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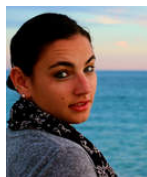


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Reinventing plastic for the circular economy

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Emerging circular economy models provide an opportunity to rethink the way we produce and reuse plastics.

Whether you're sitting at your desk, kicking back at home or just about anywhere else, stop and take a moment to look around. How many things in your immediate vicinity are made out of plastic?

From reusable coffee cups to computer keyboards to nouveau compostable plastic food containers, stuff made out of polymers is everywhere.

The good news, from an environmental perspective, is that more and more products — [running shoes](#) and [car interiors](#) made from old water bottles, for instance — are the

result of a new wave in unconventional plastic re-purposing.

Amid [the circular economy craze](#), under which business models provide for materials to be constantly cycled back into supply chains, plastics represent both a huge opportunity and a huge challenge.



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Worldwide plastic consumption continues to climb.

The world consumed [an average of 3 percent more plastic](#) every year from 2005 to 2013, reaching 202 million tons annually by the end of that period, according to market intelligence firm ICIS Industries. Demand is expected to rise by 40 million tons by 2017.

But multiple factors drive companies to take a hard look at the circular economy, which for most entails a reexamination of polymers involved in their operations.

The trend is fueled by rabid pursuit of business model innovation — in particular asset-light [sharing economy startups](#) and an uptick in [re-manufacturing](#) — along with fear of commodity price volatility, climate change anxiety, new zero-waste and recycling policies and more recognition that better resource efficiency can spell big cost savings.

"In the U.S. and Europe, 35 percent of food, water and energy is wasted," said Aron Cramer, CEO of corporate sustainability nonprofit BSR, during a recent GreenBiz webcast. "That is an environmental catastrophe, and it's economic suicide. This offers a new model that will enable people to avoid that waste."

More specifically, streamlining the way our society uses plastic could have gigantic impacts. That goes not only for environmental indicators such as consumer recycling rates, but also daunting issues such as marine plastic pollution and the carbon emissions that could be saved with less [energy-intensive \(PDF\)](#) polymer processing.

[Learn more about how companies are jumping into the circular economy at [GreenBiz16 Feb. 23-25 in Phoenix, Arizona.](#)]

"No one in the past has across industries triggered a discussion of 'What is it in plastics that we really need?'" Martin Stuchtey, director of McKinsey's sustainability and resource productivity division, recently told GreenBiz.

While highly specified plastics for different types of bags, bottles and myriad other knick knacks have become the norm, Stuchtey argued that the circular economy presents an opportunity to simplify.

"Materials are the currency of the circular economy," Stuchtey said. "We need to have a common currency."

Making materials work

Slowly but surely, plastic manufacturers and large-scale polymer users, such as [toy industry magnate Lego](#), are recognizing that refining the way plastics are manufactured and used could bring both financial and environmental benefits.

But first, let's get one thing straight: The circular economy [is not simply a catchy new name](#) for recycling materials such as plastic.

"It's not recycling. Recycling is consistent with the story, but it's only a very small part," Stuchtey said. "You must not absorb any more finite resources. It's about managing the stock."

Neil Hawkins, vice president of corporate sustainability at plastic producer Dow Chemical, said that the company is currently experimenting with several circular economy-inspired initiatives. The overarching goal: "keeping molecules at their highest values for as long as possible," Hawkins said during the recent circular economy webcast, sponsored by Dow.

One effort under the tag line of the "energy bag" involves providing a bag for customers to collect used nonrecyclable plastics and odds and ends such as plastic utensils. Dow then collects the bag, processes the contents and turns them into synthetic crude oil, one variation of waste-to-energy models.

While much better than the zero economic value that comes from throwing plastic into a landfill, there is also still room to improve reuse technology.

"Polymers are worth more per pound than the fuel is worth," said Dow Global Sustainability Leader Jeff Wooster. "If we can recycle materials back into materials, we'll always want to do that first."

Extending into another corner of Dow's business model is a push to lease cleaning solvents, rather than just selling them outright, and then take the chemicals back and reuse them. The effort illustrates how toxic substances can be handled in circular economy models — not outrightly banned, but kept in circulation and out of the biosphere.

The key with all circular economy gambits, Stuchtey notes, is avoiding "any negative externalities."

But part of the problem with plastic also lies in complex supply chains. As Stuchtey notes, polymers in many cases are a product of "over-specified functional requirements to Chinese suppliers."

Still, there is precedent in other major industrial sectors for a shift in the balance of new and recycled materials — if the economics make sense.

"Virgin metal companies said steel recycling would never get very far," the Guardian recently [noted](#). "It did."

A robust market for reused plastics also would introduce the possibility of new offshoots.

"If we create a solid reverse logistics industry, that's new," Cramer said.

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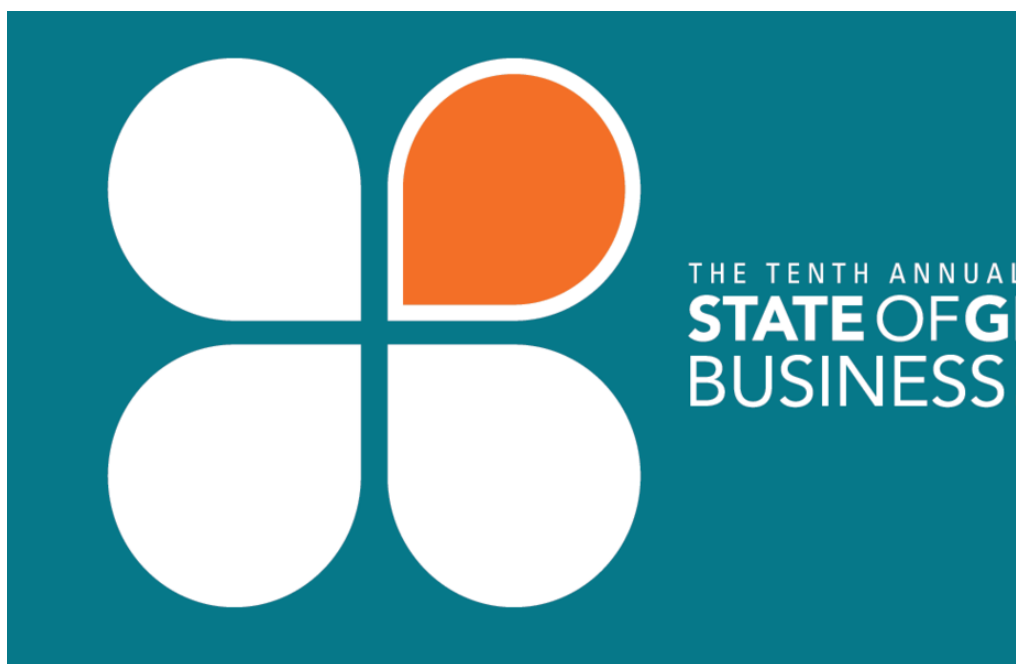
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