From ambition to action: sustainability in the lab

Presented by

LAB INNOVATIONS

COLLABORATE

for a sustainable future

Sustainability in the sector: *An overview*

As the climate crisis deepens, laboratories are under growing pressure to reduce the environmental impact of the way they operate. That pressure is well founded: labs **can consume 5 to 10 times more energy per square metre than office buildings**, while laboratory research is estimated to **generate around 2% of global plastic waste**[1].

Against that backdrop, sustainability is no longer just a peripheral CSR concern. It is becoming **a core operational priority**, increasingly embedded in laboratory processes, practices and procurement. Customers, partners and funders are also placing increasing value on credible environmental action, with frameworks such as ISO 14001 helping organisations demonstrate structured environmental management. Organisations are expected not only to innovate, but to do so responsibly.

So, what does sustainability in the lab really mean? Across the sector, the focus is increasingly falling on **green chemistry, waste reduction, energy-efficient equipment, sustainable or bio-based consumables, lower-impact packaging, and carbon-conscious facilities.** A growing number of frameworks, accreditation schemes and internal initiatives are helping labs translate ambition into practical action, and this area is likely to see further development as policy, procurement standards and stakeholder expectations continue to evolve.

Yet progress remains uneven. Many sustainability efforts are still being led at team or organisation level, rather than through clear, joined-up standards across the sector. If the lab industry is to deliver meaningful change at scale, it will require not only innovation within individual laboratories, but greater collaboration across the wider ecosystem of labs, suppliers, institutions and regulators.

This report draws on industry research and expert voices to explore how sustainability is being defined in the lab sector today, where the biggest opportunities lie, where the key risks remain, and how parts of the sector are already beginning to define and deliver more sustainable practice.

[1] Freese, Thomas et al. "The relevance of sustainable laboratory practices." RSC sustainability vol. 2,5 1300-1336. 18 Mar. 2024.



Sustainability snapshot



Labs typically use 5-10 times as much energy as an office building (can be as high as 100 times!)



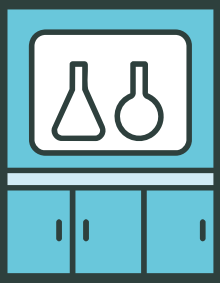
Bio scientific research produces ~5.5M tonnes of plastic waste annually (1.8% of global total)



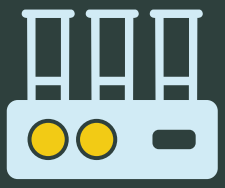
Laboratories often account for over 60% of a major research university's energy consumption.



Ultra-low temperature freezers can use as much energy as an average household every day.



Fume hoods can use as much energy as 3.5 homes per year when left running 24/7.



Heat blocks can use as much energy as a 50" TV per hour.[2,3]



Small water baths consume as much energy as a dishwasher every hour; large water baths use energy equivalent to a window air conditioner hourly.



[2] https://mygreenlab.org/resources/energy/

[3] https://www.techniciancommitment.org.uk/assets/__/rsa-2023/8-clare-rsc-sustainable-labs-opportunity.pdf?version=1695929805

Main drivers...

- **Environmental pressure is rising**

  Awareness of the sector footprint means labs are under growing pressure to reduce energy use, water demand, plastic and chemical waste, and emissions.

- **Sustainability is becoming a business expectation**

  Sustainability is no longer just a CSR issue, it is becoming part of operational best practice, procurement expectations and business resilience.

- **Customers and stakeholders expect more**

  Buyers, partners and funders want evidence of environmental responsibility, pushing labs to rethink how research, testing and production are carried out.

- **Demand for greener lab products is growing**

  Suppliers are under pressure to deliver sustainable equipment, consumables, packaging and facility solutions, while maintaining quality and compliance.

- **Policy, standards and frameworks are gaining influence**

  Certification schemes and sustainability standards are helping labs move from intent to implementation and shaping how organisations measure progress.





- **Labs are inherently waste-heavy environments**

  Safety, sterility and consistency often make waste reduction more complex than in lower-risk environments, as they rely on materials that generate lots of waste.



- **Single-use culture remains deeply embedded**

  Disposable plastics and other single-use consumables are still central to many laboratory workflows, an difficult to replace at scale with greener options.



- **Labs are energy-intensive by design**

  Ventilation, cold storage and specialist equipment drive high energy demand, and reducing this requires behavioural change and infrastructure investment.



- **Performance and compliance cannot be compromised**

  Sustainability changes must not compromise quality, compliance or safety. This can slow adoption and make change more difficult to implement.



- **Progress is often fragmented**

  Many initiatives are still local, rather than coordinated across the sector. This can limit scale, consistency and knowledge-sharing across the industry.



- **Cost, time and operational pressure remain barriers**

  Budgets, workloads and operational priorities can slow adoption. As a result, good intentions do not always translate into action.

...and challenges

1. **Green chemistry adoption.**
2. **Waste reduction initiatives.**
3. **Energy-efficient lab design and equipment.**
4. **Sustainable consumables and packaging.**

How sustainability is taking shape in the lab sector

5. **Movement towards carbon-neutral facilities** [page 1].
6. **Growing collaboration between labs, suppliers, and industry stakeholders to solve these issues collectively** [page 1].

1. How sustainability is taking shape in the lab sector Green chemistry is gaining momentum

Labs are increasingly exploring ways to reduce the environmental impact of chemicals and processes, including safer solvents, lower-toxicity materials and more efficient reactions. The focus is shifting towards designing sustainability into scientific practice from the start.

2. Waste reduction is moving centre stage

Waste has become one of the most visible sustainability issues in laboratories. Efforts are growing around better segregation, reuse schemes, recycling initiatives, process simplification and reducing unnecessary material use.

3. Energy efficiency is becoming a practical priority

With labs consuming far more energy than typical office environments, attention is turning to where savings can be made. This includes more efficient equipment, better cold storage management, HVAC optimisation and behavioural changes such as switching off equipment when not in use.

4. Sustainable consumables are under the spotlight

There is increasing interest in alternatives to conventional single-use lab products, including recycled, recyclable and bio-based consumables. Packaging is also under review, with suppliers and users looking for ways to reduce excess material and improve circularity.

The sustainable lab is becoming a design challenge

Sustainability is influencing not just what happens in labs, but how labs are built and managed. Energy-efficient design, smarter infrastructure and lower-carbon facilities are becoming more important as organisations look at the full lifecycle impact of lab spaces.

5. Carbon reduction is becoming more strategic

Many organisations are moving beyond isolated green initiatives towards broader carbon-reduction goals. This includes linking lab sustainability to wider business strategies such as net-zero commitments, environmental reporting and long-term operational planning.

Collaboration is becoming essential

No single organisation can solve the sustainability challenge alone. Collaboration between labs, suppliers, institutions, certification bodies and industry groups is becoming increasingly important in developing practical, scalable solutions.

6. Sustainability is shifting from niche to mainstream

What was once led by small groups of internal champions is increasingly becoming a core topic for the wider sector. Sustainability is now more likely to be discussed in terms of strategy, procurement, innovation and competitive differentiation than as a side initiative.



Competitive landscape

Supplier focus is shifting to provide sustainable alternatives to products, services and consumables, with a turn to things like biobased materials or natural refrigerants.

Companies are taking holistic approaches; focusing on greener infrastructure, packaging and waste-reduction processes.

Labs and manufacturers alike are increasingly looking to use green frameworks to set themselves apart from competitors, whether that's LEAF, Ecovadis, ACT, or sustainable accreditation like ISO 14001.

Collaboration between suppliers and labs is becoming more important in shaping practical solutions.

Case study

How did AstraZeneca make 129 labs greener? A case study in collaborative sustainability with My Green Lab

AstraZeneca's Lab Award-winning work with My Green Lab shows how collaboration can help turn lab sustainability from an aspiration into a structured, global programme.

Challenges

Operating across a large international laboratory footprint, AstraZeneca faced a challenge common across the sector: how to reduce the environmental impact of highly resource-intensive lab environments without compromising scientific quality, safety or operational performance. Laboratories are known to consume significantly more energy than standard office spaces, while also generating substantial waste and using high volumes of water and consumables. For AstraZeneca, the challenge was therefore not only technical, but cultural — embedding more sustainable behaviours consistently across thousands of colleagues, sites and lab spaces worldwide.



Collaborative approach for change

To address this, AstraZeneca partnered with My Green Lab to create a more standardised and measurable approach to sustainable laboratory practice. Rather than treating sustainability as a local or one-off initiative, the collaboration helped establish a common framework that could be applied across the organisation's global lab network. My Green Lab certification became both a practical tool and a benchmark, helping AstraZeneca assess current practices, engage teams, identify areas for improvement and track progress over time. This collaborative approach combined external expertise and certification with internal ownership, allowing sustainability to be integrated into everyday lab operations rather than managed separately.

The solution brought together behavioural change, operational improvement and formal certification. Through its Green Labs programme, AstraZeneca engaged more than 4,500 lab and operational colleagues globally in initiatives focused on energy reduction, waste minimisation and resource efficiency. These included participation in the International Freezer Challenge, the Switch-off Optimization Program (SWOOP), HVAC optimisation, harmonised testing methods, improved waste disposal and recycling practices, solvent reduction, and the increased use of digital tools in place of more resource-intensive processes. Certification through My Green Lab also helped reinforce momentum by giving teams a clear framework for continuous improvement and a recognised standard to work towards.

The results demonstrate both scale and impact. In December 2024, AstraZeneca became the first company to achieve My Green Lab 2.0 Certification. To date, it has certified more than 129 lab spaces across 19 countries, with 91 reaching the highest "Green" level. Its SWOOP programme alone cut energy use by an estimated 7,962 kWh per day in 2024, while labs in Sweden and Indonesia saved more than 600 MWh annually through HVAC optimisation. In Brazil and Puerto Rico, harmonised testing methods reduced water use by 11,000 kL, and waste initiatives globally avoided 300 tonnes of waste. AstraZeneca's sustained performance in the Freezer Challenge further underlines the depth of the programme, with the company receiving recognition for five consecutive years.



Learnings and impact

The case highlights several important lessons for the wider lab sector. First, meaningful sustainability progress depends on combining technical improvements with behavioural change. Second, external frameworks such as My Green Lab can play a valuable role in aligning global teams and turning ambition into measurable action. Third, collaboration is critical: change at this scale requires partnership between internal teams, external organisations and site-level champions. AstraZeneca's experience suggests that when sustainability is embedded into culture, operations and continuous improvement, it can deliver measurable environmental benefits while also setting a new benchmark for the industry.

Opportunities



- **STRONG OPPORTUNITY FOR SUPPLIERS OFFERING PRACTICAL, SCALABLE SUSTAINABILITY SOLUTIONS.**
- **SPACE FOR PARTNERSHIPS ACROSS LABS, SUPPLIERS, AND INDUSTRY BODIES.**
- **OPPORTUNITY TO SHARE BEST PRACTICE AND ACCELERATE ADOPTION THROUGH FACE-TO-FACE COLLABORATION [PAGE 1]**
- **GROWING RELEVANCE FOR EVENT CONTENT, NETWORKING, AND COMMUNITY-BUILDING AROUND SUSTAINABLE LAB PRACTICE.**



Conclusion





Sustainability is becoming a defining theme for the future of laboratories. It is reshaping how labs are designed, supplied and run, and creating an opportunity to align scientific progress with environmental responsibility.

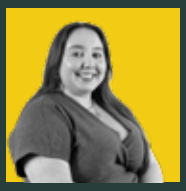
Meaningful change will depend on collaboration across the industry: between laboratories, suppliers, researchers, institutions and wider stakeholders. By sharing knowledge, setting clearer standards and developing practical solutions together, the sector can turn individual initiatives into lasting, scalable impact.

Greener labs are no longer an idealistic environmental ambition. They are increasingly linked to operational efficiency, responsible practice and long-term resilience, being built into commercial objectives. The opportunity now is to colLABorate for a sustainable future, and make sustainability part of how the lab sector moves forward.

Collaborate for a greener future

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