



COMPOSTABLE COFFEE POD FACT SHEET: CUTTING TO THE CHAF

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Compostable Coffee Pods: Fact vs. Fiction

With the recent publication of Environmental Defense's Wall of Shame, compostable coffee pods are back in the spotlight, and with that, the confusion surrounding what happens to them at end of life. This issue is part of a much larger discussion on the viability and sustainability of compostable plastics – is it a viable alternative to ethylene based plastics, or just another example of green washing by manufacturers?

If you were to believe Environmental Defense, and other detractors from large urban municipalities such as Toronto, you would think that compostable pods are ultimately ending up in the trash and piling up in our landfills. Looking at the facts, this characterization of the compostable pod is overly simplified and fails to capture the complexity and nuances of what can and should be included in a cities' waste management program. This article is designed to clear up the many misconceptions surrounding compostable coffee pods, separating fact from fiction in what has become an increasingly politicized issue.

Are compostable pods actually compostable?

In many ways, this is the million dollar question, and perhaps, the only one that really matters. Yes, compostable coffee pods, can be composted at commercial composting facilities. With specific reference to compostable coffee pods, opponents of the pod assert that it will not break down quickly enough for a cities composting system (the following is a direct excerpt from the City of Calgary's website)

Though marked "compostable", these coffee pods don't break down quickly enough for The City's composting process and may contain synthetic, plastic or other non-compostable materials. To ensure we're creating the highest quality compost possible, please leave these items out of your green cart.

However, in more than a dozen pilot tests that have been conducted to gauge how readily compostable pods can break down in a commercial composting facility, the compostable pod successfully broke down to levels that met or exceeded municipal benchmarks used for all other materials being processed. Often times, it broke down at rates higher than other food waste items that are officially included in the Green Bin program, like fruit pits and citrus peels.

These facilities represented a range of infrastructural configurations, and environmental conditions (moisture content, heat etc.), tested at facilities across Ontario and the United States. In several instances,

the coffee pods were successfully tested in municipalities that presently refuse to accept the coffee pod as part of their green bin program.

While early generations of compostable products had difficulty being processed at composting facilities, improvements in both the design and technology to manage compostable materials has made composting plant-based plastics extremely viable.

Many cities refuse to accept compostable pods (and plastics) on the premise that in addition to not breaking down, they are made up of composite resins (a combination of both organic and inorganic material), or break down into “smaller plastic particles”. This is simply not true for products that have achieved BPI certification, and in particular, does not apply to compostable coffee pods – 100% of the material used in compostable pods is organic.

It is important that when it comes to discussing compostable coffee pods, we do not conflate that product with other non-compostable bio plastics that do not adhere to the same certification standards. Not all products are created equal, and neither should we treat them that way at end of life.

Do municipalities accept compostable pods as part of their organics (Green Bin) program?

Most municipalities do not accept compostable coffee pods (or compostable plastics in general) as part of their organics program.

Much of the confusion surrounding the compostability of coffee pods stems from this decision – if a municipality doesn’t accept it, then it must not be compostable! This is the reasoning often used by detractors of the pod, i.e. Environmental Defense, who claim that compostable pods are still ending up in the landfill as a result of being excluded from the Green Bin.

This is a valid observation, however, in this particular instance, the blame rests with the municipality for not accepting the material, and has very little to do with whether the material can actually be composted.

But surely there is a valid reason for why municipalities exclude compostable pods and bio-based plastics from the organics program? As noted in the City of Calgary’s website excerpt above, compostable pods are not accepted in the Green Bin due to the perceived speed at which it breaks down in a commercial composting system.

While this may have been the case in years past, modern compostable coffee pods (such as the PurPod), readily break down in a range of composting systems. In fact, I would encourage any municipality who is reticent about accepting compostable pods, to see for themselves and test them at your facility. The City of Toronto, Region of Peel and City of Hamilton all have – and in every instance, the pod successfully broke down in the predetermined window specified by the municipality. While these municipalities still continue to exclude the compostable pod from the Green Bin, it is not due to their inability to break down in existing composting systems.

But don't compostable pods lower the quality of the compost?

Detractors of the compostable pod, and compostable plastics in general, express concerns that including these materials in an organics program will lower the quality of the final compost. Before answering that question, let's consider what a compostable coffee pod is made of:

- Kraft paper
- PLA (Polylactic Acid)
- Coffee Chaff
- Coffee Grounds

By weight, coffee grounds make up more than 85% of a used single serve compostable pod, while coffee chaff (used in the brown ring surrounding the pod) makes up approximately 5%. Approximately 90% of a compostable pod is made up of coffee – which is often seen as a nitrogen rich additive to a compost pile that provides bacteria the energy they need to turn organic matter into compost. In certain composting applications, coffee grounds can be used as a substitute for manure when adding nitrogen content to a compost pile. The remaining 10% of the compostable pod (PLA and Kraft Paper) readily break down under the moisture, temperature and pH levels found in commercial composting sites. In short, including compostable pods DOES NOT negatively affect the quality of compost in a commercial composting site. In fact, there is strong evidence to suggest that the used coffee grounds will actually *improve* the quality of the compost.

Won't compostable pods be pre-screened as a contaminant in a commercial composting system?

Many commercial composting sites employ a pre-screen to limit the amount of contamination entering into the system. This includes plastics, metal etc. – any non-organic material that will not break down, or compromise the quality of the final compost.

Given that compostable pods mimic the properties of a plastic pod (with respect to size, shape etc.), facility operators have often claimed that compostable pods will be pre-screened before ever making it into the system. This is legitimate concern, but one that can be readily remedied by changing the way facilities screen for materials.

Did you know that the City of Toronto's Organics program allows diapers and sanitary products to be included in the Green Bin? Neither of those two material categories will readily break down in a commercial composting system. Perhaps of even greater concern, Toronto, as well as cities such as Ottawa and Peel Region, allow households to put their organics in plastic bags. This plastic, if not pre-screened, will *never* break down in a composting facility, and instead, gets shredded into tiny pieces that end up in the compost that is produced. Given that one of the concerns surrounding compostable pods cited by municipalities is the potential to contaminate the final compost, it is perplexing that plastic bags somehow get the green light.

The decision to exclude a material that is demonstrably compostable (compostable coffee pods), but allow for diapers and personal hygiene products cannot be readily rationalized.

Won't consumers get confused between plastic and compostable pods and put them in the wrong bin?

Consumer confusion and awareness is a legitimate concern, not just with respect to coffee pods, but the full spectrum of new packaging materials that manufacturers are putting into the market. Telling consumers to put a plastic pod in the trash or recycling, but a compostable pod in the Green Bin (but not the Blue Bin) can lead to significant confusion and angst for well-intentioned consumers who want to do the right thing.

However, having something be difficult, doesn't mean that we shouldn't try. When we consider how the Blue Box has evolved over the past decade – moving from primarily paper based packaging towards light weight and composite plastics, we have asked households to evolve their recycling habits as well. While this is still very much a work in progress, consumers now have more information than ever to make informed recycling decisions, and find ways to keep light weight plastics out of the trash, and in the Blue Bin. Why can't we look at compostable coffee pods the same way?

Clearly distinguishing between plastic and compostable pods (both at the point of purchase and on the product themselves), in addition to clear and consistent messaging from a municipality, will be critical in getting consumers to adopt behaviors that result in the most sustainable outcomes. With respect to the compostable coffee pod, this means including it as part of the Green Bin, and not the trash.

The numbers don't lie – composting one tonne of compostable coffee pods abates 2.33 tonnes of carbon. For every compostable coffee pod that ends up in the landfill, municipalities are missing out on a significant opportunity to abate carbon, and often at a much lower cost to manage than the costs of recycling.

When we compare that to the potential carbon savings from the plastic materials that we tell people to put in the Blue Bin (PET, Polypropylene, Polystyrene, LDPE), composting a PLA based coffee pod abates almost 40% more carbon than attempting to recycle the aforementioned plastics (where carbon savings from recycling ranges from approximately 1.61TCO_{2e} for Polystyrene to 1.73TCO_{2e} for PET).

What actually happens to a compostable pod if it ends up in the landfill?

Let's assume for a moment that Environmental Defense is right, and that hundreds of thousands of compostable pods are ending up in our landfills every year, what is the net environmental impact?

The truth is, not much. In the absence of the correct moisture content, oxygen levels and temperature, compostable pods will break down over a prolonged period, emitting approximately 0.12TCO_{2e} for every tonne of compostable pods landfilled.

Given that the compostable pod is comprised entirely of organic material, there are minimal risks posed to water/air quality, or leachate contamination. In many ways, the impact of landfilling compostable pods is that they will physically take up space.

Where the story becomes much more interesting from a sustainability perspective, is when we compare the net impact of manufacturing a compostable pod, and compare it to the plastic alternative?

Using life cycle data from EcolInvent, and modelling both the upstream (pre consumption) and downstream (end of life) carbon impacts of plastic coffee pods vs. a compostable coffee pod, we observe a telling result:

Even if every compostable pod is landfilled, and every plastic pod is recycled, a compostable coffee pod will have a lower overall carbon footprint than either a PET, Polystyrene or Polypropylene coffee pod. How is that even possible? When we consider the carbon impact of manufacturing each pod type (resource extraction, manufacturing and transport to market), the carbon intensity of making a plastic pod is more than double that of the compostable PLA pod (ranging from 5.14/TCO₂e to 5.46/TCO₂e for various plastic pods, compared to 2.5/TCO₂e for the compostable pod). In the extreme scenario where every plastic pod is recycled, and every compostable pod is landfilled, the carbon reduction attributable to recycling the plastic pod is insufficient to offset the carbon impact of actually making the pod itself.

Long story short, from an environmental perspective, it makes more sense to use compostable coffee pods and have them all go to landfill, than to use a plastic pod and have them be recycled (which in and of itself, is a highly unlikely outcome).

This finding is particularly salient given the decision by some large CPG companies to transition away from compostable coffee pods and return to the plastic format. This unequivocally results in an inferior environmental outcome, which highlights the need to undertake a full life cycle analysis before implementing changes to product design.