



Sustainability Newsletter

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In This Issue: Industry Round-Up

Plastics Sustainability by Mike Tolinski

Interview with Rick Wagner, Global Sustainability Manager

Chairman's Corner

Chris Surbrook, Midland Compounding & Consulting

We are offering this issue of the Sustainability Newsletter at ANTEC (May 8-10). This year the Sustainability Division has partnered with the Engineering Properties and Structure Division to provide papers at a joint session during ANTEC. This partnership was borne out of necessity because our Division lacks enough participation to staff a track ourselves. We had a total of 9 papers submitted, all of which will be presented at ANTEC by other divisions. We were also invited to participate at NextGen's "Pilot Our Future" event scheduled to be held at ANTEC from 4-5:30pm on Sunday, May 7. Unfortunately, we were not able to find anyone to represent Sustainability Division for this event. If you believe in our mission, we REALLY need your help to keep us alive as a SPE Division. Please contact our membership chair, Rick Wagner, at wagnerc@cpchem.com, to discuss opportunities to help support our division.

As our editor points out in his notes to our first article, we are delighted to offer members a special series of excerpts from Plastics Sustainability, written by the late Mike Tolinski, the former editor of Plastics Engineering. I first met Mike after one of his presentations at the GPEC in 2011, and we were able to collaborate on a couple of technical writing projects. Thank you, Conor, for making arrangements to share Mike's work with our members.

We are also introducing a series of interviews with sustainability professionals from around the plastics industry. This inaugural piece features a conversation with Rick Wagner, SPE Sustainability board member and Global Sustainability Manager at Chevron Phillips Chemical. We

encourage readers and members to offer suggestions or ideas for other interview candidates.

Our 2017 technical conferences are starting to happen. I am writing this letter from the 30th Annual ISRI Conference. This will be our third year providing speakers for this conference. The 2017 Re|Focus Sustainability & Recycling Summit follows quickly on the heels of ANTEC. The conference will be held in Orlando, FL again this year at the Rosen Shingle Creek Resort from June 26-28. There is a discount for SPE members. So, please plan to attend. I look forward to seeing you there. |



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Industry Round-Up

Notes and news from the world of recycling, bioplastics and sustainability in polymers

Sowing the seeds of successful ag plastics recovery

by **Colin Staub, Plastics Recycling Update**

April 19, 2017—A free service collecting LDPE films commonly used on farms kicked off in central Minnesota this week, the latest expansion for a growing ag-oriented project.

Revolution Plastics is the collection arm of Little Rock, Ark.-based Delta Plastics. It launched in June 2016 and has been steadily developing its base of farm customers. Over 3,000 sites are now a part of the program, Price Murphy, Revolution's director of operations, said in an interview. "We're collecting millions of pounds every month from Wisconsin and Minnesota farms," he added.

Delta Plastics manufactures poly tubing for irrigation, and it also specializes in the recovery and recycling of that tubing. The company has recycled ag plastics for more than 20 years, and it began investigating the collection end of the spectrum three years ago.

Delta was contacted by an agricultural industry representative who described a common situation on farms in southern Wisconsin: There were growing tonnages of used plastic, including a substantial amount of LDPE film from silage bags, bunker covers and barrel wraps. Together, those material types accounted for 55 million pounds of product sold in Wisconsin last year.

The material litters the grounds at dairy farms, beef farms, goat farms and other location. Farmers had few options to get rid of the materials when they were no longer useful.

"So they were either burning it on the farm or they were having to haul it to the landfill," Murphy said.

Delta Plastics' investment in the project has been in the millions of dollars, Murphy said, although he refrained from offering a specific number. The entire venture has been privately funded, he said.

"We're taking it one step at a time, focusing on one or two states at a time," Murphy said. "We'll continue to expand as the need is there.

Waste Management builds trash-sorting MRF near Oakland

by **Colin Staub, Plastics Recycling Update**

April 18, 2017—An operation in California estimated to cost more than \$120 million will extract plastics and other recoverable material from municipal solid waste. But it's not aimed at replacing curbside recycling collection.

"It does not replace, it does not promote, it is not an alternative to source separation," Shawn Tackitt of Waste Management told the board of the Alameda County Waste Management Authority (WMA) at a hearing in February. "We've been very clear about that. Source separation is our priority."

The organics materials recovery facility, or "O-MRF" as it's being called, is being built at the 53-acre Davis Street Transfer Station in San Leandro, Calif., a city adjacent to Oakland, Calif.

Waste Management, operator of the Davis Street Transfer Station, plans to begin operating the new equipment early next year. Waste Management, a publicly traded firm that is the largest U.S. recycling processor, is also planning composting and digesting facilities at the site.

According to project documents, the 62,000-square-foot sortation facility will be able to process 100 tons of municipal solid waste (MSW) per hour and will handle all 150,000 tons per year of MSW generated by Oakland.

It is projected to extract about 60,000 tons of organics and 31,000 tons of recyclables per year, which equates to diverting 61 percent of the garbage stream from landfill. Alameda County documents described the processing line as a "complex system of screens and optical sorting."

After separation, the recovered organics will be moved to the composting and digesting facilities adjacent to the O-MRF. Recovered recyclables, including plastics, glass

and metals, will be sent offsite to be recycled, according to project documents.

The composting facilities are planned to have a 1,000-ton-per-day capacity, and a maximum annual throughput of 205,000 tons. They are slated to begin operating in late 2018, according to the county's waste management plan.

Study: Labels impact PET bottle recyclability

By Jim Johnson, Plastics News

April 6, 2017—A new study says that while water bottles have become more environmentally friendly over the years through lightweighting, factors such as labels and glue still can greatly impact their recyclability.

Plastic Technologies Inc. of Holland, Ohio, is out with a new white paper after studying water bottles purchased in different parts of the world.

"The big takeaway is that the bottles are probably reaching the technical limit of what the light-weight bottle could handle, but at the same time, they could be better from a recycler's point of view," said Marcio Amazonas, one of three authors of the paper.

PET recycling can become contaminated by using the wrong label material or inks that bleed. Even the type of glue used can have an impact, said Amazonas, who authored the paper with Greg Fisher and Wei Zhang.

Water bottle designers have lowered the weight of their containers to 7.5 to 8.5 grams in some low-priced products, about one-third of the 22 to 23 grams still found in premium packaging tested by PTI.

But using labels, inks and glues incompatible with plastic recycling can have a big impact on sustainability, Amazonas said.

Paper labels, for example, can be more difficult to remove in the recycling process. And bits of paper fiber and glue that remain on PET after the separation process can burn and cause black marks when flake is later heated. Cheaper inks, which will bleed while in the water-based separation process, also can contaminate recycled flake and cause

discoloration of recycled plastic.

The paper indicated that five of seven bottle samples in the United States "will have some issue during the recycling process" when considering guidelines from the Association of Plastic Recyclers. The same was true for four of six bottles from Europe.

All label samples caused color and clarity change in the wash process, with label ink bleeding being most common. Soluble inks and glues, as well as label substrate compatibility with PET recycling, could improve recyclability, the paper states.

"Bottlers must look beyond the bottle itself and include components such as labels, inks and closures to truly understand their impact on the waste stream," the paper states.

Tons of plastic scrap could be auctioned in Hong Kong

by Recycling Today staff

April 11, 2017—CSPA reports some 5,000 containers backed up at Chinese border will be offered on auction to Southeast Asian buyers.

The Beijing-based China Scrap Plastics Association (CSPA) says some 5,000 sea containers loaded with plastic scrap may be auctioned off from their current position in Hong Kong. The containers from all over the world are loaded with plastic scrap and have not been able to enter the People's Republic of China since it began its National Sword inspection regimen.

In an 11 April 2017 email to its members, the CSPA says it is helping to prepare the estimated 5,000 "overdue" containers bearing plastic scrap to be "auctioned to potential buyers from Southeast Asia."

The CSPA says the containers have been stuck in a "stagnant" position at the port of Hong Kong ever since "the Customs [agency] of mainland China began checking every container that is to be cleared, which slows down the speed of clearance."

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Plastics Sustainability

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

[Editor's note: *This is the first 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.]*

Author's Note:

The overall argument of the book is not simple: it is not pro/con or for/against plastics in general, or pro-bioplastics, anti-traditional plastics. Given my background working inside the industry and with industry publications, readers might assume there could be a pro-plastics agenda embedded in the book. This is not the case. The book's essential argument is that with careful thought about multiple issues, optimally sustainable decisions can be made about the use of industrial materials such as plastics. However, decisions about what a sustainable use of plastics is will never be perfect, obvious, or self-evident – after all, even the definition of sustainability is difficult to pin down. The best decision-making process will consider multiple factors before settling on the best practical choice of material for a specific application in terms of environmental sustainability and public acceptance.

Chapter 1: General Introduction

This introductory chapter will address fundamental, current questions of interest related to plastics and sustainability. It will briefly introduce issues that are covered later in the book in more detail, also linking some well-known plastics controversies with the broader context of this book.

What is Environmental Sustainability?

In its most common use, the term sustainability is used as a shorthand term for environmental sustainability, which concerns human interactions with nature and technology. Often, sustainability simply relates the use of renewable, natural materials to the use of extracted, refined materials – usually favoring the former over the latter. Many non-industrial cultures, such as traditional Native American

cultures, have practiced environmental sustainability as a normal, fundamental driver of their social practices. And any brief tour of a history museum reveals how ingenious pre-industrial societies of only two hundred years ago were in their use of natural materials such as plant and animal fibers, wood, stone, and bone.

Sustainability is now often defined as a goal, such as the goal of using technology and resources to “meet our current needs without preventing future generations from meeting their needs.” The concept of sustainability is often commingled with issues about the health effects or damage to natural processes from the use of certain products or materials. Here, it is easier to identify what is unsustainable than to define what is sustainable. Any product that potentially has negative effects on human (or animal or plant) health, or that accumulates as waste in the environment, could also be thought of as unsustainable. Or, sustainability is often tied to the issue of global climate change and energy use, accompanying arguments that current rates of greenhouse gas production and fossil fuel use are unsustainable.

Thus many people have many views about sustainability. Since success in sustainable manufacturing and marketing depends on having friendly, accessible markets and consumers, this book will take a broad view of sustainability, based on how it is widely defined by or thought of by experts and the public, rather than limit its definition in an academic or industry-preferred way.

Narrowing our scope to plastics, but otherwise still keeping a broad view of the issue, there are many arguments to be offered in favor of or against their sustainability. The arguments involve the real or theorized large-scale environmental impacts related to the fossil fuels on which most plastics are based. These fossil fuel reserves are dwindling or becoming harder to extract, resulting in higher prices and economic disruptions that eventually will result from the unrestrained consumption of nonrenewable resources. There is also damage anticipated from the global warming caused by greenhouse gas emissions, effects which are linked to the fossil-fuel-based economic infrastructure that keeps plastics cheap and disposable. And there are issues of waste and litter that the public is

now more aware of, such as the Pacific Ocean “garbage patch” – a gyre composed of floating waste plastic and other products that has been reported on in recent years.

Facing the Contradictions of Plastics

An honest assessment of plastics as being useful, important materials also requires admitting that plastic products’ shapes, forms, compositions, uses, and material qualities are somewhat enigmatic or contradictory. Plastic products sometimes resemble objects from nature, although sometimes an alien, even science fiction form of nature. But normally they are not considered as being like anything that is natural; after all, plastic compositions are created by chemists and are mysterious to those uneducated in organic chemistry.

The term “plastics” is itself inadequate and misleading in that it refers to a wide range of materials. Some plastics are rubbery and some do not melt when heated; some are strengthened with glass fiber to become composites, while others are used in the form of simple films or foams. Certain plastic products are weak, cheap, and disposable; others are strong and durable – yet all are labeled simply as plastic.

At least one of these contradictions is directly focused on in this book: the use of valuable fossil fuels to create low-cost plastics. This is generally the case, though slowly in recent years, the existence of plastics is becoming less dependent on supplies of fossil fuels. More plastics are being made from renewable, biological sources. The growth rate of bio-based plastics is estimated to be 15–20% in 2011, and this growth is expected to continue at multiple times the rate of all plastics growth for the long term (with estimates varying from 12–40% annually).ⁱ

Plastics at Play in Consumer Lifestyles

Another plastics contradiction concerns consumers both in developed countries and, increasingly, in developing countries: Consumers have become incredibly dependent on plastic materials, even without understanding many of the details of their composition or how they are manufactured. Thus, ignorance, indifference, hostility, or ambivalence might be better terms for describing consumers’ views of plastics today. These views have resulted in the easy demonization of certain forms of plastics, with a complete obliviousness about other

potential problems associated with the ways we use all materials in industrialized society – metals, wood, and minerals, as well as plastics. Humans have consumed more of all these materials in the past 50 years than in all previous years combined – at increasing rates. And the vast majority of industrial materials are not based on naturally renewing resources, unlike in 1900, when over 40% of all materials used in the United States were based on forestry, agriculture, or other renewable industriesⁱⁱ. These trends, coupled with incredible population growth, have definitely stressed the environment.

Consider the ubiquity or “everywhereness” of plastics by looking at a day in the life of an adult in an industrialized country. When she wakes up, the first thing she touches is probably plastic: an alarm clock. Walking across the (nylon) carpet to the bathroom, brushing her teeth, washing her hair, and using other personal care items, she encounters a variety of plastics. The clothing she dresses herself in likely contains some polyester or another synthetic fiber. Her juice bottle and cup is plastic, as is her coffeemaker. She wraps her lunch in a plastic film or bag and places it in a reusable polymer-fiber sack. She drives to work in a car whose interior is almost completely covered in various polymer-based materials. She uses a coded plastic ID card to get into her workplace, grabs a (PET) bottle of water from the office refrigerator, and sits in front of a plastic-enclosed computer to spend the day tapping on plastic keys.

Consumer Interest in Sustainability

Consumers are interested in environmental sustainability, though their behaviors may not reflect their interest. In one recent survey, over 80% of consumers expressed concern about the environmental impact of their choices, and said they thought retailers’ environmental efforts are importantⁱⁱⁱ. But fewer than 10% would sacrifice convenience to buy sustainable products. And for many, the term “sustainable” itself has little meaning, or the meaning is unclear^{iv}. Most people feel recyclability is important, though in general consumers do not display diligence in their green behaviors overall, especially behaviors related to plastics. For example, consider the following:

- their rampant littering, which clutters the sides of roads, clogs waterways, and mars natural scenery (and here plastics make up a minor but very noticeable proportion of

littered materials);

- their inclination to throw easily recycled bottles into garbage cans rather than recycling bins;
- their favoring of factory-made products that are heavily packaged with plastics and other materials; and
- their constant replacement and disposal of electronic devices and media, most of which are encased in plastics,

to cite just a few observations. These real-world tendencies might not change much, and plastics producers and designers interested in sustainability must design around them as much as possible to “pollution proof” devices and packaging, and to make their recycling as easy as possible.

Sustainability: Views & Counterviews

Generally, this interest in “being green” makes sense; it can be assumed that everyone, theoretically at least, wants environmental sustainability. People want a clean, habitable earth with healthy places to live in, plus healthy wildlife in natural areas and oceans. However, the specific issues that determine or affect sustainability have less unanimous consensus. With plastics and other consumer materials, opinions (informed and otherwise) likewise range from the simple to the complex. As we have seen with the controversies described above, educated people, though they use plastics every day, commonly have a fundamental notion that plastics are bad for environmental sustainability, except when plastic products are made from natural materials or recycled plastics.

[In the next issue: **The Lifecycle of Plastics**]

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Industry Round-Up continued

The organisation also says China Customs, in many cases, “has not ascertained whether many types of these goods can be allowed to enter, and some of them are surely prohibited from entering into China’s mainland.”

Further adding to the delays, CSPA says, “China Customs has been scrutinizing licenses for plastic scrap in case the licenses are borrowed or sold illegally.”

In most cases, the owners of the containers “haven’t found channels through which their goods can be transported to other countries and areas.” Although many shippers and receivers have taken a “watch and wait” position, “hoping the restrictions will gradually be relaxed,” CSPA says, “there is no sign of improvement yet.”

CSPA says the “Global Auction of 5,000 containers in Hong Kong” initiative will be launched both online and at the ChinaReplas 2017 Exhibition, taking place 11-12 May 2017 in Dongguan, China. At the May event, “We are going to arrange a special session for auctioning these Hong Kong containers, by which owners can trade with buyers face-to-face,” CSPA says. “We hope that owners will be able to find suitable buyers via the efforts of our association.” |



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Interview with Rick Wagner, Global Sustainability Manager at Chevron Phillips Chemical Company LP

Conor Carlin: Let's start by getting a sense of how you became GSM at Chevron Phillips Chemical.

Rick Wagner: Chevron Phillips Chemical's sustainability journey started at its inception as a joint venture between two companies with long histories of commitment toward safety and environmental risk reduction, strong ties to the communities surrounding their operations and a drive toward continuous improvement. Since the company had strong successful programs in place, it needed someone who had participated in various areas of the business to be able to translate all of our practices through the lens of sustainability. I was selected for my work in refining, specialty polymer product development, application development and sales.

Carlin: Sustainability can be a very broad area that encompasses recycling, waste management, resource efficiency, carbon accounting and more. How do you see the plastics industry responding to the challenges of sustainability?

Wagner: Sustainability is a journey of progress and change. Materials like wood, tin, steel and aluminum took time for smart production, usage, re-usage and renewal of use for society to gain the true value of the materials. From the perspective of human history, plastics are still relatively new. The plastics industry has accepted this challenge and is looking at new ways to improve in these same areas with material suppliers, converters, packagers, brand owners, retailers, recyclers and equipment manufacturers all working together to improve the sustainable capabilities of plastics.

Carlin: Many studies over the past 15 years show that

companies who are committed to sustainable business practices outperform peer companies who do not. Talk about the business case for sustainability in the plastics industry.

Wagner: Manufacturing products safely, while using fewer materials to do so and continuing to improve performance is a winning combination in any book. But companies that can establish environmentally sustainable programs and then look beyond them to the sustainable aspects of its people, tend to have much greater success. Motivated employees standing behind a company's products will work together to ensure success. At Chevron Phillips Chemical, we believe this is achieved in part by creating an environment of diversity in the workplace with respect for all ideas, which promotes employee satisfaction and innovation.

Carlin: You're involved in several industry groups focused on recycling. What trends are you seeing?

Wagner: Recycling rates for common plastic materials such as polyethylene, polypropylene, PET and others continue to climb. Additionally, brand owners and retailers are taking on the challenge to design products and packaging with recyclability in mind where it makes sense. Interestingly though, while consumers prefer to buy recyclable products, they do not prefer buying materials that contain partially recycled materials. This is because many believe that products made with recycled content are lower in quality, even though in some cases it may actually be better than their counterparts due to higher attention to detail and design. This is a trend that must evolve for the value of plastics and partially recycled products to be accepted as a preferential material by consumers. |

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



SUSTAINABILITY

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The Executive Team took office on July 1, 2016.

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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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