in bulk where feasible.
- **Buy locally** and from recycling schemes where possible.
- Use or request [ACT labels](#) from suppliers to identify sustainable lab products with a third party verified Ecolabel.
- Prioritise **local shipments** and consolidate to **fewer suppliers** where possible to reduce packaging material and shipping frequency.
- Choose and request **low-impact recycled or reduced size packaging**, or alternative formulation such as tablet form of reagents such as PBS to reduce transport emissions.
- **Use inventory management systems** to consolidate purchases and e-lab books to track consumption.
- **Share consumables and equipment** between research groups to minimise overstocking and unnecessary purchases and avoid consumables going out of date.
- Encourage **proper experiment planning**
 - Create a culture where lab users check their stocks in advance rather than the day before or even on the day of their planned experiment.
 - This avoids last minute buying and ensures experiments are not delayed due to lack of reagents
- **Request LCAs on products.**
 - For smaller suppliers, LCAs are expensive and may not be available.
 - In this case, it is worth considering the proximity of your supplier and whether the goods will be transported further.

Inventory management

Encouraging the use of electronic lab books enables efficient tracking of inventory consumption, reduces paper use in labs and identifies efficient lab members who set best practices in lean consumption of lab consumables as a route to minimising waste and cost.

Cost	Ease	Impact
£+		

KEY ACTIONS:

- **Move to an inventory management system** to track consumption and purchasing.
 - This can streamline the purchasing process, enabling planning and repeat orders.
- Platforms such as [LabGuru](#), [eLabNext](#) and [SciNote](#) integrate **electronic lab notebooks** with inventory management, providing a centralised hub for experiments and supplies.
- [Quartz](#), [Genemod](#) and [LabArchives](#) offer lab inventory management systems.
- [FreezerPro](#) is an effective biobank and freezer sample management platform enabling optimisation of freezer space.

Corporate influence

Training and ownership

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence**
- Laboratory buildings
- Procurement
- Training & Ownership**
- Biodiversity action
- Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

To achieve a sustainable, long-term reduction in carbon emissions and environmental impact, leadership teams must position sustainability as a core function of their laboratory practice and product design. With senior buy-in, the entire company can feel empowered to act, and the responsibility to reduce, reuse and recycle will better permeate through teams.

Appointing a sustainability ambassador in a laboratory setting is a simple yet powerful way to drive environmental improvements from within. Providing opportunities to lead on sustainability schemes provides personal development opportunities for teams, and strengthens an organisation's long-term resilience and reputation and is likely to be attractive to top talent ^[1].

Cost	Ease	Impact
-	👍👍	🌱🌱🌱🌱

KEY ACTIONS:

- **Elect a dedicated individual or team** to champion sustainable practices in the organisation.
- **Request lab providers** in buildings to co-ordinate a sustainability panel from tenants in your building.
- **Empower staff** to act as sustainability ambassadors within their teams.
- **Drive bottom-up environmental change** through daily habits and peer influence.
- **Improve compliance with existing sustainability standards** (e.g. ISO 14001, LEAF, My Green Lab).
- **Identify and communicate local opportunities** for energy, waste and resource efficiency.
- You can also **sign up** to the [My Green Lab Ambassador Program](#) which is designed for laboratory professionals to encourage their lab to be more sustainable through free online learning programs.

LBIC's environmental champion scheme in laboratory buildings

LBIC, a wholly owned subsidiary of Royal Veterinary College, has developed a sustainability ambassador scheme with its tenants. The scheme increases company focus on sustainability through an internal environmental champion, and promotes social activity and pre-competitive collaboration between companies in the same building.

- All companies nominate one environmental champion to join meetings and an information sharing network.
- Training and education around lab-based sustainability is provided by LBIC staff.
- Companies can then co-ordinate and influence suppliers to the building through combined asks for sustainable products, pooled ordering and transport co-ordination.



Corporate influence

Biodiversity action



- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence**
- Laboratory buildings
- Procurement
- Training & Ownership
- Biodiversity action**
- Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Companies can introduce corporate schemes which promote employee leadership and responsibility in environmental sustainability, as well as making financial contributions and volunteering high value skills in appropriate ways to address environmental sustainability. Buy-in from leadership influences the whole company's impact on sustainable practices.

Cost	Ease	Impact
£	👍👍👍👍	🌱

KEY ACTIONS:

- **Co-ordinate and communicate about volunteering days** to drive team building within your organisation.
- **Work with local environmental charities** to contribute to understand how employee skill sets can contribute to environmental sustainability efforts.
- **Celebrate the impact** of conservation efforts made by the team.
- **Encourage environmentally-focussed investments** for profit-generating SMEs to make a positive impact on the environment.

These programmes allow teams to directly contribute to improving London's biodiversity, aligning company values with local environmental impact while offering **engaging team activities**:

- **London Wildlife Trust:** with locations across London, employees can support habitat management, pond maintenance, species monitoring and tree planting.
- **Thames21:** Thames foreshore and tributaries river and wetland clean-ups removing plastic pollution, invasive species management and reed bed restoration.
- **The Conservation Volunteers:** locations across London supporting wildlife habitat creation, wildflower planting and woodland management.
- **Trees for Cities:** urban tree planting and care supporting biodiversity in city environments.
- **London National Park City Foundation:** supporting local greening projects, biodiversity mapping and citizen science.

1% for the Planet

1% for the Planet is a global initiative that enables businesses to demonstrate environmental responsibility by committing 1% of their annual sales to support vetted environmental nonprofit organizations.

Full Circle Labs have invested in this scheme, to support their collective mission to positively impact the planet through their operations.

- Businesses can choose from three membership levels: full company, brand, or product line, to align with their operational structure.
- Members donate 1% of annual sales directly to approved environmental partners.
- Members submit annual revenue and donation documentation for third-party verification, ensuring transparency and credibility.
- Members leverage the 1% for the Planet logo and network to communicate their commitment and engage with a community of like-minded organisations.

Corporate influence

Carbon offsetting

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage

Once companies have reduced the carbon emissions they can, to achieve net zero emissions, they are required to offset the remaining emissions through carbon capture schemes.

Cost	Ease	Impact
££	👍👍👍👍	🌱

KEY ACTIONS:

- **Focus on reducing emissions** as much as possible by following other actions in this report.
- Only look to **offset a maximum of 10%** of emissions ^[18] in a net zero environment.
- **Choose trusted suppliers** who are able to offset the remaining 10% of emissions.

Carbon Compared

Life sciences laboratories inevitably will always have residual emissions despite their best efforts at reduction. However, smaller enterprises typically lack the resources to engage specialised carbon consultants or conduct extensive due diligence processes.

Carbon Compared addresses this gap as a comprehensive, free platform delivering rigorous carbon credit analysis and comparison tools specifically designed to reduce barriers to retiring credits. SMEs are then able to identify high-integrity credits aligned with their sustainability objectives.

Carbon credits must serve as a strategic complement to, not a substitute for, rigorous decarbonisation efforts. They must never be used as a licence to emit.

The current SBTi standard requires companies to neutralise any residual emissions upon meeting a long-term science-based target. Carbon removal credits are an option for neutralising these.

During the decarbonisation journey toward net zero, high-integrity carbon avoidance credits may support interim carbon neutrality goals, before transitioning to carbon removal credits once deep emissions reductions have been achieved.

As demand for high-quality credits continues to rise, securing carbon removal credits now can provide a hedge against future price increases. Long-Term Offtake agreements are an effective strategy to lock in favourable pricing and secure a recurring supply of credits.



Why are London's Life Sciences SMEs investing in sustainable practices?

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)



An Interview with Mia Fukino, Scientist, Full Circle Labs

How have you approached sustainability and environmental impact at Full Circle Labs?

Environmental stewardship is not an add-on for us at Full Circle Labs; it is deeply embedded in our core values and operations. We believe we have a responsibility not only to our colleagues and communities but to the natural ecosystems we depend on. We continuously work to minimise our environmental impact by reducing packaging, recycling wherever possible, and choosing suppliers who share our commitment to sustainability.

Through RecycleLabs, we are able to recycle 98% of our lab single-use plastics, e.g. tips, tubes and plates. All soft plastic waste that comes from our consumers and suppliers is responsibly recycled in partnership with FirstMile. Lastly, we've developed reusable sample bags to reduce new single-use packaging altogether and support a fully circular economy. Customers send their samples in these bags, we process the samples, and return the now empty bags back into circulation for repeated use.

We are proud members of 1% for the Planet and dedicate at least 1% of our annual revenue to Fundación Montecito, a grassroots organisation in Colombia. With our support, Felipe (Director of Fundación Montecito) has built a studio by Lago de Tota (Boyacá), Reserva Natural Xieti. This studio aims to empower the next generation to value and protect their environment by providing education to the local children on the importance of biodiversity conservation.

Through every decision we make, we strive to ensure that our scientific operations not only advances knowledge but also protects and preserves the planet for future generations.

How early can businesses start thinking about sustainability in the lab?

As scientists, it would be ignorant of us to turn a blind eye to the urgent threat our natural environment is facing. Sustainability should be embedded into lab operations from day one. The earlier businesses begin considering their environmental impact, the easier it is to build sustainable practices into their operations, supply chains, and culture.

At Full Circle Labs, we've learned that even small choices early on, like selecting reusable materials or choosing energy-efficient equipment, can have a long-term impact on reducing emissions and waste.

Addressing Scope 1 and 2 emissions (direct and energy-related) is more straightforward, especially if you're in control of your facilities. Choosing energy-efficient lighting, minimising travel, and improving operational efficiency all help. Scope 3 emissions (usually emitted across the supply chain) are more complex, but not impossible to influence. They require transparency, strong relationships with vendors, and a commitment to responsible procurement.

The challenge lies in balancing scientific innovation with environmental responsibility, but this is not only possible - it's necessary. The lab sector can't afford to treat sustainability as an afterthought. We have a responsibility to lead with integrity and create systems that support both progress and the planet.

Why are London's Life Sciences SMEs investing in sustainable practices?

- Actions matrix**
- Benchmarking**
- Energy reduction**
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

How can life sciences businesses think differently about product and service design to minimise carbon impact and benefit financially?

Life sciences businesses can reduce carbon impact and gain financial value by embedding sustainability into product and service design from the start. At Full Circle Labs, we recommend fully mapping your business model to understand how products are designed, made, used, and disposed of. Thus identifying carbon hotspots and opportunities for sustainable alternatives. This includes everything from material choices and packaging to logistics and end-of-life solutions.

Equally important is where you set up operations. Choosing facilities with sustainability accreditations, such as My Green Lab or LEAF, can help reduce Scope 2 and 3 emissions. These certifications are becoming increasingly essential, with funders like Wellcome Trust and Cancer Research UK requiring them by 2026.

Engaging accredited suppliers and vendors further extends your sustainability impact across the value chain. Finally, set up carbon tracking systems from day one. Early measurement creates accountability, informs smarter decisions, and positions your business to adapt to future regulatory and funding requirements.

Sustainable design isn't just good for the planet, it reduces waste, builds resilience, and enhances long-term profitability. By taking a systems-level view from the outset, life sciences businesses can lead innovation that benefits both people and the environment.

What are your future plans to continue improving your carbon footprint as Full Circle Labs grows?

We're actively brainstorming how we can make our services greener, and continuously strive to be better, specifically:

- Our immediate priority is phasing our reusable sample bags into more locations, with the final goal of ensuring that no new, unnecessary plastics are used by customers to ship us their samples.
- We're considering partnering with a new recycling service that can directly convert our plastic waste directly into useful lab products that we can then use.

We're working on improving awareness around our sustainable practices, and putting pressure on both our peers within the scientific services industry, and scientists purchasing our services, to consider a company's sustainable practices when choosing a vendor. We know grant budgets can be very tight, but think it's everyone's responsibility within the sector to keep each other accountable.



Why are London's Life Sciences SMEs investing in sustainable practices?

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
- Full circle labs
- [Purcell global ltd](#)
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- Download and print the laboratory signage



An Interview with Nicholas Purcell, CEO of Purcell Global Ltd

Can you tell us a bit about your company and your products?

Purcell is building the next generation of connected medical devices focused on diagnostics, treatment, and remote patient monitoring. Our mission is to radically reduce the time to diagnosis and treatment for respiratory and systemic conditions.

We're currently developing two core products: InhalerPro™, a reusable, tech enabled smart inhaler platform, and BioPro+™, a purse-sized diagnostic device capable of multimodal health screening.

Both are being designed to integrate with TherapyPro™, our AI-SaMD (Software as a Medical Device) platform, which is being developed to provide personalised, data-driven insights across the entire patient journey.

Why have you taken an in-silico approach to product development?

We're a bootstrapped team, so we've had to be clever with how we test and build. Using digital twins of our devices and patient physiology, we can explore how both the device and the drug behave before anything goes into a real-world trial. It helps us move faster, cut waste, and spot issues early before they show up in the real world.

More importantly, it gives us a feedback loop. Once the devices are out there, we'll see how they perform in the hands of real users, compare that with our simulations, and make informed updates that reflect what patients need. That's how we close the gap between what's designed and what's delivered.

Have you found that your sustainability-first approach has opened doors with investors, partners, or customers?

We haven't seriously spoken to investors for a couple of years, although when we did, sustainability was already a major point of interest. Since then, our sustainability-first approach has resonated with CDMOs, pharma contacts, and our wider team. While sustainability hasn't always been a central theme in early-stage MedTech, that is changing.

Our partners increasingly view it not just as a value, but as a practical lever for how we design, engage, and stand apart in the long run. Our emphasis on reusability, digital-first workflows, and efficient design aligns with their priorities, particularly around lifecycle impact, regulatory readiness, and responsible innovation.

How did you approach product design to balance sustainability and regulatory requirements?

In respiratory health, most devices are disposable or designed for short-term use. We set out to change that, creating something people relate to, like a wearable or a pair of glasses. Not purely for sustainability, but to elevate the emotional connection people have with their health tools.

Why are London's Life Sciences SMEs investing in sustainable practices?

Actions matrix
Benchmarking
Energy reduction
LED lighting
HVAC System
Freezers
Switch Off & Efficiency
Consumables waste management
Waste Segregation
Plastics: Reduce
Plastics: Reuse
Plastics: Recycle
Solvent choice
Non-consumables waste management
Water consumption
Equipment reuse
Corporate influence
Laboratory buildings
Procurement
Training & Ownership
Biodiversity action
Carbon offsetting
Why SME's invest in sustainability?
Full circle labs
Purcell global ltd
Frameworks to follow
Summary
Resources
ISO14001 Checklist
ISO50001 Checklist
Tenant sustainability checklist
References
Download and print the laboratory signage

InhalerPro™ is being developed to be medication-agnostic and reusable, with replaceable parts that maintain hygiene and performance. BioPro+™ is being developed to bring advanced diagnostics out of the lab and into people's hands. Being compact and portable and meant to go wherever the patient is. That reduces the need for repeated clinic visits or lab testing. For both devices, we've chosen recyclable, biocompatible materials and kept packaging minimal without sacrificing safety. We're also building in harmonised regulatory alignment from the outset to ensure patient safety and compliance at every level.

How do you balance sustainability in your priorities as a startup with limited resources?

For us, sustainability and resourcefulness aren't separate ideas, they're two sides of the same coin. Being bootstrapped means we've had to think differently, and that's forced us to be more creative with how we design, test, and move forward. We are using in-silico methods to reduce trial-and-error, source modular, off-the-shelf components to minimise waste and early-stage costs, and involving our regulatory network early to align our designs with international compliance frameworks.

We also collaborate with universities on real-world projects to extend our capabilities, collaborating with Northeastern on regulation and clinical trial planning, with ASU on engineering and in-silico work, and with NOVA SBE on advanced AI. We're not interested in building things that just tick boxes. If a design doesn't meet our bar for performance or compliance, we scrap it, simple as that! But we also challenge ourselves to go further: is there a leaner way to do this? Can we reduce materials? Cut waste? Build something that works better over time?

For us, that's just part of the job. It's not only about developing devices, it's about investing in the next generation of engineers and thinkers who'll carry this work forward.

How are you thinking about sustainability across the full lifecycle of your products?

We see sustainability as something that spans the whole journey, from how we source materials to how the product is used, and eventually, how it's retired or reused. It's not just about the materials, but how everything fits together. Our remote-first development model reduces travel, lab waste, and physical infrastructure needs. Devices are being designed for durability, upgradability, and reusability, not disposability.

While our lifecycle strategy is still evolving, we're already engaging with CDMOs to help reshape it. A key part of this includes a careful review of materials to balance biocompatibility, performance, and environmental impact. We prioritise biodegradable and recyclable options wherever we can. For example, using aluminium for most structural components due to its durability and full recyclability, and bioplastics for parts that come into contact with the body.

We believe these devices should last for years, not just a month. It's not just about DME classification; it's about creating long-term connection between the patient and their device. We think medical devices should feel personal. If something becomes part of your daily routine like glasses, a glucose monitor, or a smartwatch, it shouldn't feel disposable. It should feel like yours. That kind of connection encourages better engagement and care continuity.

Although we're still refining the full picture, the direction is clear: develop sustainable systems that improve over time and are aligned with both patient needs and long-term environmental responsibility. We're not here to make a throwaway device. We're here to shift expectations toward something durable, connected, and worth keeping.

Available frameworks to follow

- Actions matrix
- Benchmarking
- Energy reduction
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management
 - Water consumption
 - Equipment reuse
- Corporate influence
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow
- Summary
- Resources
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

Choosing your framework:

Frameworks like Laboratory Efficiency Assessment Framework (LEAF), My Green Lab and ISO certifications provide structured, measurable ways to reduce energy use, cut carbon emissions, manage waste and improve procurement and operational practices in laboratories.

Adopting these standards helps companies to:

- Meet NHS and public sector procurement requirements.
- Demonstrate accountability to funders and grant bodies.
- Reduce operational costs and environmental risks.
- Attract sustainability-conscious employees and partners.

Standard	LEAF	My Green Lab	ISO 14001 Environmental management	ISO 50001 Energy management
Scope	Lab-specific, action-based across 10 categories	Lab-level operations across 14 sustainability themes	Org-wide environmental compliance system	Org-wide energy performance system
Certification	In person peer review supported by auditing training to ISO19011 standard. External peer-review possible	Third-party audited	Formal certification with audits	Formal certification with audits
Sectors	Publicly funded organisations	Academia, biotech, pharma, healthcare	All industries	All industries
Granularity	High: narrative-based responses to demonstrate compliance with criteria and optional calculators as evidence	High: detailed across categories with scores and feedback	Systems-focused	Systems-focused
Cost	Low: sliding scale based on institutional research income/employee count	Moderate to high (depends on lab size and scale)	Medium to high	Medium to high
User-friendliness	Strong: very simple for lab users, no prior knowledge required	Strong: tailored to lab teams, accessible language	Weaker: process-led, formal language	Weaker: focused on data and systems
Strengths	Accessible, great for engagement and quick wins	Globally recognised, detailed lab insights, behaviour and systems	Strategic governance, compliance	Strategic energy management
Carbon accounting link	No formal carbon framework, calculators available to estimate emissions and savings	Yes: aligned with UN Race to Zero, supports carbon reporting	Partial: may support scope 1/2/3 tracking	Yes: supports energy footprint tracking
Best for:	You're an academic institution aiming for practical lab engagement. Organisations seeking a low-cost, practical sustainability tool.	You're a biotech or pharma company aiming for UN Race to Zero compliance. Labs wanting a science-based, lab-specific certification that ties into global climate goals.	You need to demonstrate regulatory environmental compliance at an organisational level. Organisations that need a full EMS framework for compliance, auditing and risk management.	You want to improve energy efficiency and reduce costs across sites or campuses. Institutions with significant energy use and strategic energy goals.

Available frameworks to follow

- Actions matrix**
- Benchmarking**
- Energy reduction**
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

LEAF

LEAF is a sustainability certification framework developed and managed by University College London (UCL) specifically for wet laboratories. While its primary user base – academia and research-intensive institutions such as Oxford, Cambridge and Imperial – are in the UK and Europe, UCL also licenses the programme across the world.

Despite being only licensed to public sector organisations, SMEs interested in licensing LEAF should contact the team on LEAF@ucl.ac.uk to discuss their requirements. LEAF alignment for spin-out labs and startups would be an excellent baseline for establishing sustainable initiatives in commercial labs.

Each level of LEAF includes practical actions, such as:

Bronze	Silver	Gold
<ul style="list-style-type: none"> Shut the sash signage for fume cupboards. Waste segregation and correct labelling including recycling. Cold storage maintenance including regular filter cleaning. Procurement policies that prioritise energy-efficient equipment. Samples owned by departing staff are cleared or tracked. Common labelling systems in place. Equipment is turned off when not in use. Signposting for staff training on sustainability. Appointing a green lab rep or champion. 	<ul style="list-style-type: none"> Implementing water-saving technologies (e.g. vacuum pumps over aspirators). Reduction of single-use plastics with alternatives trialled. Collaboration with lab users to improve shared equipment use. 	<ul style="list-style-type: none"> Quantified carbon savings based on lab improvements. Lab-specific LCA or environmental impact assessments. Inter-lab knowledge sharing (e.g. presenting findings or creating SOPs). Excess equipment is repaired, sold, and/or donated. At least 80% of samples and/or chemicals are catalogued and in use. Consideration forand reduction of impact of business travel. Piloting new sustainable methods or equipment. Integration with wider institutional sustainability strategies

My Green Lab

My Green Lab (MGL) is an internationally recognised sustainability certification tailored specifically for laboratories. It originated in the US but is now used globally in industry, academia and healthcare (including pharma companies such as AstraZeneca, Genentech and GSK). My Green Lab has over 4000 certified labs, and requires high levels of participation in surveys across the whole lab to effect sustainable lab culture change. My Green Lab provides substantial online resources for lab leads and an easy to use web based platform for certification management.

There are five levels of certification: bronze, silver, gold, platinum, and green. The level of certification is determined by the score on the certification assessment. It reflects both the percentage of possible green lab best practices that have been adopted and the extent to which they have been adopted by the lab.

ISO 14001

ISO 14001 is the international standard for environmental management systems (EMS). It provides a structured framework for organisations to systematically manage their environmental responsibilities and improve sustainability outcomes.

ISO 14001 revolves around the Plan-Do-Check-Act (PDCA) cycle, which offers a scalable and effective framework for embedding sustainability into laboratory environments. [See checklist for ISO 14001 in the appendix.](#)

ISO 50001

ISO 50001 is energy-specific and focused on reducing energy use and improving energy performance through a structured management system. It is especially relevant where equipment-heavy or energy-intensive processes are involved. See checklist for [ISO 50001 in the appendix.](#)

Summary

Actions matrix
Benchmarking
Energy reduction
LED lighting
HVAC System
Freezers
Switch Off & Efficiency
Consumables waste management
Waste Segregation
Plastics: Reduce
Plastics: Reuse
Plastics: Recycle
Solvent choice
Non-consumables waste management
Water consumption
Equipment reuse
Corporate influence
Laboratory buildings
Procurement
Training & Ownership
Biodiversity action
Carbon offsetting
Why SME's invest in sustainability?
Full circle labs
Purcell global ltd
Frameworks to follow
Summary
Resources
ISO14001 Checklist
ISO50001 Checklist
Tenant sustainability checklist
References
Download and print the laboratory signage

Checklist of key tactics in this report:

- [Benchmarking](#) : establish a baseline of current emissions and resource consumption to identify high-impact areas and track progress regularly.
- [Energy reduction](#) :
 - Implement strict “equipment switch-off” protocols for non-essential apparatus when not in use.
 - Ensure fume hood sashes are lowered to reduce energy consumption.
 - Optimize ULT freezers to -70°C where appropriate to save significant energy.
 - Choose buildings with high energy efficiency and consider renewable energy suppliers.
- [Waste management and plastics reduction](#) :
 - Prioritise **reduction** of single-use plastics through tactics such as using reusable glassware, choosing suppliers with less packaging and share consumables between labs where possible.
 - Actively **reuse** items where safe and practical, such as old solvent bottles for waste.
 - Engage with **take-back schemes** for packaging (e.g. polystyrene, tip boxes) and plastics recycling services.
 - Implement clear, segregated recycling bins across all lab spaces.
- [Water conservation](#) :
 - Install low-flow aerators and utilise technologies such as Findensers instead of water condensers. Replace water aspirators with more efficient vacuum pumps.
 - Promote behavioural change to minimise the use of ultrapure water unless strictly necessary.
 - Run autoclaves only at full capacity and on a scheduled basis.
- [Environmental impact and green chemistry](#) :
 - Select less hazardous solvents and reduce overall solvent use, using lab dishwashers for cleaning where possible.
 - Consider generating gases on-site (e.g., hydrogen) to reduce reliance on cylinders.
- [Sustainable procurement](#) :
 - Request Life Cycle Assessments (LCAs) from suppliers for products and prioritise those with lower carbon footprints.
 - Buy locally and consolidate orders to minimise transport emissions and packaging.
 - Choose products with recycled content, reduced packaging, or alternative formulations (e.g. tablet form reagents)
- [Inventory management](#) :
 - Implement inventory management systems (e.g. LabGuru, Quartzly, LabCup) to track consumption, reduce overstocking and minimise waste
 - Encourage the use of electronic lab notebooks to streamline tracking and identify efficient practices.
 - Secure senior leadership buy-in to embed sustainability as a core organisational value.
 - Support local biodiversity initiatives through employee volunteering programmes.
 - Appoint internal “Sustainability Ambassadors” to champion green practices and drive bottom-up change.
 - Provide training opportunities on sustainable practices and frameworks such as LEAF, My Green Lab, and ISO 14001 or Green DiSC.

Summary

- Actions matrix**
- Benchmarking**
- Energy reduction**
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
- [Download and print the laboratory signage](#)

Acknowledgements

We would like to sincerely thank the many experts who have contributed to and reviewed this report. Our sincere thanks go to the VWV team for their organisation of the PING conference on sustainability in biopharma, and Andrew Griffiths from Planetmark, Allison Hunter from Imperial, Caitlin Broadbent from UCL LEAF, and Césaré Cejas from mfx bio for their review and support of this publication, as well as all those who contributed to the survey and case studies enclosed.



By aligning operational excellence with environmental responsibility in the research space we use, and by making those considerations in what we buy, how we use it and remove it, this report exemplifies how sustainability and science can thrive together across the whole Life Sciences ecosystem: academia, pharma, NHS, SMEs and innovation.

Allison Hunter, Head of Technical Operations, Life Sciences, Imperial



If you would like to know more about what we do and how we work, please contact us or send us a message at:

medcitycomms@londonandpartners.com

or visit our website:

medcityhq.com

Actions matrix
Benchmarking
Energy reduction
LED lighting
HVAC System
Freezers
Switch Off & Efficiency
Consumables waste management
Waste Segregation
Plastics: Reduce
Plastics: Reuse
Plastics: Recycle
Solvent choice
Non-consumables waste management
Water consumption
Equipment reuse
Corporate influence
Laboratory buildings
Procurement
Training & Ownership
Biodiversity action
Carbon offsetting
Why SME's invest in sustainability?
Full circle labs
Purcell global ltd
Frameworks to follow
Summary
Resources
ISO14001 Checklist
ISO50001 Checklist
Tenant sustainability checklist
References
Download and print the laboratory signage

ISO 14001 Lab Sustainability Checklist

Environmental policy and commitment

- Lab has a documented environmental policy specific to lab operations.
- Policy includes commitments to compliance, pollution prevention and continual improvement.
- Staff are aware of the policy and understand their role in meeting objectives.

Planning

Identification of environmental aspects and impacts

- Environmental aspects of lab activities are identified, (eg energy, waste, chemicals).
- Impacts are assessed (eg carbon emissions, pollution, resource depletion).

Legal and other requirements

- Relevant environmental regulations are identified and reviewed regularly.
- Lab activities are compliant with local and national environmental laws (eg REACH, COSHH, waste disposal).

Objectives, targets and progress

- Specific, measurable environmental objectives are set (eg reduce single-use plastics by 20%).
- A plan exists to achieve and review progress toward these objectives.

Implementation and operation

Roles and responsibilities

- Environmental responsibilities are assigned (eg, lab sustainability officer or champion).
- Staff roles in sustainability are included in onboarding or job descriptions.

Competence, training and awareness

- Staff receive regular training on sustainable lab practices and ISO 14001 principles.
- Engagement programmes or campaigns are run (eg, "Shut the Sash").

Communication

- Lab communicates environmental objectives and progress to internal and external stakeholders.
- Mechanisms exist for reporting environmental incidents or suggestions.

Documented information

- SOPs include sustainability measures (eg waste segregation procedures).
- Lab has an accessible environmental management folder or intranet page.

Operational control

Waste management

- Waste streams are clearly labelled and separated (eg biohazard, chemical, recyclable).
- Participation in lab recycling schemes (eg, TerraCycle, Zero Waste Box).
- Waste reduction strategies are in place (eg bulk ordering, reuse systems).

Energy use

- Lab equipment is energy-rated or low-consumption where possible.
- Sash hoods are closed when not in use; airflow monitored.
- Lighting and HVAC are controlled with timers or occupancy sensors.

Water use

- Use of waterless condensers or vacuum systems where feasible.
- Deionised water use is monitored and minimised.

Chemical and material management

- Inventory system in place to track stock and reduce over-ordering.
- Safer or greener alternatives evaluated regularly.
- Out-of-date chemicals are identified and disposed of properly.

Procurement and equipment

- Sustainability is considered in purchasing decisions.
- Equipment maintenance is scheduled to ensure efficiency.
- Shared equipment is encouraged to reduce duplication.

Performance evaluation

- Environmental performance is tracked via KPIs (eg energy usage, waste volumes).
- Regular internal environmental audits are conducted.
- Non-conformities and areas for improvement are documented.

Improvement

- Corrective and preventive actions are taken for any environmental incidents.
- Lab reviews environmental objectives annually.
- Staff are encouraged to propose and test new sustainability ideas.

Optional add-ons

- Lab has joined a green lab certification scheme (eg LEAF, My Green Lab).
- Environmental achievements are publicly shared (eg website, newsletters).
- Collaboration with other labs to share sustainability best practices.

Actions matrix
Benchmarking
Energy reduction
LED lighting
HVAC System
Freezers
Switch Off & Efficiency
Consumables waste management
Waste Segregation
Plastics: Reduce
Plastics: Reuse
Plastics: Recycle
Solvent choice
Non-consumables waste management
Water consumption
Equipment reuse
Corporate influence
Laboratory buildings
Procurement
Training & Ownership
Biodiversity action
Carbon offsetting
Why SME's invest in sustainability?
Full circle labs
Purcell global ltd
Frameworks to follow
Summary
Resources
ISO14001 Checklist
ISO50001 Checklist
Tenant sustainability checklist
References
Download and print the laboratory signage

ISO 50001 in a lab environment checklist

Energy policy

- Lab has a documented energy policy.
- Policy includes commitment to continual improvement in energy performance and compliance with legal/other requirements.
- Energy objectives are integrated into lab planning.

Energy planning

- Baseline energy usage established (eg annual kWh use).
- Significant energy uses (SEUs) identified (eg fume hoods, freezers, autoclaves).
- Energy performance indicators (EnPIs) defined (eg kWh/experiment, kWh/FTE).
- Clear energy objectives and targets are documented and monitored.

Legal and other requirements

- Lab complies with relevant energy legislation.
- Relevant incentive programmes and certifications (eg BREEAM, EPC) are identified.

Energy review

- Historical energy data collected and analysed (electricity, gas, HVAC).
- Patterns or anomalies in energy use are reviewed regularly.
- Opportunities for energy performance improvement are documented.

Operational controls

- Sash fume hoods are managed using automated airflow systems or signage.
- Energy-efficient equipment is procured based on life cycle energy cost.
- Freezer management practices in place (eg, defrost schedules, consolidated storage).
- Equipment is switched off or powered down when not in use.
- Lighting uses occupancy sensors or LED systems.

Design and procurement

- Energy efficiency considered in equipment/lab space design.
- Energy performance criteria used in procurement decisions.

Monitoring, measurement and analysis

- Energy consumption is monitored at lab, floor or equipment level.
- Smart meters, sub-meters or building management systems (BMS) are used.
- Trends are analysed and reported.

Internal audit

- Regular energy audits conducted by trained personnel.
- Performance compared to baseline and targets.

Non-conformity and corrective action

- Deviations from energy performance targets are investigated.
- Corrective actions documented and tracked.

Management review

- Senior management reviews energy performance data and policy annually.
- Opportunities for improvement or investment are assessed.

- Actions matrix**
- Benchmarking**
- Energy reduction**
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - [Tenant sustainability checklist](#)
 - References
- [Download and print the laboratory signage](#)

Tenant’s checklist for a sustainable laboratory space

- The building is certified under any sustainability frameworks e.g. BREEAM, LEED, WELL, NABERS)
- You know the building’s current EPC (Energy Performance Certificate) rating
- Energy sourced from renewable sources (supplier or onsite)
- Energy consumption is monitored and reported with sub-meters and tenant access to monthly usage
- You know the efficiency of the HVAC units, they are updated and energy efficient
- Reactive HVAC units are installed
- The HVAC system has heat recovery or free cooling
- There is insulation, glazing, or passive design to support energy efficiency
- Water usage is monitored and reported to tenants with sub-meters
- Low-flow or sensor-controlled water fixtures installed
- There is a greywater or rainwater harvesting system
- Fume cupboards are variable air volume not constant air volume
- There is a cold-storage management policy and energy efficient freezers are used
- There is shared access to energy-intensive equipment such as autoclaves, glasswashers, centrifuges
- There are occupancy sensors
- Energy efficient and sensor lighting installed
- There are waste segregation and recycling systems in place for relevant waste streams
- There is access to specialist recycling for polystyrene, PPE, solvents, lab plastics
- The operator is aligned with ISO 14001 and ISO 50001 standards
- There is a net zero strategy for the building
- There are tenant sustainability initiatives such as shared dashboards, green forums, volunteering, urban greening

References

- Actions matrix**
- Benchmarking**
- Energy reduction**
 - LED lighting
 - HVAC System
 - Freezers
 - Switch Off & Efficiency
- Consumables waste management**
 - Waste Segregation
 - Plastics: Reduce
 - Plastics: Reuse
 - Plastics: Recycle
 - Solvent choice
- Non-consumables waste management**
 - Water consumption
 - Equipment reuse
- Corporate influence**
 - Laboratory buildings
 - Procurement
 - Training & Ownership
 - Biodiversity action
 - Carbon offsetting
- Why SME's invest in sustainability?**
 - Full circle labs
 - Purcell global ltd
- Frameworks to follow**
- Summary**
- Resources**
 - ISO14001 Checklist
 - ISO50001 Checklist
 - Tenant sustainability checklist
 - References
-  **Download and print the laboratory signage**

[1] British Business Bank. Benefits of ESG for Small Businesses. [n.d.] Available at: <https://www.british-business-bank.co.uk/business-guidance/guidance-articles/sustainability/what-are-the-benefits-of-sustainability-for-smaller-businesses> Accessed July 2025

[2] My Green Lab. The Carbon Impact of Biotech & Pharma. [2023] Available at: https://www.mygreenlab.org/uploads/2/1/9/4/21945752/2023_carbon_impact_of_biotech_and_pharma_report.pdf Accessed July 2025

[3] Gov.UK. Bioscience and health technology sector statistics 2021 to 2022 [May 2024]. Available at: <https://www.gov.uk/government/statistics/bioscience-and-health-technology-sector-statistics-2021-to-2022/bioscience-and-health-technology-sector-statistics-2021-to-2022> Accessed July 2025

[4] GOV.UK. MHRA approves world's first low-carbon version of COPD inhaler Triexo Aerosphere [May 2025]. Available at: <https://www.gov.uk/government/news/mhra-approves-worlds-first-low-carbon-version-of-copd-inhaler-trixeo-aerosphere> Accessed July 2025

[5] The Pharmaceutical Journal. Green inhalers could make up to 10% of NHS net zero emissions cuts, report concludes [March 2025]. Available at: <https://pharmaceutical-journal.com/article/news/greener-inhalers-could-make-up-to-10-of-nhs-net-zero-emissions-cuts-report-concludes> Accessed July 2025

[6] The State of Carbon Dioxide Removal. The State of Carbon Dioxide Removal, 2nd Edition [2024]. Available at: <https://www.stateofcdr.org/> Accessed July 2025

[7] World Meteorological Organisation. Record carbon emissions highlight urgency of Global Greenhouse Gas Watch [2024]. Available at: [https://wmo.int/media/news/record-carbon-emissions-highlight-urgency-of-global-greenhouse-gas-watch#:~:text=Total%20carbon%20dioxide%20\(CO2\)%20emissions,to%20the%20Global%20Carbon%20Budget](https://wmo.int/media/news/record-carbon-emissions-highlight-urgency-of-global-greenhouse-gas-watch#:~:text=Total%20carbon%20dioxide%20(CO2)%20emissions,to%20the%20Global%20Carbon%20Budget) Accessed July 2025

[8] NHS England. Greener NHS Areas of Focus [n.d.]. Available at: <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/areas-of-focus/#:~:text=Medicines%20account%20for%20about%2025,Estates%20and%20facilities> Accessed July 2025

[9] British Medical Association. More support needed to help the NHS reach net zero [June 2024]. Available at: <https://www.bma.org.uk/what-we-do/population-health/protecting-people-from-threats-to-health/more-support-needed-to-help-the-nhs-reach-net-zero#:~:text=The%20health%20service%20has%20an,of%20the%20public%20sector's%20emissions> Accessed July 2025

[10] NHS England. NHS Net Zero Supplier Roadmap [2023]. Available at: <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2024/04/NHS-Net-Zero-Supplier-Roadmap-2024.pdf> Accessed July 2025

[11] NHS England. Evergreen sustainable supplier assessment [2024]. Available at: <https://www.england.nhs.uk/nhs-commercial/sustainability/evergreen/> Accessed July 2025

[12] Lab Manager. Energy Improvements [2013]. Available at: <https://www.labmanager.com/energy-improvements-10613> Accessed July 2025

[13] Association of Laboratory Medicine. Decarbonising diagnostic laboratories [December 2023]. Available at: <https://labmed.org.uk/resource/decarbonising-diagnostic-laboratories-pdf.html> Accessed July 2025

[14] My Green Lab. Cutting Laboratory Plastic Waste: The Power of Reusable Consumables [2024]. Available at: <https://www.mygreenlab.org/blog-beaker/cutting-laboratory-plastic-waste-the-power-of-reusable-consumables> Accessed July 2025

[15] Watergate. Does saving water reduce my carbon footprint [August 2024]. Available at: <https://watergate.ai/blog/does-saving-water-reduce-my-carbon-footprint/#:~:text=The%20water%20consumed%20by%20a,%2C%20you're%20not%20alone> Accessed July 2025

[16] Wellcome. Concordat for the Environmental Sustainability of Research and Innovation Practice [2022]. Available at: <https://wellcome.org/who-we-are/positions-and-statements/environmental-sustainability-concordat> Accessed July 2025

[17] Cancer Research UK. Our Environmental Sustainability Strategy [2024]. Available at: <https://www.cancerresearchuk.org/about-us/our-organisation/responsible-organisation/our-environmental-sustainability-strategy> Accessed July 2025

[18] Science Based Targets. The Corporate Net-Zero Standard [2024]. Available at: <https://sciencebasedtargets.org/net-zero#:~:text=Early%20Action:%20The%20near-term%20target%20delivers%20immediate,reaching%20net-zero%20by%202050%20at%20the%20latest> Accessed July 2025



MEDCITY
LONDON

LONDON
& PARTNERS