



SUSTAINABILITY

# Sustainability Newsletter

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## Surf's Up!



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## Chairman's Corner

### Q1 2018

Chris Surbrook, Chair, Sustainability Division

The issue of marine pollution is being discussed everywhere these days, it seems. After the Ellen MacArthur Foundation published devastating data on the amount of plastics in the ocean, the world cannot claim to be ignorant of the problem: "The best research currently available estimates that there are over 150 million tons of plastics in the ocean today. In a business-as-usual scenario, the ocean is expected to contain 1 ton of plastic for every 3 tons of fish by 2025, and by 2050, more plastics than fish (by weight)." ("The New Plastics Economy: Rethinking the World of Plastics", World Economic Forum publication, Jan 2016). The SPE Sustainability Division is proud to be working together with the PLASTICS Industry Association in Operation Clean Sweep, to help do our part in reducing plastic wastes in the water ways.

So what is to be done? Some would have us ban plastics altogether, ignoring the very real environmental and economic benefits of polymer-based materials when compared to substitutes such as

wood, glass and metals. In this issue, we offer several different perspectives on plastics and sustainability, starting with the 4<sup>th</sup> installment of Mike Tolinski's book of the same name. Mike's work remains eminently readable and practical, with useful information for both the scientist and the marketer. We also reprint a wonderful story about repurposed ocean plastics from a start-up company in Thailand.

There is no shortage of waste plastics materials, but the economics of successful recovery remain thorny and there are many overlapping agents in government, NGOs and private industry. For every plastic bag ban story, there appears to be a successful start-up story about making surf boards, shoes, swimwear, shampoo bottles, or lumber from salvaged plastics. Within the SPE Sustainability Division, we have a wealth of technical expertise on plastics recycling, compounding, bio-based materials and more. Our division will continue to create and deliver original content for major conferences such as ANTEC, RelFocus and ISRI (Institute of Scrap Recycling Industries). You can visit our website to see a complete calendar of events.

What do you think? Are we doomed to swim upstream against a powerful tide of waste plastics? Do we have the technology and the entrepreneurial mindset to make silk from the proverbial sow's ear? Join us, and join the conversation on The Chain. These issues affect all of us in one way or another. |

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# Sustainability Digest

*A selection of news and information from the wide world of plastics-related sustainability media.*

## Delta boosts its California recycling stake with acquisitions

February 9, 2018 – Jim Johnson, Plastics News

Delta Plastics of the South LLC, which already has been ramping up to expand agricultural plastic recycling in California, is now acquiring a significant recycler in the state.

Stuttgart, Ark.-based Delta Plastics acquired Command Packaging LLC and its sister company, Encore Recycling LLC, in a move that gives it both recycling and new product manufacturing capacity.

"It was just a natural fit," Delta Plastics CEO Sean Whiteley of Delta Plastics said in a Feb. 9 interview. "We share the same core operating philosophies and visions around sustainable, closed-loop plastic manufacturing. Closed-loop green manufacturing is a passion for both organizations."

A key component of the deal is the Encore Recycling unit located in Salinas, Calif., which Delta says is "California's only manufacturer of high-quality post-consumer recycled polyethylene film-grade resin."

Encore Recycling relies on used agricultural plastics to serve as a feedstock for Command Packaging to then make new products, including plastic bags for the food service, grocery and retail markets.

Los Angeles-based Command Packaging's bags are thicker than the typical grocery store bags and designed for multiple uses.

"Demand for high-quality sustainable plastic packaging is increasing. It became obvious we needed a growth partner to accelerate our expansion and meet the growing demands of the markets we serve," CEO Pete Grande of Command Packaging and Encore Recycling said in a statement.

Command Packaging uses recycled content from sister company Encore Recycling to produce thick, reusable plastic bags.

Grande talked about his plans for Command Packaging and Encore Recycling in 2013 when he was planning his new recycling venture. Grande explained the thicker plastic bags, at

2.25 mils, would be able to carry more weight and designed to be reused dozens and dozens of times. The thicker bags are a response to a California law that banned single-use bags.

Encore Recycling, like Delta Plastics, relies on used PE agricultural film for its feedstock.

The merger of the two operations means Delta Plastics can kick-start its efforts to expand ag film recycling in California. The company has been collecting agricultural film in the state for nearly two years and sending it back to Arkansas for reprocessing.

But during this time, the company ultimately decided it should establish additional West Coast operations to enable processing and manufacturing closer to collection to be more sustainable.

Delta Plastics had been in final negotiations with a few California locations for development of a new reprocessing site, but now will be able to use and expand Encore Recycling's location. Delta Plastics will install additional new equipment to wash and reprocess used film to go along with Encore's existing operations.

"It will be separate. It will be managed separately and it will be tracked separately," Whiteley said of the two portions.

Delta Plastics said an earlier \$3 million grant the company received from the California Department of Resources Recycling and Recovery to create a recycling operation is still in place.

The operations are expected to ultimately create at least 40 million pounds of clean resin each year from the Salinas location. "We're very excited about the combination of our businesses," Whiteley said.

Last year Delta Plastics indicated it was collecting about 4 million pounds of dirty plastic each month in California. That translates into about 2 million pounds of recyclable material due to the high level of dirt contamination.

Encore Recycling has 125,000 square feet under roof, enough room to greatly expand processing at that location over time, Whiteley said.

Encore Recycling's current production is used for "dozens of applications, such as new agricultural plastics, composite lumber, retail carry out bags, and even our own line of reusable bags," the company said.

Grande said his company also likes the idea of expanding Command Packaging's production to existing Delta facilities in Arkansas and Texas. Delta Plastics, just last year, acquired



Rodeo Plastic Bag & Film Inc. of Mesquite, Texas. Rodeo makes industrial plastic sheeting and bags.

"Merging the two companies together creates impressive synergies for both companies," Grande said in his statement.

Whiteley said the new deal is a culmination of talks that actually go back more than three years.

## City serves as case study in film recycling outreach

February 7, 2018 – Colin Staub, Plastics Recycling Update

Municipal programs are often short on funds, and it's easy for recycling outreach to fall on the back burner amid budget constraints. East Hartford, Conn. recently took action on the issue by partnering with a plastics industry initiative.

According to a program leader in East Hartford, the Wrap Recycling Action Program (WRAP) can substantially boost film diversion and help shift that material from curbside carts, where it's a contaminant, into the retail collections stream.

Marilynn Cruz-Aponte, assistant director of East Hartford's Public Works department, described the city's experience in a recent U.S. EPA Sustainable Materials Management webinar. East Hartford was motivated by a rising contamination rate, specifically due to improperly recycled plastic bags.

"Our recycling plant operation has been impacted by plastic film that comes through our blue bins," Cruz-Aponte said. "We have a two-hour, daily shutdown to deal with the kind of impact. For us, our concern is that quality matters, and if we don't nip this in the bud, or if we don't find a way of taking a right-hand turn or a left-hand turn, that's going to cost us in the future."

A program of the American Chemistry Council's Flexible Film Recycling Group, WRAP appealed to East Hartford officials, in part because it was so easy to implement, Cruz-Aponte said. It's an established national program that employs a business-government partnership model, which has been popular in East Hartford.

"All we had to do was tap in and tweak," she said.

The city, which has a population of about 50,000 residents, collects around 3,300 tons of recyclables per year through a curbside recycling program. Its Public Works department's Waste Services division has a \$2.5 million annual budget.

### Implementing the strategy

The city already had a partnership with a local supermarket chain called ShopRite, which was collecting film for recycling. That made it easier to launch the WRAP program. Cruz-Aponte met with the local business owner, explaining the WRAP initiative, the city's interest and the expected impact. The Public Works department formed a close relationship with the business, which Cruz-Aponte said was crucial to the program's success.

"I was able to have confidence in working with the owner, and got approval from her to have a direct working relationship with the store facilities director, for data tracking, for customer education, for hauler collection information," Cruz-Aponte said.

Support from the city's mayor was also critical, particularly in coordinating outreach and drawing media attention.

In the end, WRAP allowed the city to push for diversion of a new recycling stream at no cost to taxpayers.

"While it didn't necessarily reduce tonnage significantly, it did allow the town to promote the elimination of plastic bag use in blue bins, it supported the recycling plant goals, and then it added a new initiative that refreshes the curbside recycling message in general and reminds residents to recommit to curbside diversion," Cruz-Aponte said.

ShopRite doubled its film collections as a result of the WRAP outreach drive. Last fall, consulting and research firm More Recycling conducted an audit of the East Hartford program after it had begun. The audit found the film stream was made up mostly of plastic grocery bags. There was some contaminated film, totaling about 16 percent, but the city looked at the volume increase, without a major rise in contamination, as a big success.

"The fact that we just doubled material meant that this launch really did change behavior, and now it's really a matter of providing deeper education about the diversity of the types of plastic that can be received at retail," she said.

ShopRite continues to report sustained higher collection volumes since the WRAP launch, she said.

## China continues to constrain plastics imports

February 7, 2018 – Colin Staub, Plastics Recycling Update

Chinese authorities have issued the first five rounds of recyclable-material import permits for 2018. Compared with

2017, the country has allowed in substantially less recovered plastic and approved permits for far fewer companies across all material types.

The first five batches approve 21,300 metric tons of scrap plastic, according to data published by China's Ministry of Environmental Protection. For comparison, the China Scrap Plastics Association recently noted more than 3.5 million metric tons of scrap plastic were approved for import just in the first batch of permits issued for 2017.

The sheer number of permits issued was drastically reduced. For instance, in the first batch for 2017, there were 2,937 permits issued for import of various materials and volumes. In the first round this year, there were just 108 permits issued.

New year-end data from China Customs also quantifies the decrease in tonnages flowing into China from 2016 to 2017. Some 5.83 million metric tons of scrap plastic were shipped into the country in 2017, down from 7.35 million metric tons throughout 2016.

The year-to-year drop in plastic tonnages between 2016 and 2017 became particularly dramatic at the end of last year. In December 2016, importers brought in 740,000 tons of scrap plastic; during the same period a year later, amid restricted permits and the looming materials ban, that figure fell by more than 75 percent to just 180,000 tons imported.

## In My Opinion: How a TV segment spurred film recycling

January 4, 2018 - Mark Yates, RePlas Plastic Recycling

Earlier this year, ABC, the national government broadcaster in Australia, ran a series of programs called "War on Waste." These shows were dedicated to putting the huge amount of waste generated in the forefront of people's thinking.

The results were amazing. One segment focused on the huge reject rate at supermarkets of bananas that were too small, large or bent. Another story was on the 1 billion takeaway coffee cups disposed of every year.

But the story that caught a lot of people's attention was the volume of plastic packaging that ends up in household rubbish bins. The story also explored how some of it is recovered, demonstrating that a material normally regarded as waste can be recycled into usable everyday products. This story was so successful that the amount of packaging

collected doubled straight after the show was aired and has increased steadily since.

"War on Waste" put tracking devices into "soft" plastics collection bins at two major supermarket chains in Australia. The results were pretty damning for one of the supermarkets. One of the tracked loads went to landfill and the other went to China. When the contractor was asked where the plastic went, they were unable to give an answer. The other major supermarket had initiated a recycling effort with a company called the Red Group, which is responsible for collecting mixed-polymer packaging. The tracker that was placed in this supermarket bin ended up at a depot, where it awaited baling and shipment to market.

The "War on Waste" story looked at the processing of the plastic and a few of the end products. In the final piece of the story, it was noted that if you want to be able to recycle you must buy recycled products. Such a simple statement is the backbone of the recycling industry but seems all too often lost.

Since the airing of the story and the huge consumer demand it created, the other supermarket has approached RePlas to purchase products for their stores. That other supermarket has also signed up with Red Group to ensure their material is picked up and recycled.

Collection points have now been rolled out across the whole of Australia, a total of more than 1,000 bins. That number is constantly increasing. Back-loading systems have been instigated to help with the more remote areas of Australia. RePlas believes that the future of mixed-plastics recycling will be found in the engineering of the polymer blends and composites once better applications are found. When that happens, new markets will open. |

### Have an idea for an article?

#### Submission Guidelines

- Articles should be objective and technical
- Format: .doc or .docx
- Topics can include recycling, bioplastics, economics or innovative technologies related to polymers and sustainability

#### Email

Conor Carlin at [cpcarlin@gmail.com](mailto:cpcarlin@gmail.com)

# Plastics Sustainability

Excerpted from *Plastics Sustainability* (2012) by Michael Tolinski with permission from Scrivener Publishing LLC.

*[Editor's note: This is the fourth article in a series that will run over 6 installments. We are grateful to the publisher for granting us this unique opportunity to share excerpts from an important (and enjoyable) book on a topic that is central to our industry. The SPE Sustainability Division is proud to offer this benefit to our members. We encourage everyone to purchase the complete book which is available on Amazon.]*

## Chapter 4: Applications: Demonstrations of Plastics Sustainability

Major plastics consuming industrial sectors all have tried various uses of bio-based and/or recycled plastics. Some of these applications help create benchmarks against which to predict what might be possible in the future, while others are dead ends that offer few environmental benefits over the use of conventional plastics. In most cases, it is too early to tell which kinds of bio-based/recycled applications will be economically feasible over the long term. Factors such as fossil fuel prices, environmental regulations, or simply consumer tastes will determine the future, but are hard to predict.

This chapter will strive mainly to discover the factors that determine which environmentally sustainable plastics applications are themselves truly sustainable and important, and which are not.

### 4.1 Trends in Sustainable Plastics Applications

From 2000–2010, bio-based and recycled-content plastics reached a phase of commercialization that has allowed their wider use in various common applications, most of which have traditionally used fossil fuel-based virgin resins. Now, more grocery stores carry transparent salad trays or egg cartons labeled as being made from PLA or as having post-consumer PET content. Some snack-food bags are also being made from PLA, replacing polyolefins. The polyurethane foam in some car seating is now partially based on soy-based resin. And more decking, fencing, or park benches are being made from post-consumer plastics used in wood-plastic composites.

[Sectors and trends covered in this chapter include general trends in plastics, packaging applications for bio-based and recycled plastics, sustainable plastics in building and construction, automotive plastics, and specialized plastics applications.]

These types of applications and material developments are overcoming some obstacles that have limited the sustainable

uses of plastics. Plastics are indeed often difficult to separate from used products for recycling. They are then hard to reuse in products with challenging property requirements. And many engineering plastics with complex chemistries usually cannot be bio-based or made from biopolymers. The above developments have attacked these challenges, but the developments also give rise to general, abstract questions, such as:

- How much does a partially bio-based plastic count as a sustainable product?
- How much food crop production should be devoted to making bio-based plastics?
- When does it make economic sense to recover postconsumer plastics from certain products?
- How much can we ever truly “close the loop” for plastics, and use post-consumer plastics in their original or more rigorous applications?
- And when do the valuable weight- or resource- savings qualities of plastic products compensate enough for the impacts of the resources used in their production, or difficulties with their recycling or disposal?

### 4.2 Sustainable Plastics Packaging

Over the past few decades, plastics have won a greater share of packaging applications as primary packaging for all kinds of products, especially food and beverages. Packaging is the largest end-use sector for plastics, and plastics now make up about 35% of all packaging materials in a growing global packaging market worth about \$430 billion in 2009. The percentage will likely get higher; after all, glass packaging is easily damaged and heavy; paper fiber materials lack transparency and water resistance, and metal packaging has aesthetics, damage, and weight issues as well. Moreover, all three of these categories of materials are energy intensive to produce. In contrast, commodity plastics packaging is lightweight, impact-resistant, and water- or gas-impermeable in the various degrees required – plus it can be transparent, tinted, or opaquely colored, with bright, glossy surface aesthetics. These qualities have contributed to plastics’ steep rise in packaging. But the plastics industry has also faced an equal amount of increasing complaints about the waste stream created by single-use plastics packaging. Critics point out that products are often over-packaged, and require consumers to dispose of this excess material if the plastic cannot be accepted for recycling.

In their desire to reduce costs, plastics packaging manufacturers already are pursuing one key aspect of sustainability: using less material, while still fulfilling the same packaging requirements.

Designing packaging with thinner dimensions (a topic covered more in Chapter 5) comes naturally to the industry. For example Nestlé's PET water bottles have become increasingly thinner and lighter over the years, being reduced in weight by 40% over a ten-year period. Computer-controlled process equipment has allowed these major reductions in material use. However, designers will eventually encounter a natural limit to how thin packaging material can be for an application before its products are no longer adequately protected, or the consumer interprets the packaging as being too flimsy.

#### **4.3 Sustainable Plastics in Building & Construction**

As the second largest end-use sector for plastics (consuming around 18% of all plastics used), building and construction applications consume a large variety of plastic types and forms. Plastics are used in construction in nearly the exact opposite way as how they are used in the packaging sector, in that:

- construction plastics are meant for long-term use, rather than relatively brief, disposable uses;
- construction applications are often bulky and space consuming rather than small, lightweight, and portable;
- unlike packaging, many construction plastics uses are not visible to the consumer because they are hidden behind walls or buried underground, as in wire and cable coverings and piping; and
- plastic construction products are invisible in another way – they are often intended to mimic other materials such as wood or stone, drawing attention away from the fact that they are plastic.

This last point perhaps is not surprising, because still in the minds of most people are positive associations about the look and feel of wood in a dwelling or office environment – a warmth, comfort, and natural texture that until only relatively recently plastics have been unable to emulate. Appropriately for construction and building applications, the “bio” content of plastics has mostly to do with the use of real wood fillers that help plastic composites mimic the density and textures of solid wood. The bulky, high-volume nature of many construction applications also serves as a high volume end-use for recycled plastic from packaging applications.

Driving some of these trends is increasing interest in “green building” – following guidelines which specify the use of more materials with recycled or renewable content, or the use of parts that reduce energy use in buildings. For example, the US EPA's Environmentally Preferable Purchasing Program specifies that buyers purchase construction materials with minimum bio-based or recycled content, such as:

- plastic lumber composite panels with 23% minimum bio-based content;
- plastic shower and restroom dividers and partitions with at least 20% post-consumer recovered material;
- non-pressure PVC pipes containing at least 25% recovered PVC overall, and 5–15% post-consumer content;
- and plastic floor tiles containing 90–100% recovered plastic.

Fortunes may even be turning for certain previously discouraged uses of plastics in construction. For example, the original LEED rating system in 2000 rewarded builders for avoiding using PVC in new buildings. Since then, the USGBC itself presented a study that analyzed the total environmental and health impacts of PVC in four construction product groups. The study determined that, except in the case of resilient flooring, PVC may still be a better or acceptable choice for siding, window frames, and drain/waste/ vent pipes.

##### **4.3.1 Recycled/Recyclable Construction Applications**

Recently, at least one waste building product has received more positive attention for both its economical use and source of recycled plastic: old carpeting. In the United States, a combined effort by various cooperating companies has demonstrated how old carpeting can be collected and recycled at high volumes. The partnership, called Carpet America Recovery Effort (CARE), was started in 2002 as an industry network of several dozen companies working together to redirect old carpeting away from landfills and into new recycling facilities. Old carpets are normally landfilled because there has never been an economical collection and reclamation infrastructure. Thus over 2 billion kg of carpeting are landfilled in the United States each year, roughly half of which is recoverable, valuable, nylon face fiber. The other half of a carpet's composition is polypropylene backing and calcium carbonate-filled latex that holds the fibers in the carpet – these materials can also be recovered.

#### **4.4 Automotive Plastics and Sustainability**

Compared with building and construction, automotive uses of plastics put their diverse aesthetics and engineering properties on much more obvious display. Over a hundred kilograms of various plastics are now used in the average vehicle – from decorative interior plastics to structural engine components. Nearly all the basic families of polymers are represented in various automotive uses, making it the most diverse plastic consuming sector.

##### **4.4.1 Fuel-saving Contributions of Plastics**

Despite their limited recycling, automotive plastics do serve a major role in overall sustainability – they make vehicles lighter,

improving their fuel efficiency and thus reducing greenhouse gas emissions and fossil fuel use. In a vehicle, a 10% reduction in vehicle mass – from the use of plastics, fiber composites, magnesium, aluminum, and high-strength steel – increases fuel economy by 6–8%. Moreover, every mass reduction has a “de-compounding” effect, meaning that a lighter car requires a smaller and lighter engine and a lighter structure.]. Thus, this effect can lighten the overall vehicle by roughly twice the amount of mass that was removed from just one car component (as long as new features are not added to the car that offset or even cancel out the mass reduction!).

#### 4.5 Specialized Applications and Plastics Sustainability

The three application areas above – packaging, construction, and automotive – show the wide range of ways in which plastics are used, and in which their sustainability is being tested. But the few smaller-volume application sectors covered below have particularly interesting sustainability issues of their own. Some of these specialized applications are inherently incompatible to recycling, recycled material content, or bio-based content; others are not, or have not had their life-cycle impacts sufficiently studied to determine sustainable options.

##### 4.5.1 Electrical/Electronics Applications

Plastics used in consumer electronics seem to be mostly invisible to consumers, who are now easily distracted by the increasing functionality of smart phones, portable computers, and similar devices. But most of these devices are housed in plastic that must be durable over a lifetime of use (which now may be only a few years or less, before the “old” device is disposed of and replaced with newer technology).

However, recycling operations for electronics expose workers and the environment to potentially hazardous materials. For example, electronic device materials often contain halogen-based flame retardants which have questionable health effects and are persistent in the environment. Recycling operations in developing countries have been found to be particularly lacking in proper controls for worker protection.

##### 4.5.2 Medical Plastics and Packaging

Plastic applications in the medical and healthcare arena range from packaging that is similar in nature to food and beverage packaging to devices used inside the human body, and from electronic equipment housings to various textiles and accessories unique to hospitals and clinics. Pharmaceutical containers, syringes, intravenous (IV) bags, and trays, most of which must be sterilized, are just a few examples of medical plastics uses which are consuming plastics at a steadily increasing rate.

As anyone who has visited a modern hospital already knows, most medical products are for one-time-use applications. This seems to be true especially for plastic products, which often end up being sent to hospital incinerators or other permanent disposal routes, rather than being recycled. Contamination from medication and bodily fluids means that significant purification steps would be required during recycling operations for medical plastic waste streams. And as with all medical applications, products containing recycle or based on renewable resources would need absolutely perfect traceability to verify the purity of their materials and processing. This is a challenge even when traditional virgin medical resin grades are used.

##### 4.5.3 Agricultural Applications

The general public mostly is unaware of the extent to which plastics are used in agricultural production. They are used not only for plant containers, but also for covering fields and as greenhouse films – holding in moisture, spurring young plant growth, and protecting growing crops from extreme conditions and pests. The sector consumes large quantities of the simplest commodity plastics (PE, PP, and PS) for products such as mulch and silage film, bale wrap and twine, landscape edging, plant trays and pots, and pesticide and fertilizer containers and bags. Unlike in medical applications, agricultural “ag” uses have more tolerance for material contamination and property variations – opening up the potential for recycling the plastics and using them again in a similar ag application, or for using plastics that readily biodegrade. |







## SPE PLASTIVAN™ PROGRAM

### ● COSTS OF SPONSORSHIP

The fee for the PlastiVan™ program is \$1500 a day. Your sponsorship covers travel & expenses for educators as well as all materials. SPE coordinates all scheduling and communication with schools. This allows more students greater access to the wonders of plastics in their own communities. Sponsorship of the PlastiVan™ Outreach Education Program is a tax-deductible donation.

### ● SPE PLASTIVAN™ SPONSORSHIP

With a national focus on STEM disciplines at all educational levels, both private and public resources are being marshalled to address a shortage of skilled employees across manufacturing industries. It is critical for plastics and related companies to be active in their communities, both to demonstrate career opportunities and to promote the benefits of plastics which are often misunderstood.

The PlastiVan™ Program is a great way to excite young people about the science and the vast opportunities the plastics industry has to offer. The program travels to schools and companies throughout North America, educating middle- and high-school students about plastics chemistry, history, processing, manufacturing, sustainability and applications. Corporate sponsors have a unique role to play in this community outreach program, linking the wonders of plastics to applications and jobs in the real world.



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# Surf's Up! Thai Company Launches Novel Plastic Offset Program

By Robert Grace

Starboard Co. Ltd., a maker of watersports products such as surf boards and stand-up paddle boards, has announced what it calls "the world's first Plastic Offset Program," or POP, for its own internal use and as an inspiration for others.

The Bangkok, Thailand-based company has created a fund to invest back into projects that remove plastic pollution to reduce the company's overall waste footprint. Its intention is to create a template that other companies can use to help quantify and counter the environmental impact of the plastics that they use in their products.

Bailey Rosen, a 21-year-old competitive paddle boarder and American sustainability analyst for the firm, revealed details of the project in an Oct. 31 presentation in Sydney, Australia, at the ninth international Plasticity Forum, a plastics sustainability conference.

Doug Woodring, Hong Kong-based founder of the Plasticity conference and vigorous clean-ocean advocate, said, "This is one of the most exciting stories to be announced on the topic of plastic pollution and offsetting use with programs that can recover, remove and improve on plastic waste reduction."



Starboard created its new offset program in coordination with the Plastic Disclosure Project and PDP's methodology for measuring a company's plastic footprint. The PDP is a voluntary initiative that asks organizations to do annual reporting regarding their production, use and handling of plastic and plastic waste.

PDP notes that such a baseline analysis is vital, because "if you don't measure it, you can't manage it." By having an accurate understanding of the amount of plastic that flows through an organization, it notes, efficiencies can be gained in cost reduction, wastage reduction, new design, new materials, and better recycling.

Founded in 1994, Starboard has created some of the world's leading windsurf and stand-up paddle boards. When it comes to the environment, the company said it strives to be part of the solution and not part of the problem, which led it to join forces with the Ocean Recovery Alliance and its Plastic Disclosure Project to help it understand its complete plastic use and waste footprint within the communities it serves.

Starboard exports its products to more than 70 countries, and has now calculated its use of plastics of every variety in boards, accessories, apparel, packaging, and operations for 2017 and projected forward for 2018. The PDP methodology allows a company to understand and quantify areas where recycled content, increased material recovery, or use of eco-innovation changes can be made in product lines to enable the reduction of its plastic footprint.





Rosen, who recently graduated with honors from the University of California, Los Angeles with a bachelor's degree in environmental studies, said the company calculated its plastics footprint to be roughly 320 tons per year. Over the past 12 months, she noted, it already has replaced more than 21 percent of the virgin plastic it typically would use with recycled plastic, while reducing its overall plastic consumption by 6.5 percent by using more bio-based materials. It

also changed how it paints its boards so that it uses less polyurethane spray. After calculating its "plastic footprint" in a manner similar to how companies calculate their carbon footprint, Starboard then "priced" its plastic use by assigning a financial value to the polymers used in production according to three different factors – duration of use, toxicity, and creation of waste.







"By accounting for these factors with an offset price, the Plastic Offset Program acknowledges the dynamic nature of the problems caused by plastics and further clarifies – and quantifies – the investment necessary to mitigate the impact of plastic used," the company said.

Starboard applied a price of 50 U.S. cents per kilogram to what it described as the least environmentally friendly plastic, meaning virgin material in a single-use application. Next was single-use recycled plastic, then multi-use virgin resin, multi-use recycled material, and finally, multi-use bio-based plastic.

"So," Rosen explained, "we valued this externality within our company, just as they do with carbon, but we're doing it with plastic. There's a complexity associated with that because not all plastics are created equal.

"The highest price on any material [Starboard uses] is the wrapping that goes around our boards — it's recycled HDPE/ LDPE mix, with about 10 percent waste, and we valued that at about 36 cents," she said, whereas some other injection molded components, made partially from recycled fishing nets and recycled industrial nylon, was factored in at only 2 cents per kilo.

Starboard contends that such a pricing scheme encourages companies to rethink and reinvent how they use plastic in an effort to reduce the external cost of the materials they

use. "Eliminating plastics from production, or switching to less harmful varieties (and thus with lower offset prices) will lead to a reduced investment in the Plastic Offset Program, incentivizing companies to re-engineer and reduce their plastic consumption habits," the firm said. Svein Rasmussen, Chief Innovator at Starboard, said: "We are excited to debut the world's first Plastic Offset Program. We have created a fund based off of plastic use in our products, which we will invest back into projects that protect the ocean – our greatest resource and big blue playground for paddlers and windsurfers worldwide."





Starboard's initial POP fund amounted to about US\$24,000, Rosen told 170 attendees at Plasticity Sydney and, echoing her boss, she noted it will be dedicated to "offsetting" its plastic use by removing and recycling ocean plastic. The company already has dedicated significant funds to research and development of natural materials such as balsa, which can replace thermoplastics like PVC, and has supported non-governmental organizations (NGOs) with larger funding to reduce plastic pollution impacts in waterways both in Bangkok and worldwide.

"We want to be as transparent about this as possible," Rosen stressed. "PDP will publish all this information, so other companies can understand what we did, and it can be replicated in the future. We want to set a good example. It's a voluntary initiative that demonstrates to the public and puts pressure on other companies to do it, and demonstrates to governments that this is an externality that needs to be valued...."

The POP, NGO support, environmental R&D, and advocating for legislation all fall under the umbrella of "Plastic Net Positive" – Starboard's aspirational goal to do more good for the plastic economy than they do harm. Through strategic use of funds, Starboard said it will not only "offset" its use of plastic, but also help better integrate plastics into the circular economy and mitigate their own impact on the planet. The company said it hopes to set an example not only for the watersports industry, but for all participants in the plastic economy.

"It is imperative," it stated, "that all stakeholders in the plastic economy recognize the unpaid costs of plastics – a toll that is taken on our environment and our health." Starboard and the Ocean Recovery Alliance encourage others not only to participate in the PDP to benchmark their plastic use, but to also price it via the POP.

Woodring, who also is co-founder and managing director of the Ocean Recovery Alliance, said, "Starboard Co. did an exceptional job to undertake the Plastic Disclosure Project's methodology, which is much like that of carbon and water reporting, in order to understand their plastic use, recycled content, recovery rates, and waste creation. We already know other companies that are interested in doing the same, much like carbon offsets, and now Starboard have set a standard for others to follow."

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