Compostable Bioplastics Are Bad for the Environment and Humanity

An Alarming Scientific Overview

Executive Summary

Compostable bioplastics marketed under ASTM D6400 and TUV standards were developed with good intentions. In practice, however, they fail to deliver meaningful environmental benefits and instead create significant risks to human health, municipal waste systems, agricultural resources, and global climate goals.

Key findings documented in this overview:

- The vast majority of these materials are not accepted or processed by industrial composting facilities and are instead routed directly to EPA-regulated landfills.
- Once in landfills, they undergo premature biodegradation, releasing potent greenhouse gases (GHGs), primarily methane, well before landfill gas (LFG) collection systems become operational.

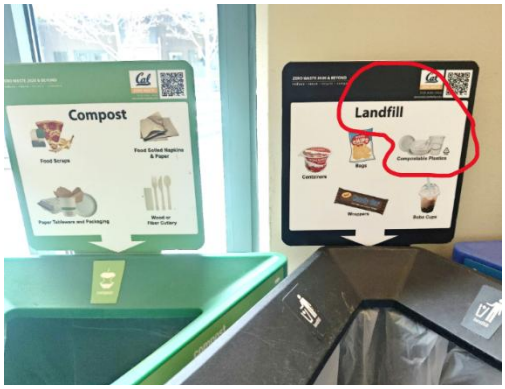

Figure 1: Compostables at U.C. Berkeley

- Widespread contamination of recycling and organics streams has led dozens of major municipalities—including more than 24 cities in California and programs across more than 20 states—to ban or severely restrict curbside collection.
- Production relies on genetically modified corn grown with chemical pesticides and fertilizers, driving up food prices, consuming disproportionate farmland, and contaminating water resources.
- These materials violate FTC Green Guides (Part 260) marketing claims, offer inferior food-preservation performance, and are unsuitable for medical applications.

In contrast, RNG Plastics technology provides a true circular solution: it is designed to be safely recovered as renewable natural gas (RNG) / biogas at existing EPA Landfill Methane Outreach

Program (LMOP) facilities, capturing methane that would otherwise escape while maintaining or exceeding the performance of conventional plastics.

This white paper presents the evidence and urges policymakers, manufacturers, retailers, and consumers to reject misleading "compostable" claims in favor of genuine sustainable alternatives.

1. Composting Failure: Not Viable at Industrial Facilities or Home Composters

Industrial composting facilities operate on tight 90-day cycles to remain economically viable. D6400/TUV-certified bioplastics require significantly longer residence times and higher temperatures than most facilities can provide.

- The U.S. Environmental Protection Agency maintains no verifiable records of any substantial volume of bioplastics being successfully composted at its approximately 1,200 regulated landfills.
- Independent surveys consistently show that 99% or more of U.S. industrial composting facilities do not accept or process these materials.
- Home composting systems—even premium units costing hundreds of dollars—likewise fail to break down D6400/TUV bioplastics under real-world conditions.

Result: Virtually all "compostable" bioplastics enter the waste stream as contaminants.

2. Direct Routing to Landfills and Volume Increase

Because they are rejected by both recycling and composting streams, compostable bioplastics are routinely landfilled. This practice doubles or triples the plastic waste volume compared with conventional plastics that can be mechanically recycled or down-cycled.

3. Premature Biodegradation and Methane/CO2 Emissions in Landfills

According to the Biodegradable Products Institute (BPI) and research from the University of New Hampshire, once biodegradation of these materials begins in a landfill environment, it does not stop—even at low temperatures.

- Landfill conditions (low oxygen, variable moisture, and temperatures that can reach 140 °F in upper layers) trigger anaerobic decomposition.
- This process releases methane—a greenhouse gas approximately 25–30 times more potent than CO_2—long before LFG collection systems are installed and operational (typically 4–6 years after burial).
- Aerobic digestion may begin first in the upper layers, quickly converting to anaerobic conditions and generating substantial methane emissions.

Feature	Home Compostable Plastics	D6400 Plastics
Temperature range	40-140 degrees Fahrenheit	122-131 degrees Fahrenheit
Oxygen levels	Low to moderate	High
Moisture levels	High	Low to moderate
Time to compost	6-12 months	12-18 months

Figure 2 - **BPI Chart**: Home compostable plastics vs. D6400 plastics – temperature, oxygen, moisture, and time-to-compost ranges clearly show incompatibility with landfill realities.

4. Widespread Municipal and State Rejection

Contamination of organics and recycling streams has prompted decisive action:

- At least 24 major California cities have banned or stopped curbside collection of compostable plastics (including Alameda, Anaheim, Berkeley, Burbank, Carlsbad, Davis, Fremont, Glendale, Irvine, Long Beach, Los Angeles, Oakland, San Diego, San Francisco, San Jose, and others).
- Similar restrictions or outright bans exist in a large majority of municipalities across more than 20 states (CO, WA, OR, and others).
- These decisions are driven by both operational contamination and the presence of endotoxins and pathogens (Salmonella, E. coli, Neisseria meningitidis) that can harbor in the porous material.

5. Regulatory Violations

- **FTC Part 260 Green Guides**: Compostable bioplastics cannot legally be marketed as “compostable” when they fail to meet the required performance criteria in customary disposal environments.
- **California SB 1046 and related Zero-Waste policies**: Promotion of these materials directly contradicts state goals for genuine waste reduction and GHG mitigation.

6. Food Preservation, Medical, and Safety Deficiencies

- Oxygen Transmission Rate (OTR) testing shows high porosity and variable gauge, leading to food spoilage in roughly half the time of conventional plastics.
- The same porosity allows viruses and bacteria to pass through, rendering the material unsuitable for medical applications.
- Endotoxin harboring creates additional public-health risks in both food-service and medical contexts.

7. Agricultural and Economic Impacts

- Feedstock is overwhelmingly genetically modified corn grown with chemical pesticides and fertilizers banned in much of Europe and Asia.
- Producing one ton of PLA generates approximately 1.2 tons of waste and requires water-intensive farming that contaminates groundwater.
- Full-scale conversion to bioplastics would consume up to 87% of current U.S. agricultural acreage—an unsustainable practice that drives up grain, feed, and food prices according to industry analyses
- Finished products cost 2–4 times more than conventional plastics and require 2–3 times more truckloads for shipping, increasing petroleum use and logistics emissions.

8. Lifecycle Carbon and Sustainability Analysis

Cradle-to-cradle studies demonstrate that compostable bioplastics deliver **no real net carbon reduction** and, in many cases, increase overall energy consumption when farming, processing, transportation, and landfill emissions are fully accounted for. They are not a sustainable farming practice and fail every test of true circularity.

Conclusion and Call to Action

While compostable bioplastics were introduced with good intentions, evidence shows they fall short of delivering meaningful environmental benefits. They exacerbate landfill methane and CO2 emissions, contaminate waste infrastructure, threaten food safety and human health, and impose disproportionate economic and agricultural burdens.

RNG Plastics offer the only proven, EPA-aligned circular solution available today. Engineered to biodegrade safely in regulated landfills and convert directly into renewable natural gas/biogas, RNG Plastics capture methane rather than release it, require no new infrastructure, maintain full performance parity with conventional plastics, and operate at a modest 2–5% cost premium, and at times below virgin resin costs.

Manufacturers, retailers, and policymakers are urged to reject misleading “compostable” labels and adopt RNG Plastics technology—the only packaging solution that truly supports the EPA’s mission, complies with FTC rules, and delivers measurable climate and economic benefits.

Contact For technical data, testing support, or licensing discussions: **Hello@RNGplastics.com**

References (full bibliography available upon request and will be expanded in the final Word version)

- BPI and University of New Hampshire biodegradation studies
- EPA Landfill Methane Outreach Program (LMOP) documentation
- FTC Part 260 Green Guides
- California legislative records (SB 1046, AB 1201, SB 54 implementation 2026)
- Independent OTR and lifecycle assessments
- Municipal waste-management reports from listed California cities and other states

