



RECYCLING

# DIVISION NEWSLETTER

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## *Exploring the Multilayer Challenges of Plastics Recycling*

### **In This Issue:**

(Plastics) Sustainability in the News

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Patent Analysis of Recycling Technologies

# Editor's Corner

In October this year, I was invited to participate in a sustainability workshop and panel discussion hosted by the University of Massachusetts Lowell (UML, or "UMass Lowell" to friends of the school). Two local schools, Lowell High and Greater Lawrence Technical High School, sent about 45 students. The workshop was structured with a tour of the school's impressive polymer processing labs, including time with extrusion, injection molding, and 3D printing equipment.

The organizer, Professor David Kazmer, had developed two challenges for the students to assess. Furthermore, they were invited to write a position paper on one of the challenges following the workshop. In the first challenge, students were asked to review a drinking goblet made from 4 different materials: wood, metal, glass, or plastic. In the second challenge, they were asked to address public policy to drive the sustainability of natural resources. Dr. Sumudu Lewis, UML's UTeach Director, facilitated the exchanges between the students and the panelists which included myself, Cheryl Sayer, Director of Engineering at MoldMasters, and April Herz, Recycling Enforcement Coordinator for the City of Lowell.

Professor Kazmer supplied the students with a relatively complex chart showing the embodied energy of many materials, including the four options for the goblet. As with other similar forums where people are able to have an informed discussion, the students showed an appreciation for the grey areas surrounding choices related to the environmental impact of various materials. Though wood seemed like the most environmentally friendly option, it wasn't deemed a very practical choice. That said, during the conversation, there was a distinct sense from the students that plastics manufacturing (and the companies who make a profit in this industry) is somehow tainted. When I asked directly if they believed "industry" was full of money-grubbing behavior, they nodded and raised hands enthusiastically. Some of this, of course, can be put down to naivete and a lack of appreciation for the complexity and sophistication of our modern economy. My sense is that "the kids are alright" and over

time, their outlooks will change.

But this doesn't mean that we shouldn't continue to engage and educate the next generation as well as the general population about polymers and plastics. In the face of relentless social media / memes / news programs illustrating the very real problems of plastic waste, nuanced debate is not everyone's cup of tea. SPE members, in particular, have a responsibility to their local communities to ensure that the debate does not devolve into a shouting match, with misinformation on one side and hidebound attitudes on the other. It doesn't move people, for example, to insist that life-cycle assessments continue to show plastics in a positive light when end-of-life management problems are very evident on beaches around the world. As much as we don't like to accept it, facts don't always win arguments. Narratives matter.

In this issue, we show how businesses continue to adapt to changing consumer needs while integrating sustainability in a meaningful way. Mike Bonsignore of CKS Packaging was recently appointed as Chief Sustainability Officer and we talk about how this role went from a box on an org chart to an active position with immediate implications and results. From Europe, we (via our friends at *Bioplastics Magazine* in Germany) summarize the patent landscape for plastics recycling technology. Keen readers might be surprised to learn that the US is more than pulling its weight in this area. You can download the complete report at <https://www.bioplasticsmagazine.de/202106/PATENTS.pdf>

Mark your calendars for February 17-18, 2022 when we expand our horizons to Europe for the Recycling and Circular Economy (RACE) event. Topics will include advanced physical recycling, developments in European collaborations (CEFLEX), and much more. |

*Cover photo courtesy of University of Massachusetts, Lowell.*





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*[PlastiVan.org](http://PlastiVan.org)*

# (Plastics) Sustainability in the News

## Keurig Agrees to Settle Coffee Pod Recyclability Suit

By **Jared Paben, Resource Recycling**

**December 7, 2021** - Keurig Green Mountain has reached a tentative class-action settlement with a consumer who is suing the company over its coffee pod recyclability claims.

The case, which was first filed in U.S. District Court for the Northern District of California in November 2018, alleges that the company is deceiving consumers by claiming its polypropylene K-Cups are recyclable.

Details of the deal, which is the second major settlement over brand owners' recyclability claims in recent months, haven't been made public yet.

Lafayette, Calif. resident Kathleen Smith sued Keurig Green Mountain, alleging that Keurig instructed consumers to remove the metal foil from the used K-Cups, compost or discard the coffee grounds, and then recycle the cup and filter, while urging consumers to "check locally to recycle empty cup."

But the lawsuit alleges the cups fall through sorting screens at MRFs because of their small size – especially after they're compacted in collection trucks – and they're disposed of. If they're not disposed of by the MRF, the cups can contaminate other recyclables, the suit alleges. And even if they are sorted, baled and sold to a plastics reclaimer, the residual metal and food contaminants render them non-recyclable or difficult to recycle, according to the lawsuit, which also emphasized a lack of markets for even non-contaminated K-Cups.

Keurig asked the case to be dismissed, citing a host of reasons. Among them, Keurig claimed the plaintiff failed to differentiate between the company's original coffee pods and its recyclable PP pods, which were introduced in 2017 after testing with recycling companies to ensure their recyclability.

In its motion to dismiss the case, Keurig also insisted its marketing language is compliant with the Federal Trade Commission's Green Guides, which are referenced in California statutes, because Keurig discloses to consumers that the cups aren't recyclable in all communities and instructs them to "check locally."

Keurig was dealt a legal setback in June 2019, when Judge Haywood Gilliam, Jr. declined to dismiss the case. And in September 2020, over Keurig's opposition, Gilliam approved an order certifying the class represented by the plaintiff. The class includes "all persons who purchased the Products for personal, family or household purposes in California (either directly or through an agent) from June 8, 2016 through the present," according to his ruling.

Keurig Green Mountain acquired Dr Pepper Snapple Group in 2018. The company is now part of Keurig Dr Pepper, one of the largest beverage companies in North America.

## Chemically Recycled PLA Now Available

**Bioplastics Magazine, Issue 06**

**December 2021** - Total Corbion PLA (Gorinchem, The Netherlands) has launched the world's first commercially available chemically recycled bioplastics product. The Luminy® recycled PLA grades boast the same properties, characteristics and regulatory approvals as virgin Luminy PLA, but are partially made from post-industrial and post-consumer PLA waste. Total Corbion PLA is already receiving and depolymerizing reprocessed PLA waste, which is then purified and polymerized back into commercially available Luminy rPLA.

The commercial availability of recycled PLA (rPLA) offers brand owners the opportunity to make products from rPLA, with the luxury of having original food contact and other certifications in place. Using rPLA can contribute to meeting the recycled content targets of brand owners.

Thomas Philipon, CEO at Total Corbion PLA, sees this as a logical step towards an even more sustainable offering: "Our company's vision is to create a better world for today and generations to come. This ability to now efficiently receive, repurpose and resupply PLA is a further demonstration of the sustainability of our product and the demonstration of our commitment to enable the circular economy through value chain partnership."

François de Bie, Senior Marketing Director at Total Corbion PLA is proud to launch this new product line of Luminy PLA and encourages interested parties to get in touch: "The ability to chemically recycle post-industrial and post-consumer PLA waste allows us to not only reduce waste but also keep valuable resources in use and truly 'close the loop'. For our customers, the new, additional end-of-life avenue this provides could be the missing piece in their own sustainability puzzle, and we look forward to solving these challenges together."

As an initial offering, grades will be supplied with 20 % recycled content using the widely accepted principles of mass balance. "As we are currently ramping up this initiative, the initial volumes are limited but we are confident that rPLA will grow to be a significant part of our overall sales revenues" states de Bie. Currently, Looplife in Belgium and Sansu in Korea are among the first active partners that support collecting, sorting and cleaning of post-industrial and post-consumer PLA waste. The resulting PLA feedstock is then used by Total Corbion PLA to make new Luminy PLA

polymers via the chemical recycling process. Total Corbion PLA is actively looking for additional partners from around the world that will help to close the loop.

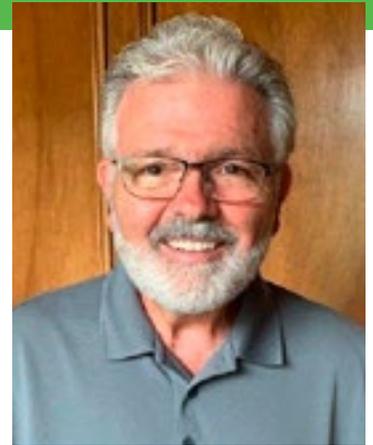
Total Corbion PLA expects that the growing demand for rPLA will also boost the collecting, sorting and reprocessing of post-use PLA for both mechanical and chemical recycling, as de Bie explains further: "At Total Corbion PLA, we are actively seeking to purchase more post-industrial and post-consumer PLA waste, creating value for the recycle industry as a whole." |

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# 5 Questions for Mike Bonsignore, Chief Sustainability Officer at CKS Packaging



**Conor Carlin: You recently added Chief Sustainability Officer to your title. How and why did this come about?**

Mike Bonsignore: In August of this year, our CEO, John Sewell, and our newly appointed President, Bob Oliver, asked me to take on this role. CKS Packaging has a demonstrated history of commitment toward being a good steward of the environment. This includes significant charitable giving and outreach in the communities where we operate. So, making the responsibility for sustainability strategy and processes a part of our formal organizational structure was a decision that made perfect sense.

**CC: What have you learned about sustainability in a customer-facing role vs. internal company-facing roles?**

MB: There's a lot to learn, but there are a few initial lessons that I've discovered. First of all, suppliers have pretty much the same concerns as their customers. We both ask ourselves questions like, "Are we doing everything that is realistically feasible to manage and reduce our footprint?" and "What metrics should we be reviewing and what are the actionable steps to improve?" After that, we have to talk about how we best communicate the organization's sustainability story to our customers.

Our customers want to be confident that their strategic supplier is engaged and pursuing a realistic set of sustainability goals. To be considered a legitimate player, we need to understand that being "sustainable" is not just about recycling programs, energy efficiency and eliminating waste in the supply chain. Social responsibility and employee well-being are huge components that cannot be ignored.

**CC: What specific work has your company done to address sustainability concerns?**

MB: CKS Packaging has done a great deal to address these concerns, and has been formally recognized by the community and by our customers. Below are few examples of recent efforts:

- Our primary operating metrics are about how efficiently we convert resin into useful products. We focus, therefore, on minimization of virgin resin use, energy usage, and labor efficiency. Significant investments in newer generation machinery, infrastructure

and lighting fixtures are having a positive impact on resource usage per pound of resin processed.

- CKS utilizes Recycled Corrugated for secondary packaging needs. In 2020, this resulted in saving 126.7M gallons of water, 307.7m trees, 72.4M kWh of power, 18.1m tons of CO2 prevented and 59.7m cubic yards diverted from landfill. These numbers will grow in 2021.
- Container lightweighting Initiatives with customers have resulted in millions of pounds less virgin resin used annually, plus the associated energy that is consequently not used in the conversion process.
- CKS has developed an on-site business model that eliminates freight and associated diesel fuel. We estimated that current operations are saving approximately 4,500 metric tons of carbon vs. the conventional stand-alone plant model.

**CC: When you attend plastic industry conferences, what are you paying attention to these days?**

MB: I am constantly on the lookout for information/knowledge on recycling and sustainability. The recent SPE Blow Molding Conference in Atlanta had some very informative sessions on these topics. Finding practical/actionable ways to improve our approach to sustainable improvements strategic objective.

**CC: Crystal ball time: where will we be in 5 years regarding industry efforts in plastics recycling?**

MB: I see more involvement from resin suppliers, converters and brand owners with the development of a viable recycling infrastructure. Without significant improvements in recycling rates and associated costs, our industry will likely face hardships in terms of consumer perception. We also risk losing out as a cost-competitive packaging alternative to heavier materials. Ultimately, I see the industry leaders stepping up to develop systems that are both sustainable and economically viable. |

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# Patent News

## Europe and USA are leading innovation in plastic recycling and alternative plastics globally, patent data shows

From a global perspective, Europe and the USA are leading innovation in plastic recycling and alternative plastic technologies, i.e. renewable carbon plastics, a new study published in October by the European Patent Office (EPO, headquartered in Munich, Germany) shows. Europe and the USA each accounted for 30% of patenting activity worldwide in these sectors between 2010 and 2019, or 60% combined. Within Europe, Germany posted the highest share of patent activity in both plastic recycling and bioplastic technologies (8% of global total), while France, the UK, Italy, the Netherlands and Belgium stand out for their higher specialisation in these fields.

Titled *Patents for tomorrow's plastics: Global innovation trends in recycling, circular design and alternative sources* [1], the study presents a comprehensive analysis of the innovation trends for the period 2010 to 2019 that are driving the transition to a circular economy for plastics. The report looks at the number of *international patent families (IPFs)*, each of which represents an invention for which patent applications have been filed at two or more patent offices worldwide (so-called *high-value* inventions). It aims to provide a guide for business leaders and policymakers to direct resources towards promising technologies, to assess their comparative advantage at different stages of the value chain, and to highlight innovative companies and institutions that could contribute to long-term sustainable growth.

### Chemical and biological recycling methods with the highest number of patents

The study highlights that of all recycling technologies, the fields of chemical and biological recycling methods generated the highest level of patenting activity in the period under review. These methods accounted for 9,000 IPFs in

2010–19, double the number filed for mechanical recycling (4,500 IPFs). While the patenting of standard chemical methods (such as cracking and pyrolysis) reached a peak in 2014, emerging technologies such as biological methods using living organisms (1,500 IPFs) or plastic-to-monomer recycling (2,300 IPFs) now offer new possibilities to degrade polymers and produce virgin-like plastics.

### Healthcare and cosmetics & detergent industries lead in bioplastic innovation

In the area of bioplastic inventions, the study finds that the healthcare sector has by far the most patenting activity in total (more than 19,000 IPFs in 2010–19), despite accounting for less than 3% of the total demand for plastics in Europe. However, the cosmetics and detergents sector has the largest share of its patenting activity in bioplastics, with the ratio of bioplastics IPFs to conventional plastics IPFs being 1:3, compared to 1:5 in the healthcare sector. Packaging, electronics and textiles are also significant contributors to innovation in bioplastics.

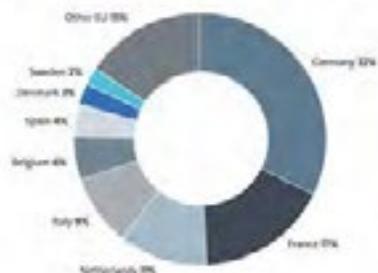
### CO<sub>2</sub> based plastics

Finally, with regard to alternative plastics technologies, the report also looks at the role of plastics production from CO<sub>2</sub>, which has been launched by a small number of companies, mainly from Europe – such as Covestro in Germany – and South Korea and can play an important role on the road to the circular economy. MT |

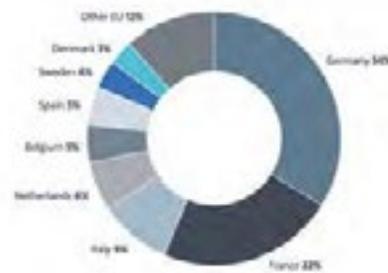
[1] Patents for tomorrow's plastics: Global innovation trends in recycling, circular design and alternative sources:

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Origin of the international patent families in **plastic recycling technologies** (2010-19) EU 27



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For more information or questions, contact Conor Carlin, Editor, at ccarlin@4spe.org or 617.771.3321.



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