Environmental sustainability

5 key considerations

to help make your lab more sustainable

thermo scientific

Sustainability challenges in the lab

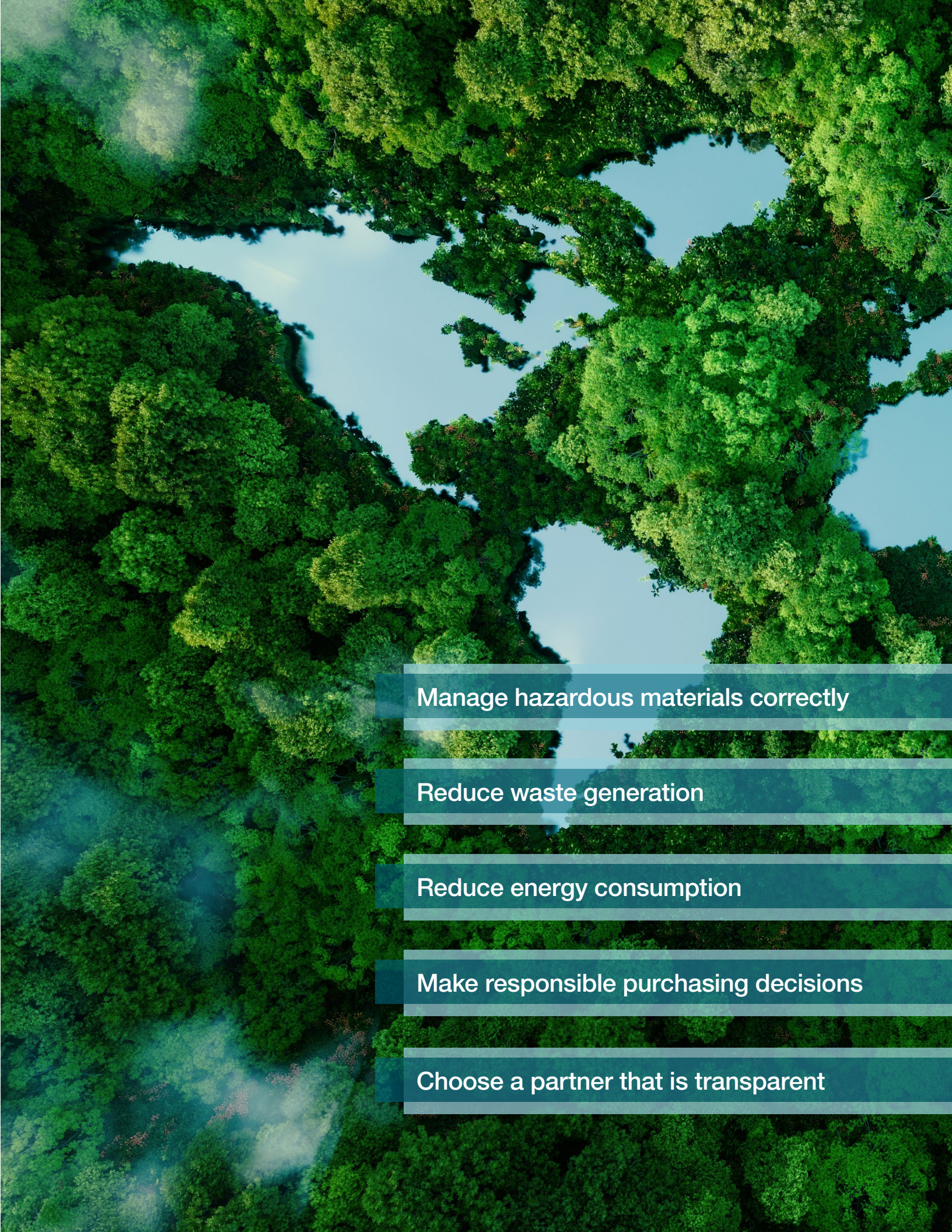
Laboratories make performing critical scientific testing and research possible. However, in doing so they account for a disproportionate amount of energy consumption and waste when compared to other commercial buildings.

The volume of waste that labs generate from the use of chemicals, reagents, and lab consumables can have a significant impact on the planet. Furthermore, labs require a sizeable amount of energy to power the facilities that are necessary to support important scientific work. According to My Green Lab, after data centers, labs are widely recognized as consuming more energy per square foot than any other sector.[1]

While many scientists express concern that implementing environmentally sustainable processes in the lab may compromise the integrity of the science, the environmental impact of unsustainable lab practices continues to contribute to climate change.

In this document, we uncover 5 key considerations to help make your lab more sustainable.

1 mygreenlab.org/blog-beaker/top-9-actions-to-take-in-the-lab-to-improve-energy-efficiency#:~:text=Did%20you%20know%20that%20laboratories,of%20energy%20your%20lab%20uses


Manage hazardous materials correctly
Reduce waste generation
Reduce energy consumption
Make responsible purchasing decisions
Choose a partner that is transparent

1 Manage hazardous materials correctly

Effective management of certain hazardous materials in labs is of utmost importance to help mitigate the adverse impact on the climate. Proper handling, storage, and disposal of hazardous materials help prevent the release of greenhouse gases (GHGs) and ozone-depleting substances into the atmosphere, which helps reduce air pollution, preserve water quality, and conserve natural resources.

By prioritizing green chemistry principles, implementing waste reduction strategies, and promoting recycling and reuse, labs can help minimize their environmental footprint and contribute to climate control efforts.

Tips to help make your lab greener

1. **Establish proper storage practices**—store hazardous materials in designated areas with appropriate labeling, segregation, and containment to help prevent leaks, spills, or cross-contamination.
2. **Implement waste reduction strategies**—minimize the generation of hazardous waste by optimizing experimental procedures, reducing excess chemical usage, and recycling/reusing materials whenever possible.
3. **Prioritize green chemistry principles**—embrace the principles of green chemistry by selecting less hazardous and environmentally friendly alternatives. Use greener solvents, reduce or eliminate the use of toxic substances, and promote more sustainable synthesis and manufacturing processes.
4. **Stay informed about regulations**—stay updated on local, regional, and national regulations regarding hazardous waste management. Ensure compliance with waste disposal regulations and seek guidance for relevant authorities to ensure proper handling and disposal of hazardous materials.

Did you know

99% of our cold storage lab equipment manufactured in the US and EU has been converted to low Global Warming Potential (GWP) hydrocarbon refrigerants and insulation.

We also implemented water-blown and greener insulation with 0 GWP and Ozone Depleting Potential (ODP).

This is just one example of how we're committed to achieving a more sustainable world—designing from the bottom up to help reduce the use and emissions of the world's greenhouse gases.

To learn more, download the latest interactive brochure, **5 reasons to consider using greener cold storage lab equipment**.

2–3%
The total amount of healthcare sector waste generated worldwide has a steady increase of 2–3% each year[1]

15%
of the healthcare sector waste is considered hazardous[2]

4.4%
The healthcare sector's global carbon footprint accounts for 4.4% of the world's GHG emissions[1]

1 ncbi.nlm.nih.gov/pmc/articles/PMC9408452/

2 who.int/news-room/fact-sheets/detail/health-care-waste

2 Reduce waste generation

The scientific community was founded on the take-make-dispose model, but that needs to change. When it comes to reducing waste and conserving resources in the lab, every small change that is made contributes to solving a bigger problem. Worldwide, it is estimated that institutions involved in biological, medical, or agricultural research produce about 5.5 million tons of lab plastic waste per year—equating to around 2% of global plastic waste.[1]

Adopting green chemistry and greener products wherever possible can make a big impact. By consciously choosing to reduce, recycle, and reuse materials and lab consumables, labs can minimize waste and conserve precious natural resources.

Tips to help make your lab greener

1. **Conduct a waste audit**—begin by assessing the types and quantities of waste generated in the laboratory. This will help identify areas where waste reduction efforts can be focused.
2. **Implement a waste management plan**—develop a comprehensive waste management plan that includes strategies for waste reduction, reuse, recycling, and proper disposal. Also check if your lab equipment supplier offers end-of-life recycling or disposal programs.
3. **Reuse and repurpose materials**—encourage laboratory staff to find opportunities to reuse or repurpose materials instead of disposing of them.

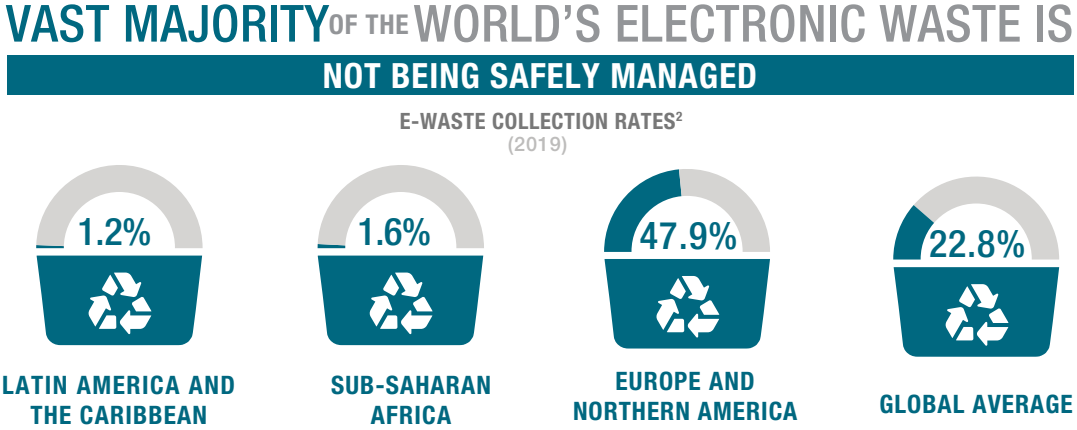
Did you know

Thermo Fisher Scientific has set a new waste target that will support our net-zero journey and aim to have 30 zero-waste certified manufacturing and warehouse sites by 2025.

By the end of 2022, 14 sites across Thermo Fisher were certified zero waste,* and we achieved a 50% non-hazardous waste diversion rate away from high-emission disposal methods in 2022.

Furthermore, through our corporate e-waste disposal program, 7,800 electrical assets were refurbished for reuse and 10,000 assets were recycled, avoiding over 3,500 metric tons of carbon dioxide equivalent ($MTCO_2e$) in raw materials and new production.

* Zero waste is defined as less than 10% of waste disposal to landfill, incineration, or waste-to-energy facilities, excluding regulated wastes.



1 https://www.nature.com/articles/528479c

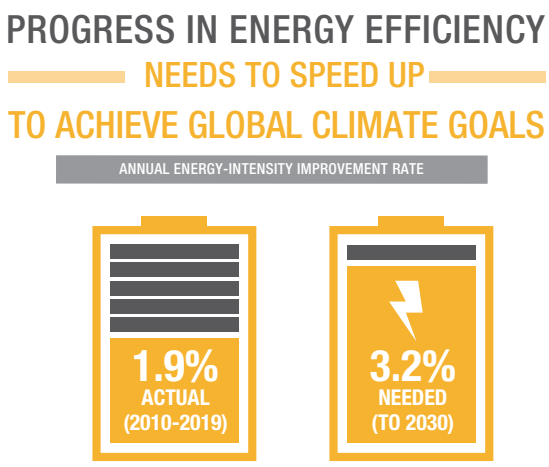
2 https://www.un.org/sustainabledevelopment/wp-content/uploads/2022/07/Goal-12-infographic.pdf

3 Reduce energy consumption

Whether it is cold storage, heating, ventilation, computers, or technology, lab equipment consumes large amounts of energy—incurring significant financial costs to organizations every year and leaving behind a heavy carbon footprint. However, there are practical ways to operate lab equipment more efficiently. By opting for energy-efficient products and processes, labs can significantly reduce energy usage without compromising the performance of equipment or the integrity of work.

Tips to help make your lab greener

1. **Equipment upgrades**—replace outdated and energy-inefficient equipment with newer models that have higher energy efficiency ratings. Look for lab equipment that has earned ENERGY STAR™ certification or similar energy efficiency labels.
2. **Equipment settings**—implement power management strategies, such as utilizing timers, occupancy sensors, or automated shut-off systems to turn off equipment when not in use.
3. **Data monitoring**—implement energy monitoring systems to track and analyze energy usage patterns in real time, such as the Thermo Scientific™ InSight™ Analytics.* Tracking this type of data can help identify energy-intensive processes or equipment and guide energy-saving strategies accordingly.



Did you know

Thermo Fisher offered more than 200 ENERGY STAR–certified models in 2022, with our cold storage lab equipment offering the largest amount of certified products on the market.

Furthermore, Thermo Scientific™ Biological Safety Cabinets (BSCs), designed to reduce energy consumption, use up to 68% less energy than cabinets with traditional AC motors.[1]

Similarly, Thermo Scientific™ TSX Ultra-Low Temperature (ULT) Freezers help save up to 70% energy compared to the previous generation of ULTs.[2]

Peltier thermoelectric technology helps Thermo Scientific™ refrigerated incubation equipment reduce greenhouse gas emissions while saving energy: A Thermo Scientific™ Solaris™ 4000R shaker over the prior model Thermo Scientific™ MaxQ™ 4000 shaker would save 1,715 kWh of energy over the course of one year of typical use,[3] while choosing a Thermo Scientific™ Heratherm™ refrigerated incubator over a traditional compressor model could save over 2,800 kWh of energy over the course of a year.[4] That's a combined total savings over 3 metric tons of CO_2 per year.

* Available in North America.

1 Compare data highlighted in the Green Fact Sheet (Biological Safety Cabinets)

2 Compare data highlighted in the Green Fact Sheet (Ultra-Low Temperature Freezers)

3 Compare data highlighted in the Green Fact Sheet (Incubated and Refrigerated Benchtop Shakers)

4 Compare data highlighted in the Green Fact Sheet (Refrigerated Incubators)

5 https://www.un.org/sustainabledevelopment/wp-content/uploads/2022/07/Goal-7-infographic.pdf

4 Make responsible purchasing decisions

Purchasing greener means purchasing smarter. Labs should consider a product's life cycle including everything from warranty and maintenance requirements to end-of-life disposal. Labs should also look to purchase products that have been manufactured more sustainably from renewable material or that are made with recycled content. A greener product can help reduce hazardous waste and carbon emissions throughout its lifetime as well as reduce chemical, water, plastic, and electricity wastage.

Tips to help make your lab greener

1. **Waste reduction and recycling**—Look for equipment that supports waste reduction initiatives, whether it's through packaging, transport, or materials used; and consider the availability of recycling programs or take-back initiatives offered by equipment manufacturers for proper disposal at the end of the equipment's life cycle.
2. **Extended life**—Consider choosing products with a longer warranty offer, as well as the ease of equipment maintenance and availability of spare parts. Equipment that is easy to service and repair can extend its lifespan and reduce the need for frequent replacements, thus reducing waste and resource consumption.
3. **Certification and standards**—Look for lab equipment that meets or exceeds recognized environmental standards or certifications specific to the industry or region.

Did you know

Thermo Scientific™ laboratory equipment is designed and manufactured with environmental sustainability in mind. By using green refrigerants, designing for energy efficiency, and building our products with recyclable materials whenever possible, we seek to protect the environment and help others do the same. Many of our products are ENERGY STAR–certified, and carry the ACT™ label to provide clear, third party–verified information about the environmental impact of our equipment.

We are committed to achieve net-zero emissions by 2050, and are continuously investing in minimizing the environmental impact of our products and packaging—designing from the bottom up to help protect the planet.

To explore our lab equipment portfolio, download the latest **interactive brochure**.

5 Choose a partner that is transparent

The ACT label: A guide for making greener product choices

When you're looking for sustainable products, we believe it should be easy to make informed purchasing decisions. In addition to Thermo Fisher's greener products self-label program, which provides transparency through documentation of green claims, we participate in the ACT label program. Created by the non-profit organization My Green Lab to help consumers make smart, sustainable product choices, the virtual ACT label provides environmental Accountability, Consistency, and Transparency for each labeled product through an environmental impact score. The score is based on the product's environmental impact with regard to manufacturing practices, energy and water use, and end-of-life disposal. It's like an eco-nutrition label for lab products.

ACT. The Environmental Impact Factor Label

Our Company

Thermo Fisher Scientific, Inc. is the world leader in serving science. Our Mission is to enable our customers to make the world healthier, cleaner and safer. Whether our customers are accelerating life sciences research, solving complex analytical challenges, increasing productivity in their laboratories, improving patient health through diagnostics, or developing and manufacturing life-changing therapies, we are here to support them. Our global team delivers an unrivaled combination of innovative technologies, purchasing convenience and pharmaceutical services.

Corporate Social Responsibility

Building a brighter future

As the world leader in serving science, we understand that we have a unique opportunity and responsibility to use our position to make a positive impact on society—not only by enabling our customers' success, but also through our actions as a Company to make the world a better place.

Our CSR approach is focused on four key pillars—Operations, Colleagues, Communities and Environment. This strategic framework allows us to effectively manage the environmental, social and governance (ESG) priorities that are fundamental to our business, driving competitive differentiation, and creating sustainable value for all our stakeholders.

Our Corporate Social Responsibility reports are available to provide further detail to our CSR programs and the progress we make each year.

Read the 2022 CSR report

Learn more at **thermofisher.com/labequipment**