

Toward Zero Waste

A guide to creating a zero-waste facility

ThermoFisher
SCIENTIFIC



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We're on this Earth for 80 years, but the garbage we generate will be here for 400 years or more. At Thermo Fisher Scientific, we don't want our waste to be a part of our legacy.

Cristina Amorim

Vice President, EHS & Sustainability
Life Sciences Solutions

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About This Guide

Zero waste is increasingly prominent on the sustainability agenda of leading corporations. From Unilever and DuPont to Ford Motor Company and Walmart, forward-looking global brands are adopting zero-waste targets for their operations and facilities.¹

This guide is a starting point for organizations looking to follow suit and explore zero-waste strategies. It provides a high-level, step-by-step guide to practical, effective, universal actions that site-based organizations can take, regardless of sector. Toward Zero Waste builds on best practices and lessons learned during our own journey down this road at Thermo Fisher Scientific.

Our goal is to help you use zero waste—as we have—to promote innovation, environmental improvement, employee pride, and customer satisfaction.

About Thermo Fisher Scientific

Thermo Fisher enables its customers to make the world healthier, cleaner, and safer. We design and manufacture specialized scientific and clinical products and services including analytical instruments, lab equipment, diagnostics, and reagents. These help customers accelerate life sciences research, solve complex analytical challenges, improve patient diagnostics, and increase laboratory productivity.

Thermo Fisher has operations in 50 countries and a 75,000-strong workforce. As of 2019, we have 24 sites working toward zero waste, 14 of which are third-party certified zero waste facilities. Six of the certified sites are in the United States, two in the UK, two in Germany, two in Singapore, and one each in Israel and the Netherlands. (See the [back page](#) for the current list of certified locations.)

Why Zero Waste Matters

Thermo Fisher's certified zero-waste sites saved about \$6.7 Million collectively between 2012 and 2019.



How Waste Costs Businesses and Society

Waste management is not yet featured on many boardroom agendas. Instead, discussion usually takes place at lower levels in an organization, and focuses on what to do with the contents of a dumpster—the best options being to reuse or recycle them. But a strategic view of waste starts much earlier—with how to avoid it at the source. Making better use of resources in this way makes sound business sense, bringing efficiency as well as cost and reputational benefits.

Forward-looking companies recognize this reality. Embracing zero-waste strategies is one way they are working to reduce the impact of the design, manufacture, transportation, customer use, and disposal of their products.

A Wasteful World: In Numbers



44%



38%



18%



4.4 pounds

258 million tons

Paper, plastic, metal, and glass generated by businesses and households make up 36% of global garbage. Organic waste, mostly food, is the biggest culprit at 46%. Miscellaneous waste like ceramics, paints and glues, and batteries make up the remaining 18%.²

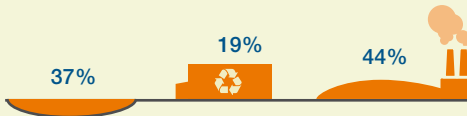
Each American generates 4.4 pounds of garbage a day, collectively 258 million tons.²



Humans generate enough waste each year to fill 52 million New York City garbage trucks.³



5%



37% of waste produced worldwide is buried in landfills while only 19% is recycled or composted. The remainder is incinerated or ends up in open dumps, depending on the country.²

Municipal (commercial and residential) solid waste alone accounts for almost 5% of global greenhouse gas emissions.²

Cost to Society

Modern society is literally costing the Earth. To satisfy our need for food, shelter, medicine, technology, and consumer goods, we are using up natural resources faster than they can be replenished. Rising standards of living and a throwaway approach to products and packaging accelerate this process. Waste disposal also generates potent greenhouse gases (GHGs), including methane, that fuel climate change and expand companies' carbon footprint.

Cost to Businesses

Waste management is increasingly costly for businesses, in terms of outgoings, regulatory compliance, and reputation.

From 2009–2015, waste removal costs worldwide rose 66% faster than electricity costs.⁴

Regulatory pressure is also growing. Los Angeles, New York, and San Francisco have set zero-waste-to-landfill requirements for businesses.⁵ Nearly 400 European cities are following a zero-waste roadmap.⁶ Brazil, Canada, Japan, Mexico, South Africa, and 33 U.S. states are among countries and regions adopting producer responsibility policies.⁷

Such regulations put pressure on companies to reduce packaging waste, provide takeback programs, and phase out unrecyclable packaging such as Styrofoam. There is also a potential reputational cost for businesses that supply goods in packaging bound for landfill. In our experience, when garbage branded with corporate logos sits in customer offices, warehouses, or laboratories, it conveys a negative image.

Less Waste, More Opportunity

“Our ability to attract top, conscientious talent is enhanced when we’re clear on our mission of sustainability and can highlight our efforts and achievements.”

Millennial Employee Resource Group, Thermo Fisher

Given these risks for companies, zero-waste strategies are increasingly moving from the margins to the mainstream. From Mars, Inc., Nestlé, and Unilever to DuPont and Ford Motor Company, global companies are reaping economic benefits through operational savings and innovative partnerships.¹ Waste also becomes a positive area of conversation, collaboration, and negotiation with customers and suppliers, providing an edge over competitors.

Opportunity for Business

Systemically reducing waste can generate significant cost savings by cutting raw material inputs, energy use, and fees for waste haulage and landfill disposal (see examples throughout this guide). By recycling materials with market value, companies can also generate revenue.

Importantly in today's competitive marketplace, adopting zero-waste goals can also boost brand value as well as employee engagement and pride (see Employee Ownership Drives Success, [page 14](#).)

Customers, too, are increasingly sustainability-minded. Our manufacturing site in Inchinnan, Scotland was adopted as a preferred supplier by a key customer after achieving zero waste in 2014. Another site won a high-profile contract over a rival company by supplying lab vials packed in recyclable cardboard rather than expanded polystyrene (EPS) foam.

Opportunity for Society

Society also gains from business leadership on zero waste. Environmental benefits include conserving natural resources and reducing waste-related GHG emissions. Economic benefits include the new jobs created in recycling sectors when major companies implement zero-waste initiatives. The labor-intensive global reuse and recycling industry creates four to ten jobs for each job created in the landfill sector.² In the United States, 86% of waste management jobs now focus on recycling and only 14% on landfill and incineration.³

Zero Waste Defined

Thermo Fisher uses a
three-level approach to
certify zero-waste sites.



What Is Zero Waste?

There is no single, universally accepted definition of zero waste. In general, certification agencies define the term as the diversion from landfill of at least 90% of a site's waste materials. Acceptable disposal alternatives to landfill include reuse, recycling, and (as a last resort) incineration when used to generate energy.

At Thermo Fisher, we aim for no more than 10% incineration, compliant with host government guidelines, unless additional incineration is superior to other diversion tactics. Our Norway and Japan facilities, for example, have difficulty limiting incineration to 10% because the country's infrastructure supports waste-for-energy incineration on a large scale.

We follow the zero-waste rating program in the table below for our facilities. The three levels are based on the landfill diversion validation criteria set out in the [Underwriters Laboratories \(UL\) certification agency's Standard Environmental Claim Validation Procedure \(ECVP\) 2799](#).

Thermo Fisher sites include manufacturing, distribution, R&D, and office facilities.

Thermo Fisher's Three Levels of Zero Waste

BRONZE



**≥90% Diversion
from Landfill**

.....
UL Certification Equivalent:
"Landfill Diversion Rate"

SILVER



**98% Diversion
from Landfill**

.....
UL Certification Equivalent:
"Virtually Zero Waste to
Landfill Facility"

GOLD



**100% Diversion
from Landfill**

.....
UL Certification Equivalent:
"Zero Waste to
Landfill Facility"



Five Steps to Zero Waste

At Thermo Fisher, we take a 'trash into treasure' approach to every waste stream—looking for hidden value by first minimizing waste and then recycling or upcycling the remainder.

Our Road Map

Our goal is to close the business production loop, drive productivity through efficiency, and help future-proof our business as more municipalities issue zero-waste regulations. To make this happen, we need to focus on 'removal chain' efficiency the same way we focus on supply chain efficiency.

The impetus for this approach began with our EHS, Sustainability, and Practical Process Improvement (PPI) functions. Facility leaders provided strong support, enabling swift progress to 14 zero-waste sites in just four years. Site managers also worked closely with employees, suppliers, waste haulers, and other partners to reach 90% diversion rates.

After the first zero-waste certification, our operations leadership raised the issue's profile by challenging manufacturing sites worldwide to follow suit.

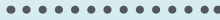
The five-step road map below draws on our experience regarding the teams, processes, partnerships, and investments required when embarking on a zero-waste program.



> STEP 1 <



Get People in Place



Becoming a zero-waste facility takes leadership, day-to-day operational management, and (most importantly) robust employee engagement.

Effective programs involve employees across a company—from offices to manufacturing, packaging, and distribution centers. Zero-waste teams need knowledge of the materials used in all products and packaging. They must also know and understand every waste stream—from the R&D lab, to manufacturing and distribution facilities, offices, the cafeteria, and landscaping.

Everyone Owns Their Trash

Every employee at every level of the organization must play his or her part by segregating their trash. A key lesson learned across Thermo Fisher sites is that changing the daily habits of hundreds or thousands of people requires visibility, intervention, and intensive engagement.

Many of our zero-waste facilities turned the corner on recycling by replacing waste bins under people's desks with centralized sorting locations in each floor or work area. These stations provide clear instructions on what types of waste to reuse, recycle, compost, or landfill. While employees often complain about losing deskside bins, they usually come around once they see how a common sorting area is key to achieving zero waste. (see [page 30](#)).

As an added bonus, in our experience removing deskside waste bins also reduces time spent by cleaners removing waste by over 80%.

Corporate-Level Key Players

High-Level Sponsor

Executives or operations unit heads who see the strategic value to the business of a zero-waste strategy. They are leaders, inspiring changes in culture and process across the organization.

Zero-Waste Steering Committee

A team of EHS and Sustainability leaders providing company-wide oversight for the zero-waste program. This committee defines the company's zero-waste targets and the details of the program.

Key responsibilities include setting requirements for acceptable incineration levels and deciding whether sites must be third-party certified to claim zero-waste status.

Site-Level Key Players

Zero-Waste Champion

Usually the site leader or plant manager. His or her engagement is critical to changing employee culture, aligning zero-waste activities across the site, and communicating changes (along with the zero-waste leader) to ensure buy-in for the program. Thermo Fisher's manufacturing site leaders challenged each other to achieve zero waste first, resulting in a healthy ongoing competition for certification between facilities.

Zero-Waste Leader

Provides direction and program oversight and generates employee interest. At Thermo Fisher sites, this is generally an EHS, Facilities, or Process Excellence team leader looking to execute leaner operations and drive sustainability savings. He/she also leads the site's zero-waste team.

Zero-Waste Team

Frontline troops who devise and execute the program. Participants should include EHS, Process Excellence, and Facilities team members as well as representatives from each department or unit that generates waste streams. These teams participate in dumpster dives, arrange department competitions, and oversee zero-waste training and auditing.

Steering Committee

Department heads who need to buy in to and align with the program. At smaller facilities the site leadership team can play this role.



ZERO WASTE IN ACTION

Employee Ownership Drives Success

Most of our zero-waste sites have at least doubled their landfill diversion rates in three years; some have done so in just a year. This rapid progress has often been propelled by engaging and empowering employees in creative ways. We have had success with:

Friendly Competition: Several U.S. facilities engaged in a yearlong 'Race to Zero Waste' initiative in 2012. Others held competitions between site buildings.

Zero-Waste Training: Eliminating confusion about how to sort waste often goes a long way toward improving recycling rates. Eliminating



confusion about how to sort waste often goes a long way toward improving recycling rates. Training to provide clarity on which items go in which bin can help. The U.S. distribution center in Frederick, Maryland trained all employees, cleaning crews, and the site green team through classroom lectures, on-the-spot reinforcement, and signage providing clear guidance on waste disposal. Waste container audits measured the training's effectiveness.

Earth Day Launches: Manufacturing sites in Singapore and Inchinnan, Scotland launched zero-waste drives on Earth Day, when sustainability is on everyone's radar. In just 15 months, Inchinnan's recycling rate soared from 52.3% to 87%, halving waste disposal costs.

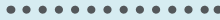
Employee Creativity: Encouraging employees to come up with outside-the-box waste-saving ideas reaps rewards. At Inchinnan, a green team member suggested a "green office recycling day." This led to a site-wide swap of office supplies, which saved procurement costs.

Frequent Updates: To keep momentum going, the Frederick site held monthly feedback meetings and progress updates, and incentivized participation by regularly providing rewards (see also [Step 5](#)).

> STEP 2 <



Know Your Waste



Once you have a site team in place, walk together throughout the facility recording every waste stream, from cafeteria to production line. The map below shows common waste materials at each step.

This process will help the zero-waste team better understand where dumpster contents originate, and identify major waste sources for landfill diversion. These materials can result in a big win, and should be evaluated first for waste prevention, reuse, or recycling opportunities.

Paper	Writing instruments
Electronics	Other office supplies
Toner cartridges	Bottles
Light bulbs	Cans
Food waste	

Food waste	Paper bowls
Bottles	Paper cups
Cans	Plastic utensils
Napkins	Tea bags
Paper plates	Coffee grounds
Paper boxes	Cardboard



Waste Anatomy of a Manufacturing Site



Biggest Cost Savings

After following a process like this, companies that took part in the U.S. Environmental Protection Agency's **WasteWise** program identified the biggest cost savings in the following areas:

Receiving Goods

By requesting that suppliers ship raw materials with less packaging

Office Operations

By printing and using less paper

Manufacturing

By changing product design to use fewer materials and refining manufacturing processes to reduce waste

Paperless Innovation

Traditionally, Thermo Fisher reagents were shipped with costly, time-consuming paper instructions that were quickly outdated, requiring disposal. In 2014, we started printing instructions directly on the inside of product packaging and pointing customers to a web page for updates. While paper can be recycled, opting not to produce product manuals for select products saved thousands of dollars and hundreds of labor hours a year. The paperless effort is continuing company- and product-wide, as it not only saves operational costs but also makes things easier for our customers.

Go Dumpster Diving

It may sound unsavory, but dumpster diving—conducting a detailed audit of the contents of a typical site dumpster—is a useful additional step to capture every possible waste stream. In our experience, this detective work can uncover recyclables wrongly disposed of as trash and items that currently don't have an option for recycling and need attention. It's also an opportunity to engage employees (and sometimes local media) in your zero-waste kickoff activities.

Also consider using dumpster dives as an annual audit mechanism, providing a snapshot of progress toward your site's zero-waste goals. See [page 33](#) for more in-depth tips and lessons.

ZERO WASTE IN ACTION

Making a Business of Reuse and Resale

Knowing your waste will enable you to unearth hidden value from all kinds of used materials, driving productivity through greater efficiency.

Our 330,000-square-foot facility in Asheville is a model example. The manufacturing site houses 550 employees and makes laboratory products including freezers, furnaces, and cryopreservation equipment. In 2010, the site generated 37 tons of landfill trash per month. Achieving zero waste (May 2014) has brought \$550,000 per year in savings, shown below.

Reduce	Annual Cost and Waste Savings
Paper towels replaced by air dryers in washrooms; paper use and cleaning labor reduced.	\$30,000 and 6 tons
Low-efficiency “spray to waste” spray guns used to paint parts replaced with a new automated system that gets more paint on the part the first time and captures the rest for reuse. Efficiency grew from 40% to 98%.	\$400,000 and 36 tons of paint
Foam test shot reduction: fewer tests conducted for refrigerator insulation without impacting product quality or process safety.	\$50,000 and 6 tons

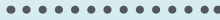
See [Step 4](#) for more details.

Reuse	Annual Cost and Waste Savings
Wood pallets used for transporting materials and products are collected, reworked, and resold to a site supplier.	\$30,000 (revenue from resales)
Food waste from the site cafeteria is collected by a waste hauler to be turned into compost.	20 tons
Packaging, including plastic and paper bags, foam sheets, and bubble wrap, is reused internally—for shipping items to suppliers—and for product sales, in place of new packaging material.	\$40,000 (savings on packaging)

› STEP 3 ‹



Separate and Measure



This next step will likely require shaking up your site's waste management practices. All relevant personnel must be brought on board, especially those responsible for site operations, cleaning services, and liaisons with waste contractors.

Tips for Success

- **Work with department managers on how to adapt processes** such as recyclables collection in ways that minimize costs, time, and disruption. For example, our zero-waste manufacturing sites place recycling containers near scientists' workstations to collect plasticware generated in labs. That way, recycling does not impact employee time and productivity.
- **Consolidate collection areas for the waste streams identified in Step 2.** This makes it easy for people to do the right thing—segregate waste instead of throwing it all in the landfill trashcan. Common categories in the collection area include: paper/cardboard, electronics, and glass for recycling; toner/ink cartridges for takeback; and organic waste for composting. Store items intended for reuse, such as plastic storage bins, wooden pallets, used furniture, or lab equipment, in a staging station to facilitate its second life.

- **Get custodial personnel involved.** Their participation can make or break a zero-waste program. To assist non-native speakers, label recycling and trash containers in relevant languages to provide clear guidance on separation and sorting. Provide initial zero-waste training and regular refresher training in native language(s) including assistance with problem-solving issues that arise.

For example, you may have three waste streams for pickup but the existing cleaning carts have only two waste containers. Zero-waste team members can shadow cleaning crews to understand their process and assist with proper sorting. Reward and thank custodial personnel who identify solutions, and ask them to alert the zero-waste team if employees need waste sorting reminders.

- **Investigate your current waste haulers' recycling and diversion services** and negotiate for your needs. The waste hauler for our Pleasanton, California site agreed to accept recyclable plastics and dry chemical glass bottles and to collect cardboard for free. If your current hauler is inflexible, look for a new partner.
- **Regularly weigh and record the waste your site generates** in total and in each category to establish a baseline and then measure progress. Work with your waste hauler to access data for your site. Our Pleasanton site weighed each bag of segregated waste to measure landfill diversion progress by utilizing an existing scale in distribution. Each waste stream was weighed once per week for one month. At another site, the recycler provides this service.
- **Audit your waste collection areas regularly** to make sure the program is working, and help educate employees. Pleasanton's zero-waste team photographed incorrectly segregated waste and posted the "Violation of the Week" photos above the bins.



ZERO WASTE IN ACTION

Partnering with Suppliers and Customers

Achieving zero waste requires collaboration with others along the value chain—suppliers, waste haulers, and even customers. Suppliers, in particular, have a strong stake in keeping your business and will often negotiate on takeback and recycling.



Our Singapore manufacturing and office facilities, for example, worked with partners to solve the challenge of keeping unrecyclable expanded polystyrene (EPS) foam packaging out of landfill.

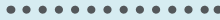
Site managers approached suppliers about our zero-waste effort and moved forward with those who agreed to free pickup services. For example, local instrument part suppliers agreed to take back and reuse EPS foam and cardboard boxes free of charge. Several local Thermo Fisher customers also bring back EPS coolers for reuse.

Negotiation with the electronic waste vendor for the two sites led to an agreement where Thermo Fisher pays transport costs only and the vendor makes a profit overall from the recycled electronic equipment. To support accurate tracking of our sites' waste volumes, the vendor also agreed to send us the e-waste data.

> STEP 4 <



Find the Right Home



Your waste is categorized and separated. Now the hunt begins for a new home other than landfill for each material. Keeping an open mind is key to reaching 90–100% diversion. Question old practices and apply smart and lean process management tools as you rethink your operations from a zero-waste perspective.

Eliminate

The ideal way to reduce waste is to avoid creating it in the first place. Tried and tested approaches include:

- Right-size—convert to optimum size—your purchases of raw materials to save on costs, excess material, and packaging waste. At one end of the scale, this involves purchasing in bulk; at the other, it means buying smaller quantities of materials or products that expire before being used in manufacturing or production processes. For example, our manufacturing and distribution site in Carlsbad, California switched to buying the solvent guanidine in six large bags, stored in reusable drums, rather than in 72 bottles, saving tens of thousands of dollars a year. The site also downsized ferric nitrate purchases to avoid scrapping expired raw materials. Together with other measures, Carlsbad reached 80% landfill diversion (see [Recycling Challenges](#) for more information on Carlsbad).

Elimination in Action

- **Smarter production processes:** Solvents for our manufacturing operations were traditionally supplied in 4-liter or 56-liter containers, requiring frequent replacement. Several sites designed new solvent delivery systems, using 200-liter reusable containers that minimize waste. At Pleasanton, California and Regensburg, Germany, reusable containers deliver very significant annual cost savings.
 - **Right-size purchasing:** Our Bedford, Massachusetts facility took a different approach, installing two 2,000-gallon tanks to accept bulk delivery of a particular solvent. This saves a great deal of procurement spend each year and eliminates dozens of small drums from the site's waste stream. Similarly, by bulk-purchasing another raw material, our Israel site saves \$27,000 a year, and by buying preservation media in larger containers, our Frederick, Maryland site saves \$88,000.
 - **Avoidance:** Landscaping also offers zero-waste opportunities. By leaving cut grass clippings on site grounds to decompose naturally, facilities keep biodegradable waste out of landfill. At our Frederick, Maryland site, this avoids more than 12,000 pounds a month of organic waste.
-



TOWARD ZERO WASTE

- Buy items with lighter or less packaging and ask suppliers for recyclable or reusable packaging. In Carlsbad we reduced the height of dangerous goods containers, fitting more of these boxes on each pallet, which improved shipping efficiency and dimensional weight. This simple change saved money by reducing packaging volume by 1.5 tons and cutting associated freight costs.
- Switch from single-use to reusable items, such as rechargeable batteries, cafeteria dishware and cutlery, and water stations instead of bottles. Make expectations clear about company-owned reusable items to ensure they are not removed.
- Optimize manufacturing processes so products require fewer input materials and generate less waste. Our Asheville manufacturing site found additional cost savings by updating its quality control process for the foam used to insulate refrigerators. Foam tests were reduced from a 10-second shot twice a day to a 5-second shot once a day, cutting foam waste by 6 tons a year without affecting quality procedures. Asheville pays its cardboard supplier to collect the remaining foam and use it in the gasification plant at its 100% recycled cardboard manufacturing site.

While some approaches, especially changing production line processes, can require upfront investment, they often result in lower operating expenses as well as environmental gains (see [page 27](#)).



Repurpose

Systematically reusing waste materials onsite is the next best option. It boosts your diversion rate while often cutting purchasing and waste disposal costs. Typically, some effort is involved to check, clean, repair, and/or dry materials that are reuse-friendly. Common examples at Thermo Fisher include gel packs, cardboard boxes, plastic containers, packaging pallets and crates, freezer boxes, crockery, cutlery, and office furniture.

Company-wide programs encourage a repurposing mindset and maximize environmental and cost gains.

Repurposing in Action

- Office and lab equipment is costly and often bulky to store, taking up valuable space. To avoid landfill disposal and replacement purchasing, our Asset Management Program coordinates maintenance and cross-site repurposing or sale of scientific and office equipment and supplies.
- For hard-to-recycle waste items, explore reuse services offered by specialist recyclers or suppliers. For example, [TerraCycle](#) offers a variety of recycling programs through which you may recycle nearly every type of waste.
- Find ways to reuse waste in your operations. Our Marsiling, Singapore site saves money each year by refreezing and reusing gel packs for internal company shipments between distribution centers.

Recycling

Recycling is the fallback option for waste you neither avoid nor reuse. At most Thermo Fisher zero-waste sites, recycling accounts for the bulk of our waste reduction efforts.

Reaching at least 90% diversion requires investing in a comprehensive recycling infrastructure with easy, convenient access for everyone on-site. Place recycling bins in restrooms, break rooms, and conference rooms, and distribute containers for collecting cardboard and packaging materials on every floor. For specialized waste such as lab bottles or manufacturing metal byproducts, place well-labeled containers in a high-traffic common area. See also [Step 5](#) for employee engagement ideas.

Recycling Rewards

Extensive recycling of in-demand materials like metals and cardboard can generate revenue and achieve cost savings, a win-win for site profits. For example, our Frederick facility receives thousands of dollars each year in recycling revenue—in addition to paying less for landfill. The Asheville site generates hundreds of thousands of dollars annually in recycling revenue, which helps cover transportation charges for harder-to-recycle materials.

Recycling Challenges

Today, municipalities vary widely within and between countries on rules for waste separation and recycling. As the removal chain matures as an industrial sector, we hope that countries and municipalities will work toward uniform waste management standards that support companies seeking to implement zero waste.

At present, each Thermo Fisher site separates its waste streams in different ways to satisfy the local recycling infrastructure. For example, Pleasanton can commingle most recyclables in one container, while our South San Francisco facility located just 40 miles away must separate plastic, paper, and glass. Our Carlsbad site reached 80% landfill diversion but fell short of 90% needed for zero waste because of a lack of cost-effective municipal composting infrastructure. The site is ready to adopt composting when the infrastructure comes online in the near future.



ZERO WASTE IN ACTION

Upcycling Innovation

As recycling services become more widespread, look for opportunities to upcycle major waste streams into new products. Often, the partner you need may be an existing supplier.

This was the case when our DNA manufacturing facility in Pleasanton, California began looking to recycle the 3 tons of plastic lab gloves it threw away every year. The site's zero-waste team leader approached glove supplier Kimberly-Clark with an innovative offer: become Thermo Fisher's sole glove supplier—increasing their revenue—in return for taking back Pleasanton's used nitrile gloves for upcycling into new products. Kimberly-Clark lined up [RightCycle](#) to convert the gloves into pellets and then into plastic lumber, benches, and picnic tables.

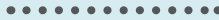
“Plastic gloves were one of the largest waste streams we found in 2011, when the site's landfill diversion rate was at 30%,” said Eve Nichelini, Pleasanton's former zero-waste team leader. “By the end of 2012, through our upcycling and other efforts, we were at 96% waste diversion.”

Fifteen more U.S. facilities have since adopted the program. In 2019, these sites diverted almost 40,000 pounds of lab gloves and single-use gowns from landfill through the Kimberly-Clark RightCycle program. Five of our top diverting sites received the RightCycle Greenovation Award this year. In all, 850 Kimberly-Clark customers now use the service.

> STEP 5 <



Create Buy-in, Measure Progress



Green Recognition

Zero waste requires a 100% team effort. Recognizing employees' contribution increases ownership and advances a positive work culture. Letters and thank-you cards from managers and executives, like the examples seen below, can highlight employee achievements. Reward cards redeemable for prizes are also popular.



- **Sustain support for zero-waste activities.** Some creative ideas from our sites include: mini bins to collect food waste and tissues on employees' desks before being emptied into compost collection containers; posters in restrooms and by elevators; employee point systems for zero-waste activities; and recycling pledge days (Earth Day being an obvious choice). Tying efforts to winning an external award or to campaign-style messaging can also be a strong motivator.
- **Encourage employee feedback.** Set up an interactive intranet page or bulletin board, and invite teams or departments to come up with ideas, such as going paperless. If your site has a green team, add zero-waste projects to its scope. At our sites, some green teams become the zero-waste team.
- **Establish a process for sharing waste diversion data.** A thermometer infographic is often a useful tool to update employees and demonstrate landfill diversion progress.
- **Assess progress at least quarterly** at zero-waste team and steering committee meetings that review metrics, feedback, and progress toward goals.
- **Share best practices and find ways to improve.** Each company and site is different and some approaches may prove too costly, time-consuming, or lacking in support to succeed. Share what works across departments, sites, or business units to avoid making mistakes your colleagues have already learned from.

Lessons Learned and Next Steps at Thermo Fisher

Not every approach we took was a success right away. Sites learned by doing, and they shared lessons with other facilities. Here are a few examples:

- When Pleasanton introduced waste sorting stations, some commonly used items were ending up in the wrong bin. The zero-waste team reminded employees where to correctly place these items using pictures and eye-catching messaging.
- Pleasanton discovered that a new team moving to the site was not on board with zero waste, so they provided in-depth training and communications to get their buy-in.
- Seeking input from and properly preparing custodial crews regarding the waste collection process, as well as acknowledging and rewarding their contributions to the waste reduction effort have made an important difference in advancing zero-waste at our sites.

Moving forward, we aim to certify as many zero-waste sites as possible, while continuing to help customers achieve zero waste through our products and services. This approach supports our company mission—to enable our customers to make the world healthier, cleaner, and safer.





ZERO WASTE IN ACTION

Conducting a Dumpster Dive: Tips and Challenges

Waste characterization studies, also known as dumpster dives, are a great way to both engage employees and measure progress. Our Eugene, Oregon facility launched its zero-waste program with a dumpster dive to establish a benchmark, and then did three more to measure progress.

The final dive revealed an impressive 96% diversion rate. Find tips and guidance from Eugene and our other zero-waste sites on pages [34](#) and [35](#).



Conducting a Dumpster Dive: Tips and Challenges

1 Get Organized

Engage your facilities managers, custodians, internal safety departments, and waste hauler(s). Secure any required permissions from an executive or landlord. Pick a warm weather date, at least three months out, and an open, accessible location such as a parking lot or loading dock.

Close to the day of the event, gather supplies including large tarps to spread the trash out on and transparent waste bags for sorting. Goggles, grabbers, and lab suits are optional but volunteers should wear gloves, closed-toe shoes, and clothes that can get dirty.

Promote the event, actively recruit employees, and provide incentives and prizes for taking part. For example, volunteers can sort a bag of waste to earn a ticket to a beer garden or win a gift certificate. Holding the dumpster dive to coincide with a popular event, such as Earth Day, helps to draw crowds.

2 Assemble the Waste

Several days' worth of trash, up to one week, is ideal. Instruct site cleaning crews to set waste aside in a designated spot. If you have a compactor, ask your waste hauler to provide a temporary extra dumpster. Put a plan in place for emptying



the dumpster onto the tarp and removing the waste after the event. Many haulers will not pick the trash back up, so your volunteer team may need to reload the dumpster.

3 Sort and Separate

Have the hauler empty the dumpster onto a strong plastic tarp. Organize volunteers into groups to separate the waste into trash and recycling streams, assigning roles including sorter, measurer, and data recorder. Using handheld luggage or floor scales, first weigh each pile to quantify the waste and estimate a baseline for your current landfill and recycling rate. Then sort the waste into material and recycling streams. Analyzing the results will help you calculate your site's optimal recycling rates and identify hard-to-recycle items. Be sure to record all data.

4 Evaluate and Communicate

Explain the findings to everyone on-site. What is the biggest waste stream not being recycled? Where does it come from? How can employees reduce the volume of recyclables in the next dumpster dive? Refresh training for employees building on lessons learned, or pursue new avenues for engagement.

Zero-Waste FAQs

What if we cannot find a local waste provider that recycles?

Waste management solutions vary by municipality, region, and country. If services are not available to meet your waste needs, consider:

- Partnering with suppliers and subcontractors in your value chain to reduce waste and identify opportunities for bulk recycling. Our Asheville site offered their recycling streams to the highest bidder.
- Seeking area businesses or suppliers that may utilize some waste streams.
- Using manufacturer mail-in programs for office and facilities supplies.
- Asking your supplier if they will take back the waste material from their products.
- Contact your city for help. Cities have waste reduction goals so they may have a person responsible for assisting companies or can refer you to resources to explore or have consultants available to help you. Ask for a free waste audit if available.

What if our site has a major waste stream that is too costly to recycle?

Faced with materials that come with high recycling costs, corporations have:

- Arranged for a current supplier to take the waste by paying transportation costs.
- Substituted non-recyclable for recyclable or reusable materials. (Frederick changed its gel ice pack to a different brand that could be qualified for reuse.)
- Revised supplier and purchasing policies to stipulate recyclable materials with higher economic value.
- Contacted their supplier for lab plastics to ask them to switch from non-recyclable to recyclable plastics
- Sought long-term contracts with waste haulers and recyclers to stabilize costs.

If zero waste is only one part of your sustainability plan, then cost savings elsewhere might help pay for recycling problematic materials.

How much energy does recycling save compared to manufacturing new products?

It depends on the material itself, but the energy and greenhouse gas (GHG) emissions savings from recycling over manufacturing can be substantial, and recycling reduces your company's carbon footprint across the supply chain.

The U.S. Environmental Protection Agency Waste Reduction Model tool can calculate energy and GHG emissions reductions based on different waste management practices.

What kinds of common waste are generally unrecyclable?

Some items used every day are not usually recyclable such as paper coffee cups, candy wrappers, chip bags, and food-soiled foam. Companies and nonprofits offer solutions for some difficult-to-recycle items. In the United States, for example, the following businesses offer mail-in programs:

- **Waste Management** for light bulbs, batteries, and medical waste
- **Call2Recycle** for battery and cell phone recycling
- **TerraCycle** for food wrappers, writing instruments, binders, breakroom waste, earplugs, disposable garments, and filters
- **Staples** for e-waste and cartridges for ink and toner

Why is incineration considered an acceptable approach for achieving zero waste when it generates greenhouse gases?

In the absence of a global standard that defines recycling, and how to handle recycling streams, incineration is commonly used by companies as one zero-waste strategy. Incinerators reduce landfill volume and can generate electricity. Some countries rely on incineration because they lack either space for landfill or alternative disposal options for waste that as yet has no recycling stream. This is the case for some of our waste streams in Israel. In the future, every material will be used, and product manufactured, with a second life in mind; for now, we accept that there are trade-offs needed.

UL's zero-waste standards accommodate limited incineration with the following conditions:

- Incineration does not generate ash defined as hazardous
- Generated ash is disposed of properly; and if it is sent to landfill, the ash must be included in the total mass discarded value
- Incineration must be compliant with government emissions regulations^a

Our Zero-Waste Sites

AS OF 2019

Asheville, North Carolina

Manufacturing

Bedford, Massachusetts

Manufacturing

Bleiswijk, Netherlands

Distribution

Eugene, Oregon

Manufacturing and Research
and Development

Framingham, Massachusetts

Manufacturing

Frederick, Maryland

Manufacturing and Distribution

Inchinnan, Scotland

Manufacturing

Kiryat Shmona, Israel

Manufacturing

Marsiling, Singapore

Instrument Manufacturing

Pleasanton, California

Manufacturing

Regensburg, Germany

Manufacturing and Research
and Development

Tuas, Singapore

Distribution

Vilnius, Lithuania

Manufacturing

Warrington, United Kingdom

Manufacturing

Zero-Waste Certification Agencies

Many environmental certification agencies offer services for auditing and verifying organizations' waste management activities and zero-waste status. Agencies Thermo Fisher has worked with include:

Mitie, Synergis (Zero Waste Group), U.S. Zero Waste Business Council, UL, and Valpak.

References

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Mars, Inc.
Nestlé
Unilever
Walmart
- ² The World Bank, What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050
- ³ New York City Department of Sanitation and The World Bank, What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050
- ⁴ Consumer Price Index
- ⁵ City of Los Angeles
City of New York
City of San Francisco
- ⁶ Zero Waste Europe
- ⁷ Product Stewardship Institute and OECD, The State of Play on Extended Producer Responsibility (EPR): Opportunities and Challenges, June 2014.
- ⁸ NRDC
- ⁹ UL Zero Waste

For questions, contact Sustainability@thermofisher.com

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