COMPOSTING CONSORTIUM

What will it take for us to get to zero waste? Composting plays an essential role.

4 Steps to a More Resilient Composting System in the U.S.

Insights from the Composting Consortium

About the Center for the Circular Economy at Closed Loop Partners

The Center for the Circular Economy is the innovation arm of Closed Loop Partners, a leading circular economy investment firm in the United States. The Center executes research, analysis and pre-competitive collaborations to accelerate the transition to a circular economy in which materials are shared, re-used and continuously cycled.

About the Composting Consortium

The Composting Consortium is a multi-year collaboration across the entire value chain to pilot industry-wide solutions and build a roadmap for investment in technologies and infrastructure that enable the recovery of compostable food packaging and food scraps. The Composting Consortium is managed by Closed Loop Partners' Center for the Circular Economy. PepsiCo and the NextGen Consortium are founding partners of the Consortium. Colgate-Palmolive, Eastman, The Kraft Heinz Company, Mars, Incorporated, and Target Corporation joined as supporting partners, and the Biodegradable Products Institute, US Composting Council and the U.S. Plastics Pact joined as industry partners. Our advisory partners include 5 Gyres, Compost Research & Education Foundation (CREF), Foodservice Packaging Institute (FPI), Google, ReFED, the Sustainable Packaging Coalition (SPC), TIPA Corp Ltd., University College London, University of Wisconsin Stevens Point, Western Michigan University and World Wildlife Fund (WWF).

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Composting in the U.S. Today

In the transition to a circular economy—one where waste is eliminated, materials are circulated and nature is regenerated—we need to consider the key role of one of the earliest forms of material cycling: composting. In its most basic function, composting converts materials that are typically perceived as waste—discarded food scraps, biosolids, yard waste and tree trimmings, even compostable packaging—into compost, a valuable, renewable resource.

Through a process that reflects natural decomposition cycles, composting provides essential ecological services and unearths additional material value. Compost can replenish degraded soils by restoring beneficial microbes necessary for healthy plant growth. It serves as the 'glue' that binds soil together, preventing erosion and promoting the biological health of the surrounding ecosystem. Cities use compost in green infrastructure projects to aid in stormwater management by reducing runoff and conserving water. By redirecting organic materials from landfill, where they would release methane, the creation of compost also mitigates greenhouse gas emissions and plays a key role in combatting climate change.

As we face increasingly urgent climate risks, rapidly depleting agricultural land and a growing food waste crisis, composting can keep a range of organic materials in play, driving value across our food system and enabling a more resilient, circular future.

The Origins of Composting
When and why did composting facilities grow in the United States?

Most commercial composting facilities in the U.S. today are permitted and set up to accept only yard waste. In the late 1980s and early 1990s, driven by the waste industry and municipalities' rising concerns that yard waste would quickly overfill landfills, dozens of U.S. states passed laws that banned yard waste from entering landfills. This resulted in rapid investment across the U.S. to establish the organics infrastructure we have today.

The Evolution of Composting

How has composting changed over the years?

In 30 years, a lot has changed—the climate crisis has become significantly worse, with food waste a top contributor to greenhouse gas emissions, and the global waste crisis more visible than ever. In response, policies about food waste and packaging waste recovery are changing, cities have established zero waste goals and consumers are increasingly aware of the environmental impact of their purchases.

While solutions to prevent food waste from the outset must take precedent, composting—alongside other solutions like anaerobic digestion—now plays an important role in transforming food scraps into energy and organic commodities like compost and engineered soil. The compost stream is now more diversified, with materials beyond just yard waste.

Additionally, driven by a demand for alternatives to traditional fossil fuel-based, single-use plastic packaging, compostable packaging material has risen in volume in recent years, adding another variable to the organics stream—and the market for compostable packaging is poised to grow 17% annually between 2020 and 2027[1]. Some local municipalities have banned single-use plastic foodware, with restaurants turning to compostable packaging as an alternative. While compostable packaging presents a potential opportunity to recover the food scraps that come with food packaging, its rapid growth trajectory is not matched with a similar growth in recovery capacity. Only 2% of composting facilities in the U.S. today accept and process compostable packaging[2].

The composting industry is now at a turning point. Architecting an industrial composting system that can effectively process large volumes of food waste, and the compostable packaging that may come with it, will require restructuring economic incentives to accept these materials, aligning policy creation with infrastructure expansion, expanding access to composting and educating toward new patterns of consumption.

To begin, we identified four initial steps needed to advance these changes.

1 Data Bridge Market Research
2 Closed Loop Partners Center for the Circular Economy Analysis; US EPA (2020); BioCycle Associates Inventory Data

The Path Forward

4 initial steps to advance a more resilient composting system in the United States

1 Strengthen economic incentives for composting facilities to process food waste and food-contact compostable packaging

What Is Happening Today: Revenue at composting facilities has historically been driven primarily by tipping fees, rather than product sales. As incoming feedstock diversifies with both food scraps and compostable packaging, it becomes more complex and costly to manage. These complexities—like contamination that accompanies new materials—require more labor, different equipment and/or more land, and drive up operational costs. These growing costs are not covered by tipping fees meant to cover just yard waste processing.

What Needs To Be Done: Composters must be adequately compensated as they transition away from processing just yard waste to processing yard waste as well as food waste and certified-compostable packaging. Support for diversion of food waste also includes support for the development of new and expanded end markets. Accelerated adoption of policies and procurement practices that tap into the benefits of compost utilization (such as reduced need for chemical fertilizers and pesticides) ensures that the industry scales sustainably and operators are made whole for their contributions to circularity in organics.

2 Address physical and chemical contamination of compost, both upstream and downstream

What Is Happening Today: Composting facilities are the last stop in the cascade of contaminants that enter the waste stream further upstream, from an industrial facility or from consumer discards. In addition to pollutants and chemicals, non-compostable, plastic packaging that ends up in the composting stream is the biggest challenge for composters today. Once contamination gets into source-separated organics, it is expensive and challenging to get out. For composters who operate on tight profit margins, this poses significant challenges.

What Needs To Be Done: Mitigating contamination begins upstream. Eliminating pollutants—such as PFAS and persistent herbicides that negatively affect compost utilization or impose costly treatment requirements at the organics recycling facility—is critical. Look-alike packaging that appears compostable but is not must also be designed out. Labeling for certified-compostable packaging must be standardized, to reduce confusion and complexity and clean up the waste stream. It is critical for key industry players, such as product manufacturers, brands and government agencies, to use consistent communications and labels, so that compostable packaging and products end up where they are supposed to. Certifying bodies are also an important part of this process, and it is up to manufacturers and brands to seek certification to add credibility to their products and claims. Packaging regulations that set certification, design, labeling and food-contact requirements can help reduce confusion. Further downstream, investment is needed in technologies that remove contamination and improve source separation of certified food-contact compostable packaging. The innovation landscape today includes artificial intelligence technology that helps identify and pick out contamination from the stream, digital watermarking technology that helps compost manufacturers automatically identify compostable packaging, and compostable or laser-etched fruit stickers that help address micro-plastic challenges in composting.

What is considered contamination?

To a composter, contamination is anything not explicitly accepted by a facility OR materials that the facility is not set up to process. This includes chemical pollutants like PFAS and persistent herbicides, and all packaging that is not certified-compostable, like plastic takeout containers or paper cups with plastic lining.

3 Support the transition and expansion of composting infrastructure

What Is Happening Today: Today, the composition of the organics stream is changing. More food waste is entering the composting stream, and compostable packaging design development has outpaced the speed at which materials recovery infrastructure can adapt.

What Needs To Be Done: In tandem with economically viable contracts with municipalities and commercial entities that divert organics, infrastructure capacity must be built, expanded and retrofitted to accommodate food waste diversion. In the short- and medium-term, upgrading existing composting facilities that can only accept yard trimmings is necessary to enable successful composting of source-separated food scrap streams. This includes investing in feedstock receiving, labor, proper permits, storm water management, and pad and equipment upgrades. If diverting certified-compostable packaging does improve the total quantity of food scraps diverted, all certified-compostable packaging that enters the feedstock stream should meet one of these tests: either it provides economic value to the compost facility or it remains a neutral input in the composting process, so that packaging does not negatively impact the quality of the finished compost product or interfere with the breakdown times composters need to meet today.
In the long-term, new projects and facilities that accept all valuable feedstock, which may include certified compostable packaging as well as food scraps, are needed to expand capacity.

4 Support local, state and federal legislation that incentivizes organics diversion

What Is Happening Today: Policies on infrastructure development, labeling regulations and extended producer responsibility (EPR) are critical to the long-term success and health of the composting industry. Until recently, there has been little legislation targeting organics recycling. Now, the tides are changing. California, for example, has passed two comprehensive laws: SB-54, a plastic pollution prevention and EPR bill, as well as SB-1383, which requires organic waste disposal to be reduced by 75% by 2025. Similarly, Colorado passed what is considered to be the most comprehensive EPR bill in the country, joining a small but growing list of states including California, Maine and Washington in establishing state-specific producer responsibility models. When thoughtfully constructed, EPR can be an opportunity for brands and producers to exemplify leadership and capture long-term value. To date, dozens of the world's largest consumer goods brands have made commitments to replace their packaging with recyclable, compostable and reusable materials by 2030.

What Needs To Be Done: It will require aggressive and diverse capital and thoughtful legislation to ensure that organics recycling infrastructure is scaled to meet ambitious municipal goals and growing consumer demand. Regulation such as organics disposal bans and mandates, local requirements to make curbside and/or drop-off organics recycling services available to all households, and pay-as-you-throw schemes are critical tools to improving the system. However, when crafting these regulations, policymakers must consider the operational realities of composting facilities and drive the appropriate economic incentives to achieve the infrastructure upgrades necessary for the composting system to scale up. Through collaboration with these stakeholders and composters, the Composting Consortium is analyzing existing infrastructure, policy and value chains and providing recommendations for how the U.S. can scale a thriving industrial composting industry, where the compostable packaging and food scraps going to landfill is minimized and the industries that play a critical role in achieving that vision are supported.

Building Long-Term Impact

Collaboration among diverse stakeholders creates long-term impacts. By working collaboratively and applying a systems-level approach to our work, we can move the needle more quickly on the challenges within the composting industry. Buy-in from all stakeholders—compost manufacturers and facilities, waste haulers, brands, packaging manufacturers, investors, NGOs and government agencies—is critical. Creating scalable, systemic changes that drive circularity is the fundamental mission of Closed Loop Partners, and that vision is shared by the Composting Consortium. By working together, we can increase the diversion of resources from landfill to a more beneficial use, and scale composting systems that play a key role in achieving zero waste and climate goals.

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