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Circular economic efforts surrounding electronics waste



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Underfoot and overhead: Increasing use of recycled tires

by MAURA KELLER

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Much attention has been paid to the increased amount of recycling of household goods – paper, aluminum and plastic – most of which can be attributed to the growth of consumers working from home during the pandemic. And while consumers may be driving less these days, their tires are still wearing out and being recycled. According to the U.S. Tire Manufacturer’s Association (USTMA) (formerly known as the Rubber Manufacturers Association), the current tire recycling rate in the U.S. is 81 percent, up from 11 percent when the Association first began its scrap tire program. Internationally, Europe is boasting a 92 percent recycling and energy recovery rate of end-of-life tires, according to the European Tyre & Rubber Manufacturer’s Association (ETRMA). In response to Europe’s achievement, the USTMA is challenging the recycling industry to achieve a 100 percent end-use rate for scrap tires in order to improve the country’s sustainable circular end-end markets for tires. One way to do this is to increase the use of recycled tires in such applications as road construction and roofing.

According to John Sheerin, director, end-of-life tire programs at U.S. Tire Manufacturers Association, tires have been used in pavement surfaces since Charles MacDonald invented rubber modified asphalt in the 1960s in Arizona. Since then the technology to add crumb rubber into asphalt has progressed significantly with several processes becoming standardized.

“In California, rubber modified asphalt is the CalTrans pavement of choice, and USTMA saw a 50 percent increase in rubber modified asphalt from 2017 to 2019,” Sheerin said. “Rubber modified asphalt is less susceptible to rutting and cracking and is more durable than standard asphalt. As Departments of Transportation adjust pavement standards to account for rubber modifier we expect more lane miles of pavement will be rubber modified asphalt surfaced.” In fact recently, a United Kingdom-based firm called Tarmac Holdings Ltd. announced it developed a type of rubberized asphalt that uses about 750 tires for every 3,200 feet of roadway.

The American Society for Testing and Materials (ASTM) defines asphalt rubber as a blend of hot paving grade asphalt cement, reclaimed tire rubber and additives in which the rubber content is at least 15 percent by weight of



Including recycled rubber in asphalt increases pavement life by lessening brittleness and cracking. It reduces pavement noise and hydroplaning.

the liquid asphalt binder and has reacted to cause swelling of the rubber particles.

According to the Asphalt Institute, asphalt binders modified with ground tire rubber (GTR) can contribute to improved rutting resistance, skid resistance, ride quality, pavement life and reduced pavement noise levels. Adding rubber to the asphalt liquid slows the aging and oxidation of the resulting binder, which increases pavement life by lessening brittleness and cracking. Rubber-modified asphalt binders can be used in open-graded asphalt mixtures, which have reduced hydroplaning, vehicle spray and reduced pavement noise.

“Tire derived aggregate has also been used in road construction as lightweight fill over unstable soils, in retaining wall backfill, in landslide stabilization and as drainage media in stormwater infiltration galleries,” Sheerin said. “Stormwater infiltration galleries are proven to clean stormwater.”

Michael Lowe, chief executive officer of carpassionate.com is also seeing

an increase in recycled tires being used commonly in repairing damaged roads. As Lowe explained, rubber is first cut into small shreds, then burned so that it can be filled into potholes alongside with tarmac.

“This is more durable as it can hold more weight than tarmac by itself and is more durable in hot conditions, therefore becoming increasingly useful in areas such as Florida and California,” Lowe said. “I believe that it will become the main part of creating roads in the future, with more research and development being put into rubber and its use on our roads.

And while the use of tires underfoot on roadways and in crumb rubber applications in sports arenas and playgrounds continues to grow quickly, roofing is not as common a use of tire derived material but it is a growing application.

According to Sheerin, many contemporary roofing systems are now incorporating crumb rubber made from tires in a variety of products used in

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Mattress Recycling Council's success in California continues

According to the Mattress Recycling Council (MRC)'s latest report to state officials, more than 83 percent of mattresses discarded in the state in 2019 were diverted from California landfills, up 3 percentage points from the previous year.

This achievement is a testament to the ongoing success of the statewide mattress recycling program known to consumers as Bye Bye Mattress. Since launching in 2016, MRC has increased the number of units collected, pounds of material recycled and percentage of the population with access to the program.

Other accomplishments noted in the report further demonstrate the effectiveness of the program, including MRC's collaborative efforts to combat illegal dumping and investments in research to improve the recycling process and develop new markets for reclaimed component materials.

"There's been significant challenges facing the recycling industry, yet the Mattress Recycling Council continues to operate a program that improves year-over-year," according to managing director Mike O'Donnell. "We are always moving forward, increasing efficiency, incubating innovation, growing our network and finding ways to support a more sustainable environment."

In 2019, MRC focused its collection network expansion on rural counties; areas of the state experiencing high per capita rates of illegal dump-

ing; and communities disproportionately vulnerable to pollution. As a result, MRC added additional no-cost collection sites, collection events and municipal curbside bulky item collection programs, while also expanding access to the program for mattress retailers to more easily recycle old units collected from their customers. Overall, residential access increased from 92.7 percent to 94.8 percent, with higher gains in rural counties (78.5 percent to 85.8 percent) and environmental justice communities (95.3 percent to 98.5 percent). By the end of 2019, every county in the state had access to the program through at least one collection site or collection event.

"Coordinating with mattress retailers and the existing solid waste infrastructure throughout California has been a monumental achievement for the program," said O'Donnell. "We've augmented that network by collaborating with nonprofit partners, including Local Conservation Corps, Goodwill Industries and Habitat for Humanity, so that access to the program is provided no matter where you live."

MRC's footprint of over 200 collection sites, 150 collection events and 50 curbside bulky item collection programs, combined with retailers taking back used units from customers when new ones are delivered, enabled MRC to collect more than 1.4 million mattresses for recycling in California in 2019, diverting 58.3 million pounds of material from state landfills.

Aircraft recycling companies merge efforts

North American Aerospace Industries (NAAI, Kinston, North Carolina), a provider of sustainable end-to-end aircraft recycling, has merged with Aircraft Interior Recycling Association (AIRA, Sheffield, South Yorkshire, UK), a total aircraft interior support company. While the news is formidable for both organizations, it also offers new opportunities for airlines, aircraft owners and OEMs to generate new revenue streams, gain savings, reduce their carbon footprints, and help address critical social needs; all of which have become more important in today's post-pandemic period.

According to Sven Daniel Koechler, PhD, president and chief executive officer of NAAI, "AIRA is the only aircraft interior recycling company that has developed the scientific expertise and technical know how to properly recycle end of life aircraft interiors and waste materials from manufacturing. Since our top priority is to provide sustainable aircraft recycling services through which 100 percent of an aircraft is recycled or upcycled, gaining the ability to effectively address one of the most challenging aspects of an aircraft's recycling – its composite plastic interior components – is a major achievement for us. We are very proud of our new alignment with AIRA. Together, we intend to revolutionize aircraft recycling, transforming it into an industry which delivers enormous benefit across the entire chain, from OEMs, MROs, airlines and leasing companies to the general public and the environment."

Through their merged organizations, NAAI and AIRA will help its customers gain the maximum return on their aircraft investment by recycling interior components often neglected due to the complexities involved in identifying composite materials. With AIRA's unmatched expertise in this area, the companies will be able to help their customers capitalize on these materials by returning them to the supply chain for use in producing other products.

"The pandemic has had a devastating impact on the aviation industry and many other industries, causing wide-scale job losses and leaving many people in severe economic distress," added Koechler. "Even before the pandemic, many people across the world were living in poverty. Through more sustainable aircraft recycling practices, we help them achieve a better quality of life and protect our environment by reducing aircraft waste in landfills and aircraft boneyards."

NAAI is building one of the world's largest hangar systems in North Carolina. The three part hangar system will house a 357,000 sq.ft. dismantling shop; 151,800 sq.ft. MRO facility; and 102,000 sq.ft. paint shop for narrow and wide body aircraft. Its proprietary processes will enable the company to recycle multiple aircrafts simultaneously for a much faster recycling process. The NAAI facilities will also encompass an 80,800 sq.ft. space designated for storage and offices. Koechler is projecting that the facility will be operational by late 2021.

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Republic Services, Aria Energy and BP partner on renewable energy project

Republic Services and energy partners Aria Energy and BP announced the startup of a landfill gas to renewable-natural-gas (RNG) project at South Shelby Landfill in Tennessee. The project directly supports Republic's commitment to send 50 percent more landfill gas to beneficial reuse by 2030.

South Shelby Landfill is one of 189 active, modern day landfills managed by Republic Services, the second-largest recycling and waste services provider in the country. Aria operates the project, processing and purifying biogas from the landfill into RNG. BP will transport the RNG into the interstate natural gas pipeline grid and market it to renewable energy customers. This is Aria and BP's fourth RNG project at a Republic Services landfill.

"The South Shelby RNG project upholds our ongoing commitment to converting low carbon fuel sources like landfill gas into clean, useful renewable energy for vehicles, homes and businesses," said Richard DiGia, Aria Energy president and chief executive officer.

With a production capacity of 4,000 MMBtu per day, the South

Shelby RNG facility can produce the equivalent of nearly 33,250 gallons of gasoline daily. Across the country, Republic is involved with 69 landfill gas projects.

"Renewable energy is a key element of Republic Services' long-term sustainability platform," said Pete Keller, Republic Services vice president of recycling and sustainability. "We are committed to sending 50 percent more biogas to beneficial reuse in the next 10 years, and projects like South Shelby Landfill will help us meet that goal."

Landfill gas, or biogas, is produced naturally as waste decomposes. The South Shelby RNG project processes the landfill gas into low-carbon RNG, which is an upgraded, methane-rich product that can be used to fuel natural gas vehicle fleets, such as Republic's collection trucks. Use of this low-carbon fuel results in approximately 50 percent lower greenhouse gas emissions than from equivalent gasoline or diesel fueled vehicles. The project and purchase of the RNG fuel support federal Renewable Fuel Standards.

MassBio expands partnership with Veolia for services

The Massachusetts Biotechnology Council (MassBio) announced an expanded partnership with Veolia North America for its savings and rewards program, MassBio Edge. Veolia will serve as the preferred partner for all streams of waste management. The company will be an all-inclusive resource for transportation, disposal, training, and regulatory guidance related to all types of hazardous, non-hazardous, regulated medical waste, and low-level radioactive materials, and will offer comprehensive recycling and waste to energy programs.

As a one-stop-shop for all MassBio members, Veolia provides a complete range of services for life sciences, biotechnology, universities, hospitals, industrial and municipal customers needing to dispose of their waste. With more than 45 sales, services, treatment and disposal facilities in the United States, the company provides a full array of capabilities and facilities conveniently located to most industrial facilities throughout the country. With a dedicated MassBio service team, Veolia is a leader in reconciling economic effectiveness and environmental performance, with strict adherence to safety and compliance rules.

By aggregating the purchasing power of the 1,300+ member companies within MassBio, members can save more than \$175 million each year.

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\$25,000 in grants provided for recycling, composting in Maine schools

Ecomaine announced its call for proposals for the organization's 2020-2021 round of recycling grants, which are designed to raise recycling awareness in schools and communities, and to help schools implement more efficient recycling programs or add composting to their waste collection.

As Maine's pioneer of single-sort recycling and provider of waste-to-energy solutions, ecomaine is pleased to announce that any school from its 70 member communities can apply for Recycling Grants through October 30, 2020.

"This year is obviously proving to be a tough one for all of us – especially schools and students," said Caleb Hemphill, Chair of ecomaine's Outreach & Recycling Committee. "It is ecomaine's hope that this funding can help maintain some of the important programming around recycling, compost,

and waste reduction that we've seen in our schools. We're looking forward to seeing some creative proposals in 2020-21."

Past grant proposals have ranged from purchasing in-school recycling bins or education materials to offsetting compost hauling fees, assisting schools to participate in tours of ecomaine, or purchasing electric hand driers to reduce paper towel waste. If selected, school recipients can receive up to \$5,000 of \$25,000 in available grant funds for the 2020-21 school year. Awardees are chosen based on the following criteria:

Following the October 30 deadline, proposals will be reviewed by ecomaine's Outreach & Recycling Committee, and recipients will be notified by mid-November.

For a direct link to additional information, view this article on www.AmericanRecycler.com.

USTMA board names new members

The U.S. Tire Manufacturers Association (USTMA) has elected two new members to the board of directors.

Kumho Tire's Yong-Sik Shin and Pirelli's Pietro Berardi were elected during the board's meeting. The board also extended the term of current board chair Steve McClellan, president, Americas, The Goodyear Tire & Rubber Company, through October 2021. McClellan became president of Goodyear's Americas business unit in 2016.

Yong-Sik Shin, president and chief executive officer of the American Busi-

ness Division, Kumho Tire, and Pietro Berardi, the current chairman and chief executive officer of Pirelli Tire North America was named to the board.

Since September 2019, Yong-Sik Shin has served as the president and chief executive officer of the American Business Division for Kumho Tire.

Before joining Pirelli in March, Pietro Berardi was the vice president for the Alliance (Nissan-Renault-Mitsubishi) managing the global commercial operations and strategy of the parts and services business.

Rubber usage

■Continued from Page 1

both residential and commercial applications. These products can satisfy established technical performance standards needed for each application: for example, those related to flammability and moisture/vapor transfer.

"Asphalt is a well-known waterproofing material," Sheerin said. "Adding recycled tire rubber enhances a roofing system's flexibility, flow characteristics, and fatigue resistance."

Another type of roofing product is water-based acrylic roofing systems (also referred to as infrastructural coating systems).

"Adding crumb rubber makes these products as durable and flexible as any conventional membrane," Sheerin said. Another type of roofing product is shake rubber roofing tiles, which are made from compression molded recycled tire crumb rubber. As Sheerin explained, these tiles keep houses cooler in summer and warmer in winter, and are maintenance free, fire resistant, immune to insects, resistant to rot, mildew and moss.

Overall, rubber shingle roofs offer a less expensive roofing option that is durable, eco-friendly and offer economical insulating capabilities.

The international growth of recycled tires use in road and roofing applications is the result of the benefits mentioned above. In addition, Sheerin pointed to the most important benefit being that recycled tire products perform as well or better than those made with virgin materials.

"Adding rubber to asphalt and roofing materials increases the durability and longevity of these materials," Sheerin said. "In roads there is less rutting and cracking while in roofing there tends to be more insulation value."

In addition to the proven benefit rubber provides to these products, identifying uses for scrap tires that are both sustainable and advance the circular economy provides many environmental and societal benefits.

"Utilizing scrap tires in sustainable, circular markets diverts tires from landfills and displaces the need for virgin materials," Sheerin said. "Additionally, diverting scrap tires from landfills and from scrap tire piles prevents fire and disease risk, as piles of scrap tires can create a fire hazard and can be a breeding ground for mosquitoes."

Road and roofing growth opportunities aside, Sheerin said the biggest issue in tire recycling is growing new and existing markets for scrap tires. New markets for scrap tires are not growing at the same rate as annual generation of scrap tires which means more tires are going to the landfill. "Additionally, this creates the potential for increased illegal dumping and for stockpiles to grow which again have associated fire and disease risks,"

Sheerin said. "As a result, we need to grow new and existing markets for scrap tires. To help drive progress, research is needed to assess the life cycle impacts of markets."

In terms of market trends, in the past few years the USTMA has seen a decrease in the use of tire derived fuel in utility and pulp and paper mill boilers caused by competition from natural gas.

"We have also seen an increase in the use of crumb rubber made from scrap tires in rubber modified asphalt," Sheerin said. "The use of crumb rubber made from scrap tires in rubber modified asphalt provides a sustainable and circular application for scrap tires. When asphalt reaches the end of its useful life it can be stripped up and reused as recycled asphalt pavement, continuing the benefits of the rubber in the road."

Of course, every application has its own unique challenges. As Sheerin stressed, it has taken decades of research to deliver rubber modified asphalt products that can reliably meet or beat virgin material alternatives.

"It also has taken a considerable amount of time and effort to demonstrate the benefits of using rubber modified asphalt in paving projects and for state DOTs to adjust their pavement standards to allow for the use of this technology," Sheerin said. "There is still more work to be done in this area in order to grow the use of rubber modified asphalt."

Further, the economic benefits of longer lasting roads are not fully accounted for in initial cost selection criteria. "Just as an LED light bulb may have an initial cost slightly higher than fluorescent or incandescent, its energy savings over time make it the lower cost alternative," Sheerin said. "Similarly, while there can be an increased cost to add crumb rubber from scrap tires into rubber modified asphalt, that cost is more than recouped over the extended performance of the products."

As the USTMA calls for increased recyclability of end-of-life tires, the organization hopes to see growth in existing and new markets for scrap tires that are sustainable and advance the circular economy. The organization sees a lot of potential for the use of scrap tires in applications such as rubber modified asphalt, stormwater infiltration galleries, stormwater retention, flexible porous pavements, molded and extruded products used in the automotive industry, recycled carbon black and other pyrolysis and devulcanization technologies.

"Tires are one of the most recycled and reclaimed consumer products on the market today," Sheerin said. "Our long-term vision is to see 100 percent of end of life tires going into sustainable, circular markets."

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Grants awarded for quality improvement of recyclables

Together, more than 100 Michigan communities are joining state, regional and national partners to combat recycling contamination and improve the capture of high quality recyclables across the Great Lakes State.

Partnering with the Michigan Department of Environment, Great Lakes and Energy (EGLE) and The Recycling Partnership, a national nonprofit dedicated to transforming recycling for good, as well as material recovery facilities (MRFs), haulers, and resource and solid waste management authorities, communities will develop and implement operational and educational strategies to improve the quality of their recycling streams, leading to cleaner recycling practices and a reduction in the amount of contaminated materials improperly going into recycling.

“We are looking forward to partnering with Michigan communities and The Recycling Partnership on this data-driven approach,” said Liz Browne, acting director of EGLE’s materials management division. “It’s more important than ever to communicate with the public in order to improve the quality of materials being recycled. We all have a role to play in helping businesses get materials to make the essential products Michigan needs for our economic recovery from COVID-19, such as toilet paper, food containers, and shipping boxes.”

In addition to building upon the success of Michigan’s national award-winning Know It Before You Throw It recycling education campaign, the communities will utilize The Partnership’s “Feet on the Street” cart tagging program

– a proven initiative to improve the quality of curbside recycling by providing residents personalized and real-time education and feedback.

“Our ‘Feet on the Street’ program works by giving Michigan residents instant feedback on what is and is not recyclable,” said Jill Martin, chief director of community programs at The Recycling Partnership. “Through this tailored feedback loop, we are helping Great Lakes State residents capture more quality recyclables that are then transformed into new materials, creating a healthier, more circular economy, a less wasteful planet, and stronger, healthier communities.”

Nationally, more than 70 communities representing 18 different states have implemented elements of The Recycling Partnership’s Feet on the Street program. Some communities have seen as much as a 57 percent decrease of nonrecyclables in recycling and average a 27 percent increase in the overall capture of quality recyclables.

Michigan communities utilizing drop-off recycling programs will benefit from improved signage and site improvements, increased participation and other opportunities to educate residents on what is and isn’t recyclable.

The anti-contamination projects began in summer 2020 and will continue through the end of 2021. The projects are made possible by an \$800,000 EGLE grant, allocated in 2019, awarded to 14 grantees representing more than 100 communities and 300,000 households across the Great Lakes State.

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1999 BARCLAY ROTO-SHRED TIRE SHREDDER

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METALS

Steel imports down 19 percent through July

U.S. IMPORTS OF FINISHED STEEL MILL PRODUCTS					
BY COUNTRY OF ORIGIN (Thousands of Net Tons)					
Preliminary	JUL 2020	JUN 2020	2020 (annualized)	2019 (12 months)	% Change 2020 Annual vs. 2019
SOUTH KOREA	158	187	2,197	2,576	-14.7%
JAPAN	50	61	830	1,242	-33.2%
GERMANY	46	79	724	1,043	-30.6%
TURKEY	52	29	642	328	95.9%
BRAZIL	88	23	639	534	19.7%
TAIWAN	37	65	636	830	-23.4%
CHINA	60	39	399	544	-26.7%
NETHERLANDS	42	34	393	550	-28.5%
All Others	834	803	10,700	13,405	-20.2%
TOTAL	1,367	1,320	17,160	21,051	-18.5%

Based on preliminary Census Bureau data, the American Iron and Steel Institute (AISI) reported that the U.S. imported a total of 2,690,000 net tons (NT) of steel in July 2020, including 1,367,000 net tons (NT) of finished steel (up 92.0 percent and 3.6 percent, respectively, vs. June final data). Through the first 7 months of 2020, total and finished steel imports are 15,088,000 and 10,010,000 net tons (NT), down 19.2 percent and 26.1 percent, respectively, vs. the same period in 2019.

Finished steel import market share was an estimated 20 percent in July and is estimated at 19 percent over the first seven months of 2020.

Key finished steel products with a significant increase in imports in July compared to June are reinforcing bars (up 61 percent), tin free steel (up 61 percent), heavy structural shapes (up 51 percent) and tin plate (up 43 percent).

In July, the largest volumes of finished steel imports from offshore were from South Korea (158,000 NT, down 15 percent from June final), Brazil (88,000 NT, up 286 percent) and China (60,000 NT, up 53 percent). For the first 7 months of 2020, the largest offshore suppliers were South Korea (1,282,000 NT, down 21 percent vs. 2019) and Japan (484,000 NT, down 40 percent).

Commerce department enhances steel import tracking system

The U.S. Department of Commerce announced the adoption of a final rule modernizing the Steel Import Monitoring and Analysis (SIMA) system. Commerce also announced plans to unveil a new online platform for SIMA on Commerce's website in October.

"These significant improvements to SIMA will enable Commerce and the public to more readily identify transshipment and circumvention involving steel imports," said U.S. secretary of Commerce Wilbur Ross. "This is one more way the Trump Administration is standing up for our workers and families across the country who depend on a strong American steel industry."

The regulatory changes adopted by the final rule will: (1) require steel import license applicants to identify not only the country of origin, but also the country where steel used in the manufacture of the imported product was melted and poured, as defined in the final rule; (2) expand the scope of steel products subject to the import licensing requirement to include all products subject to Section 232 tariffs; (3) extend the SIMA system indefinitely; and (4) codify the existing low-value license requirement for certain steel entries up to \$5,000. Commerce received public comments on these

regulatory changes, as published in a March 2020 proposed rule.

The new online platform for SIMA to be released on October 13, 2020, represents the first major overhaul of the system since it was last updated in 2005. The updated SIMA will offer free, modern data analytic tools to the public for performing detailed, customized data analysis. These tools will aid in the identification of changing trade patterns and surges in U.S. imports of steel products, as well as potential circumvention and evasion.

Commerce will hold a series of webinars for users to become familiar with the updated SIMA system. The webinars will be offered on a first-come, first-served basis.

For specific dates and times of the demonstrations, and for information about participating, please visit <https://www.trade.gov/updates-steel-import-licensing>.

The updates to SIMA are consistent with the May 17, 2019 joint understandings between the U.S. and Canada, and the U.S. and Mexico, which provided that in monitoring for steel import surges, the United States may treat products made with steel that is melted and poured in North America separately from products that are not.



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Commodity		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
#1 Bushelings	per gross ton	\$264.00	256.00	252.00	263.00	289.00
#1 Bundles	per gross ton	253.00	235.00	231.00	255.00	262.00
Plate and Structural	per gross ton	254.00	228.00	225.00	251.00	275.00
#1 & 2 Mixed Steel	per gross ton	176.00	220.00	219.00	248.00	265.00
Shredder Bundles (tin)	per gross ton	121.00	125.00	165.00	140.00	135.00
Crushed Auto Bodies	per gross ton	121.00	125.00	165.00	140.00	135.00
Steel Turnings	per gross ton	81.00	88.00	83.00	128.00	149.00
#1 Copper	per pound	2.77	2.45	2.69	3.02	2.76
#2 Copper	per pound	2.64	2.34	2.52	2.84	2.56
Aluminum Cans	per pound	.46	.49	.47	.50	.50
Auto Radiators	per pound	1.32	1.20	1.53	1.49	1.48
Aluminum Core Radiators	per pound	.49	.50	.40	.45	.53
Heater Cores	per pound	1.01	1.00	1.07	1.02	1.10
Stainless Steel	per pound	.47	.47	.51	.52	.51

All prices are expressed in USD. Printed as a reader service only.

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METALS

Novelis supplies aluminum for coffee packaging

Novelis Inc. has partnered with Nespresso, the pioneer of premium portioned coffee, to launch the first coffee capsule made of 80 percent recycled aluminum. The highly recycled, sustainable alloy is featured in Nespresso's new coffee capsules.

Novelis' alloy has industry leading deep drawing properties to meet the coffee capsule market's need for demanding product specifications. The alloy also supports Nespresso's continued circularity journey by minimizing waste and maximizing the reuse of product materials.

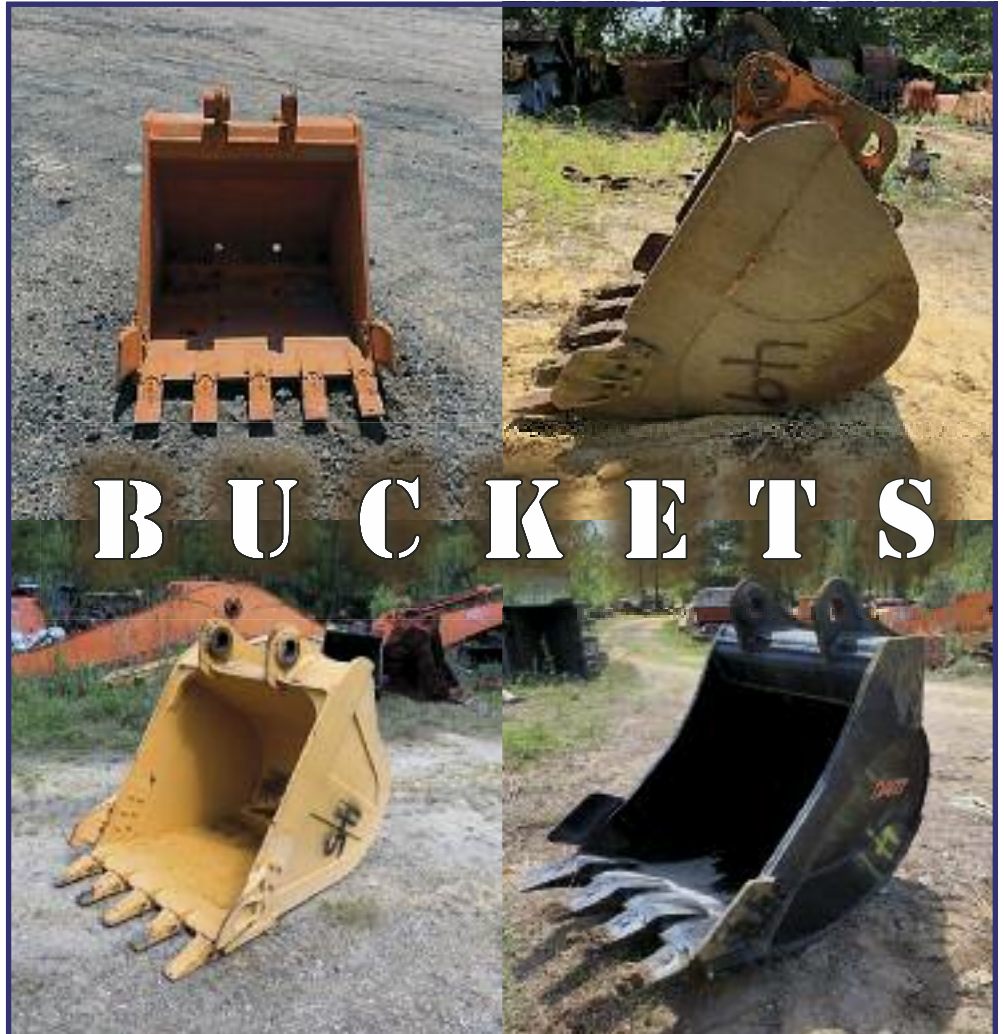
"This achievement is an important step in helping Nespresso reach its sustainability goals," said Stephen Boney, vice president, specialties, Novelis Europe. "We have a longstanding partnership with Nespresso that is focused on implementing more sustainable manufacturing processes throughout the supply chain. As such, we have increased the amount of recycled aluminum content in coffee capsules and developing additional end-of-life recycling solutions for greater circularity."

Comprised of a thinner aluminum foil, the new capsules contain 9.2 percent less aluminum material and are 8 percent lighter. The foil protects

freshness and aromas of high-quality coffee and provides a strong barrier against oxygen, light and humidity. More importantly, the foil is infinitely recyclable and requires less energy to produce than virgin aluminum.

Jérôme Pérez, Nespresso head of sustainability, stated, "We are constantly challenging ourselves to improve the sustainability and circularity of our operations, including the way we source, use, and recycle material. Reaching 80 percent recycled aluminum in our capsules is a significant milestone, and something we have worked hard to achieve along the value chain."

In recent years, Novelis has developed many new alloys that are easily recyclable and invested in technologically-advanced recycling facilities that have increased recycled product content from 33 percent to 60 percent across its global operations. To that end, the company is committed to maximizing aluminum's many positive benefits to create a fully circular economy that has more efficient, sustainable business models.



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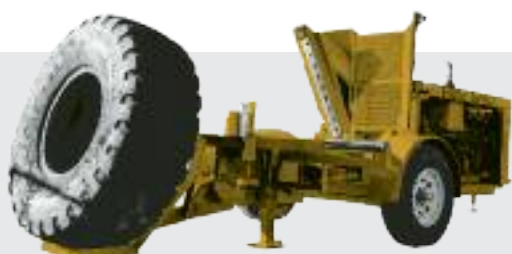
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AUTOMOTIVE

Fiat Chrysler Automobiles and All Auto Recalls partner to recover affected Takata airbag inflators

The mandatory recall notice issued by the Australian Competition and Consumer Commission (ACCC), requires all manufacturers to account for all Affected Takata Airbag Inflators (ATAIs) that were used in their vehicles by December 31, 2020.

Fiat Chrysler Automobiles (FCA) is committed to doing everything possible to locate every ATAI from the auto recycling industry. "Our partnership with All Auto Recalls is a critical component of this effort and commitment by FCA. We are proud to be working closely with the All Auto Recalls team who have already, in only a few days,

helped us account for more ATAIs than we've been able to locate in the past year", said Luis Gonzalez, products safety and recalls manager at FCA.

The relationship between the two organizations is such that All Auto Recalls will manage the retrieval of ATAIs on behalf of FCA from the salvage and auto recycling industry.

"We are working with over 300 recyclers across Australia on a day to day basis and have well in excess of 600,000 VINs under our recalls management platform. Vehicle manufacturers such as FCA recognize that All Auto Recalls offer significant value to

their endeavor to meet their obligations under the ACCC mandatory recall. In this specific case, we have enabled FCA to account for 5 times the amount of ATAIs than that which they had accounted for to date from the automotive recycling industry," said Chris Daglis, managing director of All Auto Recalls.

All Auto Recalls began their outreach program for FCA to all their recycler members and will continue to do so in the coming months. Chad Counselman, technical sales manager at All Auto Recalls said, "The response from our members has been excellent.

We have over one hundred Jeep, Dodge and Chrysler airbags already on their way back to our warehouse and more on their way. We are here to help the auto recyclers meet their obligations, work with them to put good recall practices within their businesses and make sure the parts they are selling are safe. We can guarantee vehicle manufacturers that are serious about accounting for as many of these ticking time bombs as possible, that engaging All Auto Recalls will deliver a better outcome than they would otherwise achieve. What we've done for FCA in just days, is proof of that."

Subaru partners with TerraCycle to recycle PPE

Subaru of America, Inc. announced a new recycling initiative to recycle personal protective equipment (PPE) waste in response to the increase in waste due to the COVID-19 pandemic. The new initiative is an expansion of the automaker's existing recycling collection partnership with TerraCycle®, the world's leader in the collection and repurposing of complex waste streams. The new collection efforts divert improperly discarded PPE from landfills and incinerators. Subaru will employ TerraCycle's Zero Waste Boxes™ to collect disposable

masks and gloves across more than 20 offices nationwide, including ports, regional training centers and the automaker's headquarters in Camden, New Jersey.

"At Subaru, our commitment to maintaining a safe work environment is as strong as our dedication to protecting and preserving our environment by keeping it clean," said Alan Bethke, senior vice president, marketing, Subaru of America, Inc. "This expansion of our work with TerraCycle allows us to responsibly wear PPE while furthering the Subaru Love Promise commitment

to reduce landfill trash and engage in smart environmental practices, simply because it is the right thing to do."

Zero Waste Boxes provide a convenient recycling solution for all types of single-use PPE, which are not recyclable through conventional recycling facilities. By placing Zero Waste Boxes in offices around the country, Subaru employees can responsibly dispose of their protective gear instead of tossing items on the ground.

To properly collect and recycle PPE waste, each participating Subaru corporate location will utilize the following Zero Waste Boxes:

- Disposable Gloves Zero Waste Box – to recycle vinyl, nitrile, and latex gloves.

- Disposable Masks Zero Waste Box – to recycle surgical and industrial face masks.

When full, the boxes will be returned to TerraCycle for processing and the collected waste will be cleaned, melted and remolded to make new products. Disposable masks are typically made from #5 polypropylene

plastic and can be turned into a variety of items ranging from reusable shipping pallets to plastic lumber applications. Rubberized disposable gloves can be used by rubber manufacturers in low-grade applications for products such as matting.

Through the Subaru Loves the Earth recycling program, created in partnership with TerraCycle, participating Subaru retailers nationwide use Zero Waste Boxes to encourage customers, employees and community partners to recycle waste streams that are commonly thought of as hard-to-recycle, including snack wrappers/bags, disposable cups, lids, plastic straws, as well as coffee and creamer capsules. In addition, Subaru encourages customers to further their personal commitments to sustainability by individually collecting these waste streams and bringing them to a local participating Subaru retailer.

To learn more about Subaru Loves the Earth and the environmental work Subaru does, visit subaru.com/earth and follow #SubaruLovesTheEarth.

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PLASTICS

Enforcement of NY bag ban to begin

New York State Department of Environmental Conservation (DEC) Commissioner Basil Seggos announced that DEC will begin enforcement of the state's ban on single-use plastic carryout bags on October 19, 2020. The plastic bag ban, which went into effect on March 1, was not enforced per an agreement between the parties in a lawsuit brought by Poly-Pak Industries, Inc., et al, in New York State Supreme Court.

DEC Commissioner Seggos said, "The Court's decision is a victory and a vindication of New York State's efforts to end the scourge of single-use plastic bags and a direct rebuke to the plastic bag manufacturers who tried to stop the law and DEC's regulations to implement it. As we have for many months, DEC is encouraging New Yorkers to make the switch to reusable bags whenever and wherever they shop and to use common-sense precautions to keep reusable bags clean. The Court has ruled and DEC will begin to enforce the ban on October 19th. It's time to BYOBAGNY."

Pursuant to an Order of the New York State Supreme Court, Albany County, DEC agreed to provide the parties and the Court at least 30 days' notice prior to commencing enforcement. DEC is currently conducting extensive outreach to stakeholders, including grocery stores, retailers, and others, to provide notice of the start of enforcement and answer questions.

DEC continues to encourage the use of reusable bags wherever and whenever they shop with the #BYOBAGNY campaign, launched earlier this year.

New Yorkers use an estimated 23 billion plastic bags annually – each for about 12 minutes – and approximately 85 percent ends up in landfills, recycling machines, waterways and streets.

PAPER

AF&PA updates paper reports

The American Forest & Paper Association released its August 2020 U.S. paper reports.

Containerboard

Total containerboard production in August remained essentially flat (+0.4 percent) compared to August 2019. It was up four percent when compared to the same eight months of 2019.

- August 2020 production of containerboard for export decreased nine percent compared to the same month last year; it was up 23 percent year-to-date.

- The containerboard operating rate was 92.1 percent, essentially flat (-0.4 pts.) from August 2019 and up 2.7 points year-to-date.

- Mill inventories of containerboard at the end of August increased 35,000 short tons from the previous month and were up 68,000 short tons compared to August 2019.

Printing-Writing Paper Report

Total printing-writing paper shipments decreased 24 percent in August compared to August 2019. U.S. purchases of total printing-writing papers decreased 24 percent in August compared to the same month last year. Total printing-writing paper inventory levels remained essentially flat (+0.3 percent) when compared to July 2020.

- U.S. purchases of uncoated free sheet (UFS) papers in August decreased 22 percent compared to last August while the inventory level increased one percent compared to July 2020. UFS imports and exports both decreased compared to July 2019, down 20 percent and 51 percent respectively.

Coated free sheet (CFS) paper shipments decreased 19 percent compared to August 2019 while the inventory level decreased one percent compared to July 2020. CFS imports and exports both decreased compared to July 2019, down 38 percent and 23 percent respectively.

- U.S. purchases of coated mechanical (CM) papers in August decreased 37 percent compared to last August while the inventory level remained essentially flat (+0.4 percent) compared to July 2020. CM imports decreased 40 percent while exports increased 30 percent in July 2020.

- Uncoated mechanical (UM) paper shipments decreased 51 percent compared to August 2019 while the inventory level increased two percent compared to July 2020. UM imports and exports both decreased compared to July 2019, down 34 percent and 28 percent respectively.

Boxboard

Total boxboard production in July decreased seven percent compared to July 2019. It was down two percent when compared to the same seven months of 2019. The boxboard operating rate was 90.4 percent, down 3.3 points from July 2019 and essentially flat (+0.3 pts.) year-to-date.

- Solid Bleached Boxboard production in July decreased 15 percent compared to July 2019. It was down five percent when compared to the same seven months of 2019.

- Recycled Boxboard production in July decreased seven percent compared to July 2019. It was down one percent when compared to the same seven months of 2019.

- Unbleached Kraft & Gypsum production in July increased two percent compared to July 2019. It was up one percent when compared to the same seven months of 2019.

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BUSINESS BRIEFS

MassBio expands partnership with Veolia

■ The Massachusetts Biotechnology Council (MassBio) announced an expanded partnership with Veolia North America for its savings and rewards program, MassBio Edge. Veolia will serve as the preferred partner for all streams of waste management. The company will be an all-inclusive resource for transportation, disposal, training, and regulatory guidance related to all types of hazardous, non-hazardous, regulated medical waste, and low-level radioactive materials, and will offer comprehensive recycling and waste to energy programs.

As a one-stop-shop for all MassBio members, Veolia provides a complete range of services for life sciences, biotechnology, universities, hospitals, industrial and municipal customers needing to dispose of their waste. With more than 45 sales, services, treatment and disposal facilities in the United States, the company provides a full array of capabilities and facilities conveniently located to most industrial facilities throughout the country. With a dedicated MassBio service team, Veolia is a leader in reconciling economic effectiveness and environmental performance, with strict adherence to safety and compliance rules and guidance.

By aggregating the purchasing power of the 1,300+ member companies within MassBio, MassBio Edge allows members to have a strong presence in the marketplace and benefit from competitive discounts and premier customer service, which saves members more than \$175 million each year.

Hendrickson acquires business from STEMCO

■ Hendrickson acquired the Motor Wheel Brake Drum & Crewson slack adjuster business segments, based in Chattanooga, Tennessee and Berea, Kentucky, from STEMCO® and parent company EnPro Industries.

The business segments will operate as a division of Hendrickson Truck Commercial Vehicle Systems. The Motor Wheel & Crewson names will be kept and used as a product name going forward.

Hendrickson, a Boler company, is a manufacturer and supplier of medium- and heavy-duty mechanical, elastomeric and air suspensions; integrated and non-integrated axle and brakes systems; tire pressure control systems; auxiliary lift axles systems; parabolic and multi-leaf springs; stabilizers; and bumper and trim components to the global commercial transportation industry.

JSW Steel chooses Mark Bush as new CEO

■ India based, JSW Steel and its subsidiary JSW Steel (USA) Inc., has named Mark Bush as their new chief executive officer of the JSW operations in the U.S. Bush succeeds John Hritz, who will continue serving on the company board of directors.

Bush joins JSW Steel USA from SSAB, a specialty steelmaker. He will lead business units that produce steel slabs, coils, pipe and plate production and sales at Baytown, Texas and Mingo Junction, Ohio.

Elizabeth Montoya joins Rubicon's board

■ Rubicon, a software company that provides waste and recycling solutions to businesses and governments worldwide, announced that Elizabeth Montoya, the company's current chief of protocol and investor relations, and key advisor to the chief executive officer, has been appointed to Rubicon's Board of directors, effective immediately.

Montoya joined Rubicon in 2011 as its third employee and since that time has led many transformative projects, including the company becoming a Certified B Corporation. This certification means that the company has met, and continues to meet, rigorous standards of social and environmental performance.

Montoya played a central role in crafting Rubicon's original Environmental, Sustainability, and Governance strategy, and has overseen the implementation of world class governance and compliance standards.

In a prior role as director of Corporate and Social Responsibility, Montoya led Rubicon in becoming a signatory of the United Nations Global Compact, and in 2015 she was promoted to vice president of investor relations. This role saw her take on the management of the relationship between Rubicon and key investors such as Fifth Third Bank, Goldman Sachs, Wells Fargo, SUEZ, Wellington, and the New Zealand Superfund.

Before joining Rubicon, Montoya was director of programs and communications at the Humanities Council of Washington, DC.

AIST board and Foundation board to continue posts

■ The governing boards of the Association for Iron & Steel Technology (AIST) and the AIST Foundation will "pause in place" due to the coronavirus pandemic. The two boards change over each year following AISTech – The Iron & Steel Conference and Exposition. With the cancellation of AISTech 2020, AIST announces that the current seated members of the two boards will extend their terms for one year.

Those members slated to vacate the boards in May 2020 will remain through AISTech 2021. Those members slated to vacate the boards in May 2021 will remain through AISTech 2022.

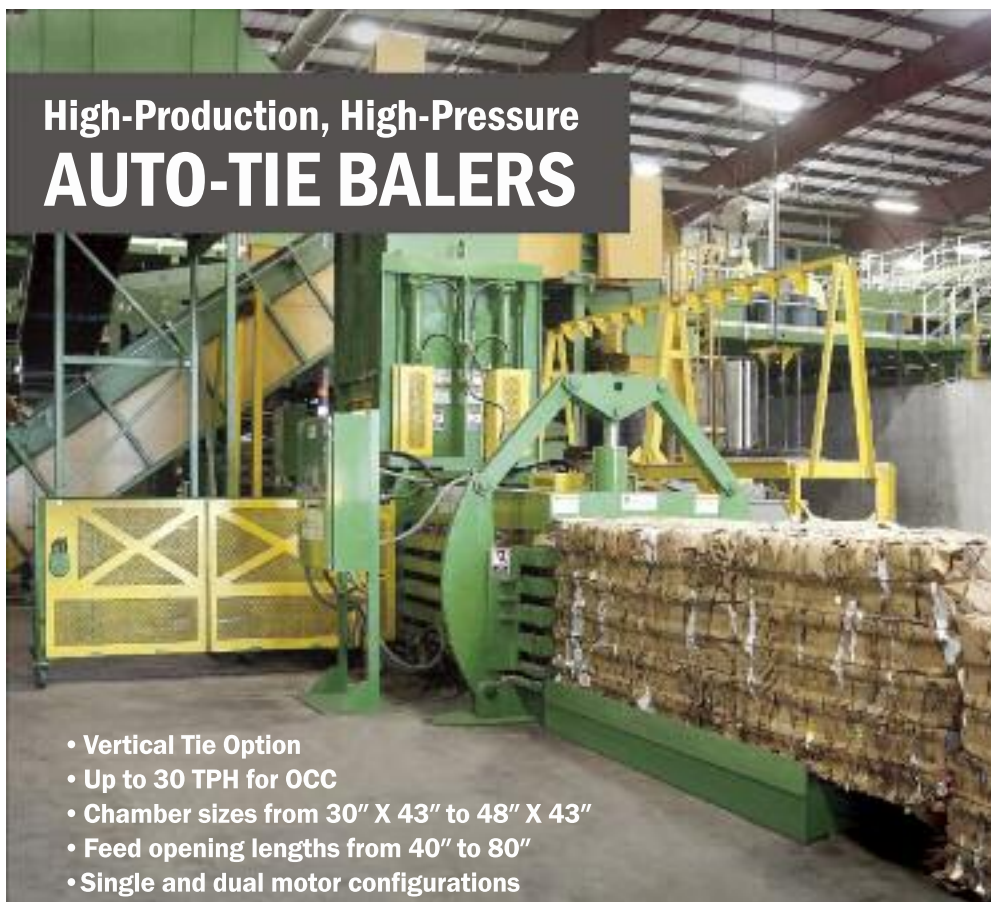
Ronald J. O'Malley, F. Kenneth Iverson chair, professor in Steelmaking Technologies and director of the Kent D. Peaslee Steel Manufacturing Research Center, Missouri University of Science and Technology, Rolla, Missouri, will continue in his role of president of AIST for 2020–2021. O'Malley succeeds James F. Dudek, vice president, manufacturing support and engineering, United States Steel Corporation, Gary, Indiana.

A woman got on a bus with her baby. The driver said, "Ugh – that's the ugliest baby I've ever seen!"

The woman walked to the back of the bus in a huff and sat down.

She said to the man next to her, "The driver just insulted me terribly!"

The man replied, "You go up there and tell him off. Go on. I'll hold your monkey for you."



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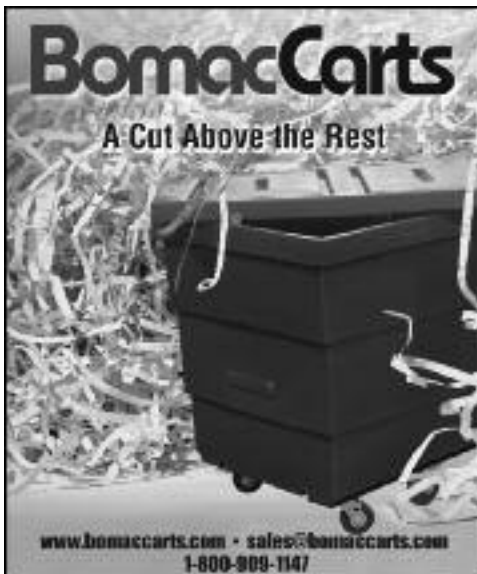
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Circular economic efforts surrounding e-waste

by MAURA KELLER

mkeller@americanrecycler.com

Advancements in technology means that the “latest and greatest” technological products and components are being replaced at mind boggling rates. To entice consumers to upgrade their electronics quickly, today’s phones, computers and other electronic devices are made to be thrown away – which is bad for both consumers and the environment. Luckily more and more manufacturers are recognizing the impact the ever-evolving product lines are having on the e-waste problem and are now working with recycling experts to enhance the product lifecycle and recyclability of today’s gadgets.

Bardia Vahidi, president and chief executive officer of IBEC Inc, says the current trends suggest that the amount of e-waste generated will increase substantially over the coming decades which makes e-waste a huge problem but it is also a golden opportunity for the industry.

“The e-waste management market size was valued at \$41.97 billion in 2019,” Vahidi said. “Only 17.4 percent of the 53.6 million metric tons (Mt) of e-waste were officially documented as formally collected and recycled. This means that iron, copper, gold and other high value, recoverable materials conservatively valued at \$57 billion were mostly dumped or burned rather than being collected for treatment and reuse in 2019.”

So how bad is the e-waste problem on a global scale? Gordon Smith, the chief executive officer of Sagent, said that unfortunately, e-waste tracking is limited. Only 41 nations publish statistics, and they are broken down by type, such as small IT equipment, large IT equipment, screens, refrigeration, and so on. What we do know about the state of the industry is that the world is expected to generate more than 50 million tons of e-waste this year, a number that’s been growing around 5 percent per annum.

Sagent is a telecom solutions provider that plays a role in helping to combat e-waste by assisting major



Workers tackle the ever growing pile of electronic waste. The world is expected to generate over 50 million tons of e-waste this year, which has been growing by approximately 5 percent per annum.

PHOTO COURTESY OF ELECTRONIC RECYCLERS

telecommunication companies and large corporations with finding ways to repair, resell, and replace technology to get the most out of their equipment. In 2019, Sagent diverted 8.5M lbs. of electronics from e-waste through these efforts.

“The largest driver of e-waste is the inefficiency in the redeployment process and lack of investment in the circular economy,” Smith said. “An electronic asset that is removed from the original user’s environment, most often has an economic benefit to another user in another market. Product lifecycle can be extended by efficiently finding users in the markets, and thus reducing contributions to e-waste streams.”

So how are manufacturers working with recycling companies in e-waste? Worldwide, only about 20 percent of e-waste is documented to have been collected and recycled.

“This number is highly motivational – the U.S. needs to aggressively

increase recycling,” Smith said. “We find that integrating e-waste recycling and disposal with our other services encourages more organizations to ‘close the circle’ on all equipment.”

The Global E-waste Statistics Partnership (GESp) predicts global electronics waste will reach 74 metric tons by 2030, fueled by higher electric and electronic consumption rates, shorter lifecycles and limited repair options.

“According to the United Nations, e-waste is now the world’s most rapidly-growing waste source. Without a reliable system of e-waste management, toxic substances such as mercury, cadmium, and lead are more likely to be released into the environment and cause permanent harm,” Vahidi said. “Business people and manufacturers have recognized the issue and have begun using tracking systems to gauge how far their e-waste goes. At the same time, a growing number of states have passed laws ban-

ning e-waste from going into landfills and incinerators.”

In California, the Department of Resources Recycling and Recovery (CalRecycle) established the Covered Electronic Waste (CEW) Recycling Program to offset the cost of compliantly handling certain unwanted electronic devices.

As Vahidi explained, when a California consumer buys a covered electronic waste (CED) from a retailer, the consumer pays a recycling fee that funds the CEW Recycling Program. The retailer collects those fees and remits them to the California Department of Tax and Fee Administration (CDTFA). CDTFA deposits the funds into the Electronic Waste Recovery and Recycling Account (EWRRA). Approved recyclers and collectors of CEW subsequently receive payments to offset the average net cost of appropriate recovery, processing and recycling activities.

See E-WASTE, Page B7

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Battery recycling market to reach \$8 billion by 2027

Battery recycling market will rise at strong CAGR of 10 percent during 2019-2027.

•The global battery recycling market was valued at \$3.45 billion in 2018 and is anticipated to expand at a CAGR of approximately 10 percent during the forecast period.

•Based on battery chemistry, the lead-acid segment held a dominant share of the global battery recycling market in 2018. Secondary lead obtained from recycling is of high quality and low cost.

•In terms of spent battery source, the automotive segment accounted for major share of the global battery recycling market in 2018. Increase in demand for automobiles, especially electric vehicles, across the globe is anticipated to boost the automotive segment during the forecast period.

•Based on end use, the extraction of materials segment constituted a significant share of the global battery recycling market in 2018. This can be ascribed to benefits of extraction of materials from used batteries, as the extracted material can once again be

used as a raw material for various products (including batteries).

•The battery recycling market in Asia Pacific is likely to expand at a rapid pace during the forecast period, owing to high investments in the automotive sector from countries in the region such as China and India

Key Drivers of Battery Recycling Market

•Raw materials used in the manufacturing of batteries such as lead, mercury, and cadmium pose a high threat to the environment and human health. Improper disposal of these materials in landfills increases the chances of these hazardous heavy metals finding their way and contaminating groundwater and surface water sources.

•The battery manufacturing industry has identified environmental hazards caused by improper disposal of these materials. It has taken initiatives to recycle batteries.

•The commercial value of raw materials used in the manufacture of batteries is high. These raw materials are also non-renewable. However, raw materials can be recycled indefinite

number of times. This helps maintain a supply of these raw materials from used batteries.

•Several non-profit organizations have also taken initiatives to increase awareness about battery recycling. This has boosted the flow of lead-acid battery scrap for recycling purposes. These non-profit organizations have collaborated with various automotive companies, battery manufacturers, and service providers for the same.

•Thus, rise in awareness about environmental and health hazards is expected to drive the battery recycling market during the forecast period

Asia Pacific Leads Battery Recycling Market

•Asia Pacific dominated the global battery recycling market in 2018. Dominance of Asia Pacific can be ascribed to the increase in demand for motor vehicles in the region, owing to rise in the per capita income. Approximately 10.65 million passenger light commercial vehicles were sold in Asia Pacific in 2018.

•China accounted for the leading share of the battery recycling market in the Asia Pacific in 2018. This was primarily ascribed to the introduction of stringent regulations for setting up recycling facilities for batteries of electric cars. In 2018, the Chinese Ministry issued provisional regulations mandating manufacturers of electric vehicles to set up a network for the collection and recycling of used batteries.

•In terms of market share, Europe follows Asia Pacific in the global battery recycling market. Enactment of stringent government regulations to

minimize environmental impact is a key factor boosting the battery recycling market in the region. Furthermore, rise in awareness about the benefits associated with battery recycling is expected to propel the battery recycling market in Europe.

Major Developments in Battery Recycling Market

On May 22, 2018, Gravita India Ltd. signed an agreement with Amara Raja Batteries Limited for collection and recycling of lead-acid battery scrap. As per this contract, the former would be collecting/purchasing lead-acid battery scrap from designated locations of the latter. It is a joint initiative toward achieving environment protection and sustainability, wherein used batteries would be recycled and pure lead/lead alloys would be supplied back to Amara Raja Batteries.

Competition Landscape of Battery Recycling Market

The global battery recycling market is dominated by several mid & large size players operating across the globe

Prominent players functioning in the global battery recycling are Johnson Controls International PLC, Battery Solutions LLC, East Penn Manufacturing Company, G&P Batteries, Retrie Technologies Inc., EnerSys, Umicore N.V., Exide Technologies, LI-CYCLE CORP., American Manganese Inc., Kinsbury Bros. Supply, Inc., Call2Recycle, Inc., Gravita India Ltd., and uRecycle.

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Aqua Metals successfully runs first V1.25b electrolyzer

Aqua Metals, Inc., which is reinventing lead recycling with its AquaRefining™ technology, has successfully performed test runs on the second iteration of its electrolyzer as part of the company's V1.25L program. The program consists of three iterations that are classified as V1.25a, V1.25b and the final iteration, V1.25L, the latter of which will be used to create the electrolyzer package for the equipment supply and licensing offerings.

This second iteration of improvements incorporates key changes intended to further enhance the AquaRefining value proposition by reducing build and operating costs and increasing uptime and throughput.

The core improvement in V1.25b is the new, larger single tank/frame assembly. The improved tank replaces the previous tank that required multiple components, while also serving as the frame for the electrolyzer. The new configuration should allow for the electrolyzers to run for months at a time with lower build, labor, operating and maintenance costs. V1.25b provides additional improvements of internal components scheduled to be introduced

in test runs in the coming weeks. The Company expects these enhancements to provide further cost and reliability improvements; drawing from the experience gained in 2018 and 2019 when the company produced over 35,000 certified high purity ingots that their partner, Clarios, a battery manufacturer, purchased for the manufacture of batteries.

The company continues to utilize and benefit from its stockpile of lead concentrate throughout the V1.25L program. As the company now prepares for the third iteration, V1.25L, additional runs of V1.25b will be performed to demonstrate consistency and to further validate the improvements. The V1.25L program continues to be on schedule, with an expected completion date in the first quarter of 2021.

As previously communicated, the V1.25L program does not fundamentally change the key operating parameters of the AquaRefining electrolyzers. The program is intended to build upon previous operational success and target key areas of "case hardening", thus providing a strong and robust AquaRefining equipment value proposition to the marketplace.

Vape recycling program begun

Auxly Cannabis Group Inc., a consumer packaged goods company in the cannabis products market, is partnering with the electronic waste recycling leaders at Greentec to provide cannabis retailers with a free-of-charge solution for the recycling of vape pens, cartridges and batteries. This industry wide sustainability effort is led by Kolab Project, the company's brand dedicated to providing Canadians with a carefully curated selection of cannabis products, while championing arts, culture and design.

Kolab Project-branded e-waste recycling bins will initially be available in participating Spiritleaf and Superette stores later this summer, with more retailers joining the program in coming months. Bins will accept vapes, cartridges and batteries from all licensed producers. Licensed cannabis retailers looking to provide vape, cartridge and battery recycling to their customers can get more information by contacting Kolab Project at info@kolabproject.com.

Greentec operates advanced technologies to safely process e-waste and recover rare earth metals. Its numerous industry leading Environmental and Health & Safety Certifications include ISO 45001, OSAS 18001 and R2.

"We are so proud to partner with Greentec – a leader in environmentally responsible e-waste recycling – to offer this important vape recycling solution to the entire industry," said Hugo Alves, chief executive officer, Auxly. "Building on our introduction of 100 percent biodegradable vape and pre-roll-packaging, this Kolab Project vape hardware recycling initiative furthers our efforts to improve environmental stewardship within the cannabis industry, and we look forward to working with Canada's retail community and consumers to roll out this program nationally."

Auxly's suite of branded vaping products, including Kolab Project and Foray, have been tested for contaminants, heavy metals leaching and emissions. In addition, Kolab Project recently introduced 100 percent biodegradable packaging for its vape pens and cartridges, as well as its cannabis pre-rolls.

E-waste management market to reach \$40 billion

The "E-Waste Management Market by Processed Material Type (metal, plastic, glass, others), source type (industrial electronics, consumer electronics, household appliances, handheld electronics, IT accessories equipment, PCBs, others), application (disposal, recycle) and region, global forecast 2018 to 2025" study by Androit Market Research provides an elaborative view of historic, present and forecasted market estimates.

The average lifecycle of most electronic devices has been continuously reducing. Fast obsolescence of electronic devices and gadgets have become the key factors leading to the production of e-waste. The electronic components that have attained its end-of-life for the consumer are called as electronic waste. These devices comprise materials possessing high value that can lead to human as well as environmental risk if incinerated or land-filled. Hence the global e-waste management market size is anticipated to reach \$40 billion by 2025.

Governments across various regions have made colossal efforts in recycling and extracting metals that hold threats for the environment as well as humans. The growing number of the reduced lifecycle of consumer electrical products such as laptops, cell phones, and computers is giving rise to a huge amount of electronic waste generation in the developing as well as developed nations, thereby promoting the growth of e-waste management industry.

The global e-waste management market contains metal, plastic, glass and other segments. The metal segment has a maximum revenue share within the e-waste management market in 2019. Electrical and electronic products encompass components that use metal shoulders, metal tracks, and conductive metals. Metals are fundamentally used in all individual components, micro-controller and printed circuit boards (PCBs), so the segment is projected to hold its dominance over the forecast period.

The global e-waste management market has strong competition among the well-established and new emerging players. These market players

target to gain a competitive advantage over the other players by participating in partnerships, mergers, and acquisitions and expanding their businesses.

The Asia Pacific area holds the title of one of the leading e-waste management market share regions with a significant growth rate over the forecast period. Growing disposable income in the evolving, as well as developed nations backed with the rising adoption of electronic devices, are the key factors for industry growth. Developed nations such as the U.K., U.S. and Canada export a substantial amount of electronic waste to Asia Pacific nations, which is anticipated to augur well for the regional industry over the forecast period.

The major players of the global e-waste management market are Electronic Recyclers International, Enviro-Hub Holdings, Aurubis AG, MRI (Australia), Sims Recycling, Boliden AB, Umicore S.A., Stena Metall AB, MBA Polymers, Tetronics and more. The e-waste management market is fragmented with the existence of well known global and domestic players across the globe.

For a direct link to request the report, view this article on www.AmericanRecycler.com.

Glass Recycling Coalition seeks input for third annual survey

The Glass Recycling Coalition (GRC) calls on haulers, material recovery facilities, community program managers, glass processors and manufacturers to weigh in on their glass recovery efforts across North America.

The annual survey collects aggregate data on types of glass collection programs, motivation for glass recycling, priorities and challenges in community recycling programs. The data are compared to previous years' surveys and provide a real time attitudinal snapshot of how glass is currently recycled, collected, processed and where it finally ends up.

"We realize that glass recycling opportunities may look different in varying parts of the U.S.," said Scott DeFife of the Glass Packaging Institute and GRC Leadership Committee. "GRC has been proactively working with communities to overcome barriers regionally, and this survey is another way we connect across the recycling value chain to identify issues and best practices throughout the country," said DeFife.

The year-to-year comparative information also allows the GRC to identify trends and informs the direction of future GRC efforts. The survey is conducted online with the report to be published later this year.

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EQUIPMENT SPOTLIGHT

Pulverizers

by MARY M. THORNTON

maryt@americanrecycler.com

Approximately 12 million tons of glass is generated as municipal waste every year, but only approximately 3 million tons are recycled – a process that can be done repeatedly with no loss in material quality. Glass is a 100 percent recyclable and that process also allows for the reduction of emissions, energy saving and the reuse of raw materials such as sand, soda ash, limestone and cullet, which is furnace-ready recycled glass.

Andela Products has been manufacturing glass recycling equipment and systems for over 25 years. The firm's glass crushers, pulverizers, breaker/crushers, trommel screens, surge hoppers and conveyors are available as stand alone products, or as part of a system for processing 1 to 20 TPH of waste glass. Andela products' unique selective reduction and separation technology crushes or pulverizes glass but leaves the non-glass debris un-crushed for easy separation. Cynthia Andela, president, stated, "Our customers use our crushers or pulverizers for CRT/TV electronics glass, mixed broken glass, separated glass bottles, windshields or industrial waste glass to make a cullet or tumbled glass aggregate for use in their community and of course, this also helps to keep glass out of landfills."

The technology in Andela machines is used to crush whole CRT/TV tubes, but the metal frame portion remains for easy removal. Over time, due to market demand for leaded vs. un-leaded glass, most CRT/TV tubes are now separated into panel (un-leaded) glass and funnel/frit (leaded) glass. Processors may also use Andela's pulverizer system. For example, Ruby Lake Glass, an Andela-owned, approved downstream recycler, pulverizes panel glass to make abrasives, and color coated recycled glass aggregate.

As the markets for glass continue to change and expand, from re-melt markets to industrial mineral or aggregate markets, Andela custom builds equipment and systems that will take glass mixed with other materials, and reduce the glass to the size specifications, cullet or sand sizes, required. Glass is separated from non-glass metals, plastics or paper. Andela products

allow users to recycle all types of waste glass; microwave plates, photocopier glass and any mixed glass found in the electronics. Andela systems turn glass into sand and stone aggregate without sharp edges, which can be used for pipe bedding, road construction, crushed glass abrasives, glass mulch for landscaping, sand for beaches and much more.

The Glass Gator from Cemco quickly and efficiently turns waste into recyclable cullet or soft-edged sand that can be repurposed into new glass containers.

The machine also cuts down on waste volume and waste-handling costs. "Because the Glass Gator safely and efficiently crushes eight glass containers down to the equivalent volume of just one container, waste fills trash receptacles with more glass and less air. This reduces the frequency of waste removal, the size and number of roll-off receptacles needed and associated costs. This volumetric reduction can decrease disposal and haulage costs by hundreds of dollars per month depending on related size and consumption rates," Jennifer Hise, vice president, noted.

The Glass Gator was designed for easy clean up and it can process thousands of bottles between screen replacements and blade maintenance. A simple detergent mix is all that's necessary to clean the inside of the



Cemco, Inc.



Andela Products

unit, and the tray can be easily removed and sanitized. Rotor parts and sizing screens are easy to replace, and Cemco also offers parts and service support worldwide.

With more than 55 years of experience in designing and manufacturing a full line of Turbo Vertical Shaft Impact crushers, Cemco provides innovative solutions for a variety of recycling applications including cement, glass, ceramic tile, drywall, brick, roofing tiles, copper slag and steel slag. The company offers a number of portable and stationary crushing systems that are easy to maintain and highly energy efficient.

Lisa Woodward, president of Compactors Inc., commented, "As landfill tipping fees have increased, one of our clients – a municipality, chose an alternative that would help them 'stay green' but also be financially palatable. With a \$25,000 recycling equipment grant used for the purchase of a glass pulverizer, employees helped construct the building for the machine and the pit below it, which helped with costs. Planning ahead on where to position the machine also paid off." Due to the various uses for the recycled glass produced by the city and interest from other cities as well (e.g., "glassphalt," for roads and even airport runways), pulverizer output is now being evalu-

See PULVERIZERS, Page B5

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Pulverizers

Continued from Page B4

ated as a possible revenue source for the city.

Compactors offers a range of products for glass recycling: pulverizer models (GP 1000 and 1500C) are meant for glass bottle recycling centers, municipalities and bottlers that process 1,000 to 1,500 lbs. per hour; crushers (the REM® GB Series and numerous other models), are for recycling centers, casinos and many other types of businesses. Trash compactor bags, baling wire and many other related items are also available. “We sell solutions. If you have a recycling or waste challenge, give us a call. We’ll find the perfect solution for you, then with input from our engineers, make suggestions for the machine that is optimal for your process,” said Woodward.

Julie VanderMoore, sales, explained how Bright Technologies Sebright Products “manufactures the X-Sizer glass crusher, which helps reduce the volume of disposable glass containers, up to 95 percent.” The stainless steel machines are designed to pulverize glass and also offer the following features: long life cycle and high throughput, and convenient, safe loading and inexpensive IBC Tote cullet containers. Direct drive gear motors process glass up to 15 cu. yards of glass per hour, providing volume reductions of up to 3 to 1. The crusher hopper accepts 1 yard of self-dumping carts, can accept IBC totes as cullet receptacle and features an interlocked cullet receptacle door.



Sebright Products, Inc.



Compactors Inc.

Electronic waste recycling takes off in rural Michigan

People in rural areas of Michigan have had more convenient opportunities to recycle their electronics waste since 2019, when the Michigan Department of Environment, Great Lakes, and Energy (EGLE) developed a recycling program for electronics waste, also called e-waste.

Word about the collections got out quickly and last year alone people in rural communities recycled over 300,000 pounds of e-waste. Through the first half of 2020 – even during COVID-19 – people have recycled some 100,000 pounds of e-waste.

The big response did not surprise Steve Noble, EGLE’s electronics recycling specialist.

“Rural communities pushed hard for a program, so we knew there was a lot of demand,” he said. “EGLE’s recycling programs and grants provide a great foundation for expanding proper electronics recycling, particularly in underserved rural areas across Michigan, like the Upper Peninsula (U.P.) and northern, lower Michigan.”

EGLE’s 2019 and 2020 e-waste program resulted in a partnership between Goodwill of the U.P. and northern Wisconsin and one of Michigan’s certified electronics recyclers – Comprenew. Working together, Comprenew@Goodwill was formed which now supports electronics recycling across the U.P.

As a result of that partnership, six permanent collection sites were estab-

lished, and multiple collection events were held. Goodwill retails stores in Houghton, Iron Mountain, Escanaba, Sault Ste Marie, Menominee and Marquette now have ongoing e-waste collections.

Comprenew also established a computer reuse program to assure greater access to low cost reliable computer systems and needed computer training. Commercial computers and related equipment that are collected from hospitals and universities are repurposed through their reuse program. Residential electronics collected through recycling programs have very limited reuse value.

Schoolcraft County Conservation District also established their own program with drop-off locations in the Manistique area. An environmental group in Alger County is well into the planning process and will open two drop off sites in the county this fall. Keweenaw Bay Indian Community and Bay Mills Indian Community have also been working with EGLE to add electronics to their recycling program.

“While COVID-19 has slowed progress in a couple locations, good progress is still being made to continue expanding proper e-waste recycling across Michigan,” said Noble.

A similar program is under development in the northern Lower Peninsula, funded through 2019 Rural Electronics Recycling and Recycling Infrastructure grants.

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NEW PRODUCT SHOWCASE



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ASV Holdings Inc. provides a premium operator experience with the introduction of the MAX-Series™ loaders.

The loaders include a new, next generation cab featuring the industry's best 360° visibility, a more spacious operator area, a fully adjustable seat, a new state of the art touch-screen display and more.

The machines are named for providing maximum comfort, control, performance, speed and productivity for maximum ROI. The initial models include the RT-65, VT-70 High Output, RT-75 and RT-75 Heavy-Duty MAX-Series Posi-Track® loaders.

ASV LLC
840 Lily Lane
Grand Rapids, MN 55744
800-205-9913
www.asvllc.com



BOMAC CARTS OFFERS NEW TILT TRUCK SERIES CARTS

New from Bomac Carts, the Tilt Truck series is a durable and versatile product line designed as an extension of Bomac's Heavy Duty Poly series to maximize efficiency in material handling.

The Tilt Truck series boasts products that are manufactured with a seamless durable polyethylene bodied tub, a powder coated steel frame and base and two 10" rubber wheels with 1 or 2 swivel casters. These features increase efficiency while offering strength and support through the heaviest of loads. The Tilt Trucks are available in .5 yd. and 1 yd. sizes, 3 different styles and 4 different standard colors.

Bomac Carts LLC
201 Badger Parkway
Darien, WI 53114
800-909-1147
www.bomaccarts.com



DOOSAN INFRACORE INTRODUCES THE DL580-5 WHEEL LOADER

Doosan Infracore North America, LLC, is expanding its wheel loader lineup with the new DL580-5 wheel loader. This machine offers customers a two-pass fill wheel loader for over the road, 24 ton capacity trucks, improving operational efficiency and reducing load-out cycle times.

The Doosan® DL580-5 wheel loader is able to move large amounts of abrasive material while providing operators with comfort and increased uptime. The DL580-5 also serves the operator and owner with its efficiency of offering the two-pass fill and bucket selections that are made to last through harsh material handling tasks.

Doosan Infracore, LLC
2905 Shawnee Industrial
Suwanee, GA 30024
678-714-6000
www.doosanequipment.com



SP INDUSTRIES DESIGNS ROLO DUMPER FOR LOW-CLEARANCE

SP Industries offers a low-profile Rolo Dumper to accommodate shallow dump heights. By adjusting the hydraulic dumper pivot point to 24" (normally 48 to 84"), the 4,000 lb. capacity dumper meets the required dump height of 105" for a 72" cart.

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SP Industries Inc.
2982 Jefferson Road
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269-793-3232
www.sp-industries.com



UNTHA ADDS CLOUD TECH TO OPTIMIZE SHREDDER USAGE

Named Untha Genius, the cloud technology uses several intuitive sensors to analyze a shredder's performance in real time. The aim is to maximize machine availability while minimizing maintenance and downtime costs.

Capable of analyzing up to 100 process values, data such as engine temperature, speed and torque, machine utilization, conveyor power, energy consumption and costs is all available via smartphone, tablet or PC, irrespective of the operator's location. An at-a-glance dashboard leads to further details and trends, via the secure storage of four months of data.

Untha Shredding Technology Inc.
1 Lafayette Road
Hampton, NH 03842
603-601-2304
www.untha-america.com

Record volume of glass recycled by Arlington, Virginia

With Arlington's new glass drop-off program, residents recycled over two million pounds of glass

Arlingtonians have recycled over a million pounds of glass at the drop-off center since January, a record likely to keep up if people quarantine according to *ARLnow*.

Last April, Arlington County abandoned its curbside glass recycling program. Separating and recycling glass has become too expensive. Instead, Arlingtonians were asked to drop off their glass recycling at dedicated containers that were then taken to Fairfax County for reuse in construction, building, and

recycling into new glass products.

Since the launch of the drop-off recycling program, county officials say there have been two million pounds of glass recycled, half of which has been over the last few months.

"A million pounds since January was impressive and we'll likely see another million at a much faster pace for obvious reasons," as residents stay at home amid the pandemic, said Department of Environmental Services spokesman Peter Golkin.

Lithium-ion battery recycling pilot plant project commences

American Manganese Inc. reported that the company's contract research lab, Kemetco Research, has installed and prepared the recently received specialized equipment for continued optimization on the company's lithium-ion battery recycling pilot plant project. American Manganese's goal for these engineering upgrades is to further increase process capacity, without sacrificing the high recovery of lithium, nickel, cobalt, manganese and aluminum. Analysis of results to be reported as received.

"We believe our investment in continued improvements advances our business opportunities with global leaders in the lithium-ion battery industry who share our vision," said Larry W. Reaugh, president and chief execu-

tive officer of American Manganese. "We look forward to expanding these potential opportunities into joint ventures and the licensing of the RecycLiCo process."

American Manganese has developed the patented RecycLiCo™ process that offers a closed-loop and environmentally friendly solution for the recycling of lithium-ion battery cathode materials. The process achieves up to 100 percent recovery and high purity of materials such as lithium, cobalt, nickel, manganese, and aluminum. The RecycLiCo process was designed with the goal to produce recycled battery products that could be seamlessly integrated into the re-manufacturing of battery cathodes with minimal processing steps.



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“For example, Waste Management Company has Sony & LG Electronics Recycling Programs that make it easy for residential consumers to dispose/recycle electronics in an environmentally-safe way,” Vahidi said. “Consumers can bring their unwanted Sony or LG products to any participating Waste Management eCycling drop-off center and recycle it for free.”

Manufacturers’ Increasing Role

Tricia Conroy, executive director, MRM (Electronic Manufacturers Recycling Management Co.), which was founded by electronics manufacturers to provide electronics recycling planning and programs in the U.S., said that the leading electronics manufacturers are all working with recyclers and third-party groups to ensure proper handling, disposal and recycling of electronic products that have reached the end of their useful life.

“The past five years have seen significant growth in the number of electronics recyclers getting certified by responsible certification bodies that require electronics recyclers to meet specific standards and pass regular certification inspections,” Conroy said. The certifications examine business practices, downstream outlets for material and other important recycling concerns.

MRM believes manufacturers are responsible for much of this growth in certification that has raised industry recycling standards, since nearly all electronics manufacturers arranging electronics recycling in the U.S. require that recyclers be third-party certified.

“Manufacturers have actively supported both certifying bodies so that this work with the electronics recycling industry can grow,” Conroy said. “In addition, many manufacturers perform regular audits and inspections of recyclers on their own or using a third party to ensure that the recyclers they use employ proper methods for collecting, handling and recycling electronics.”

E-waste Recycling Challenges

Electronic waste, or e-waste, is the fastest growing municipal waste stream in America, according to the EPA. Due to the lack of adequate public awareness, lack of government policy and legislation, lack of an effective collection system more than 80 percent of e-waste ends up in landfills.

“Even the small percentage of electronics that are properly collected are managed badly. The dominance of the recycling sector by an uncontrolled, ill-equipped informal sector has caused most e-waste to still go to the landfill,” Vahidi said. “Some of these recyclers don’t recycle – they export – a large amount of e-waste that is collected for recycling is shipped overseas for dismantling under horrific conditions, poisoning the people, land, air, and water in China, other Asian nations, and Ghana and Nigeria in western Africa.”

Conroy added that the downstream outlets for commodities are always a

challenge for electronics recyclers. “Ensuring the responsible disposal of plastics, CRT-glass, circuit boards and other material that are the result of electronics recycling requires constant vigilance,” Conroy said. “In addition, producing clean streams of material that maximize the recyclability of the commodity is an operational challenge. Finally, the price swings for commodities present challenges to business planning and profitability for e-waste recyclers.”

The health concerns associated with recycling e-waste is another big challenge facing this segment of the recycling industry. The mixed plastic content and the presence in the e-plastics brominated flame retardants (BFR) and organo-phosphorus flame retardants (OPFR) pose health concerns. “The plastics in electronics represent a larger fraction of the e-waste stream than the metals, and there are fewer options for recycling or reuse of electronics plastics,” Smith said.

Smith said that one of the most important roles manufacturers play in minimizing e-waste is closing the educational gap. For example, Sagent is continuously educating its customers to maximize the supply of electronic infrastructure and consumer devices through their programs.

“More companies need to get involved in the circular economy. We’re partnering with some of the largest companies in the world to ensure their reverse supply chains are running as efficiently as possible,” Smith said. “The more companies that can get on board; the better.”

Looking Ahead

Conroy said that consumers want to recycle their electronics in an environmentally responsible way. Both businesses and citizens continue to demand responsible recycling for their products.

“The nature of what is recycled is changing as the number of old, cathode ray tube (CRT) TVs in the waste stream is falling and more flat screens and smaller electronics are being recycled,” Conroy said. “The industry’s constant challenge is to ensure that products are being reused and recycled using safe methods and responsible downstream outlets for the commodities produced from recycling.”

“Electronics manufacturers understand their role in the circular economy,” Conroy said. “They are constantly pursuing initiatives that address the lifecycle of electronic products.” For example, manufacturers are increasingly incorporating recycled plastic into their products to increase the demand for plastics and the value of this commodity in the marketplace.

“Since I started in this field a number of years ago, manufacturers have made many improvements in the recyclability of their products as well—such as reducing the number of fasteners used so disassembly is easier,” Conroy said. “These types of changes will continue as electronics manufacturers assess and improve the lifecycle impacts of their products.”

Coalition awards first gold MRF glass certification



PHOTO COURTESY OF SIMS JERSEY CITY

The Glass Recycling Coalition (GRC) awarded the first gold level MRF Glass Certification to materials recovery facilities at Rumpke Waste & Recycling and Sims Municipal Recycling (SMR). Two Sims Municipal Recycling’s MRFs and three Rumpke Waste & Recycling’s MRFs received this honor for their processes for cleaning up glass and integrated beneficiation.

“These MRFs are leading the way by not only cleaning up glass in the MRF, but their integrated glass beneficiation ensures a higher quality glass,” said Jim Nordmeyer, vice president global of sustainability, O-I Glass and GRC leadership committee.

Both Sims Municipal Recycling and Rumpke Waste & Recycling have a pre-cleaning process to remove glass early. That MRF glass is then taken to a company-owned glass processor for further processing.

“Environmental sustainability is a core pillar of our company mission,” said Bill Rumpke Jr., president and chief executive officer of Rumpke. “We continue to invest in recycling and look for innovative ways to put material to good use. Over the last 10 years, we made significant investments to operate the most technologically advanced recycling systems in our service footprint.”

Rumpke Waste & Recycling boasts a state-of-the-art glass recycling beneficiation plant in Dayton, Ohio. The Dayton plant produces 60,000 to 70,000 tons per year for glass insulation and bottle manufacturing. End markets are found in Ohio and neighboring Indiana at fiberglass and bottle manufacturers.

“It made financial sense to build our own glass beneficiation plant; however, that may not be the same for other facilities based factors like volume and proximity to glass cullet customers,” said Tom Outerbridge, general manager of Sims Municipal Recycling (SMR). “In those instances, we encourage communities to remain committed to glass recycling and to reimagine how to best capture this resource given local and regional conditions.”

SMR’s New Jersey location is home to SMR’s beneficiation facility. The glass plant includes optical sorters to color-sort cullet for sale to glass furnaces and cleaning equipment to make glass aggregate from the glass that cannot be color sorted. SMR’s glass plant processes over 100,000 tons per year and can ship by rail and barge in addition to trucks.

Sims Municipal Recycling’s New Jersey MRF, touts an on-site beneficiation component, cleans and sells cullet directly to furnaces. The glass facility processes an estimated 100,000 tons per year can ship by rail and currently utilizes barges in addition to trucks. Their Brooklyn, New York MRF has pre-cleaning and also brings glass to the site.

GRC’s website currently hosts an interactive map showing MRFs, glass processors, and end-markets across the country. GRC certified MRFs will be noted on this map along with public recognition of this certification.

An independent committee scores certification levels into gold, silver, and bronze certifications.

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