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The evolving construction & demolition recycling industry

by MAURA KELLER

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According to an ongoing report by Transparency Market Research, by 2025 it is projected that there will be up to 2.2 billion tons of solid waste generated globally by cities. As Thomas Walker, assistant project manager at NYC-based construction and development services firm CNY Group pointed out, this number has almost doubled since 2012; and building materials account for half of solid waste generated. In addition, according to Allied Market Research, the global construction and demolition (C&D) waste recycling market is expected to reach \$149 billion by 2027.

“It is safe to say that we should expect more C&D waste, and our facilities and processes need to be prepared,” Walker said. “However, the industry is starting to become more knowledgeable and adept in dealing with these problems. With more projects adopting LEED or similar standards, many construction professionals are being exposed to waste management standards, and in turn, we are playing a bigger role in the education of the tradespeople about these ideas.”

Walker said this trickle-down effect, ultimately will better prepare stakeholders across the development landscape, for any potential legislation and requirements in the future.

“As we continue to build on our commitments to going green, there is also the possibility for innovation in sorting and recycling technologies as attention is garnered for this issue,” Walker said.

Luke Lombardi, P.E., senior sustainability engineer with Buro Happold’s Los Angeles office, said there is an ongoing shift towards creating and enabling a circular economy through design for deconstruction, use of material passports to track critical information, and thinking about buildings as material banks holding valuable resources in reserve.

“People at the forefront of this shift are exploring ways to leverage new technologies like blockchain, and major design firms are developing tools to support materials sharing and limiting waste during construction,” Lombardi said.

Isabelle Kavanagh, EIT, sustainability engineer with Buro Happold, pointed out that some building material manufacturers are creating takeback programs for their products (for example, Armstrong, USG, & CertainTeed ceilings, Mohawk, Interface and Starnet



Pictured is the Academy Museum of Motion Pictures in Los Angeles, California where C&D waste diversion and recycling were major considerations, with sustainability consulting led by Buro Happold. Luke Lombardi, of Buro Happold, feels that there is an ongoing shift towards a circular economy, through design for deconstruction and thinking about buildings as material banks holding valuable resources in reserve.

PHOTO BY JOSHUA WHITE
JWPICURES/@ACADEMY MUSEUM FOUNDATION

carpets, Tarkett flooring), that accept and recycle their products into new materials.

“It is important for industry professionals to be aware of these manufacturers and specify their products when possible, to encourage growth of a circular economy,” Kavanagh said. “There is also a trend towards innovation in the C&D waste industry, with some companies creating new products and materials from waste, such as Resin8 from CRDC, wood plastic composite from Conenor & Technalia, and Sika’s additive for concrete recycling. There is also

innovation in the waste sorting and processing space, using robotics and other technology to automate processes.”

Growth Potential

William Turley, executive director of the Construction & Demolition Recycling Association (CDRA) said there are several key industry trends that C&D recyclers need to be aware of.

“There is increasingly limited landfill space and recycling markets are always challenging for construction materials. There is nowhere else to get rid of the material except to ship it by

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Commerce implements sweeping restrictions on exports to Russia

Additional stringent economic measures may be implemented in the near future

The U.S. Commerce Department, through its Bureau of Industry and Security (BIS), responded to Russia's further invasion of Ukraine by implementing a sweeping series of stringent export controls that will severely restrict Russia's access to technologies and other items that it needs to sustain its aggressive military capabilities. These controls primarily target Russia's defense, aerospace and maritime sectors and will cut off Russia's access to vital technological inputs, atrophy key sectors of its industrial base, and undercut its strategic ambitions to exert influence on the world stage. BIS's actions, along with those of the Department of the Treasury, are part of the Biden-Harris Administration's swift and severe response to Russian aggression. These measures also reflect momentous cooperation among the United States, the European Union (EU), Japan, Australia, United Kingdom, Canada, and New Zealand, with more expected to join, in aligning on export control policies and requirements. If necessary, based upon any subsequent destabilizing actions by Russia, the U.S. government will follow up in the days to come with additional stringent economic measures.

The export control measures are the most comprehensive application of Commerce's export authorities on U.S. items, including technology, as well as on foreign items produced using U.S. equipment, software, and blueprints, targeting a single nation. These actions, in concert with those that our partners are taking, restrict Russia's access to items that can support the country's defense industrial base and military and intelligence services.

"Russia's actions are an immediate danger to those living in Ukraine, but also pose a real threat to democracy

throughout the world," said Secretary of Commerce Gina M. Raimondo. "By acting decisively and in close coordination with our allies and partners, we are sending a clear message that the U.S. of America will not tolerate Russia's aggression against a democratically-elected government. The Commerce Department, along with our partners internationally and across the Biden-Harris Administration, will continue to use every tool at our disposal to restrict products, software, and technology that support Russia's military capabilities."

BIS's Russia specific export control measures impose a policy of denial on sensitive items Moscow relies on for its defense, aerospace and maritime industries. These items, many of which were not previously subject to controls when destined for Russia, include semiconductors, computers, telecommunications, information security equipment, lasers, and sensors. This rule also imposes stringent controls on 49 Russian military end users, which have been added to BIS's Entity List. The EU, Japan, Australia, United Kingdom, Canada and New Zealand have announced plans to implement substantially similar restrictions and are exempted from new requirements for items produced in their countries. This powerful international response will have serious consequences for the Russian military and defense sector and sends a clear message of our solidarity with the Ukrainian people and additional countries are expected to join in this effort.

These BIS actions were taken under the authority of the Export Control Reform Act of 2018 and its implementing regulations, the Export Administration Regulations.

ISRI hires former police chief

The Institute of Scrap Recycling Industries (ISRI), has named former police chief Todd Foreman as its new director of law enforcement outreach. Foreman has been in law enforcement since 1993, and most recently served as chief of police for the Bedford, Virginia police department.

While Foreman is new to ISRI, the law enforcement role has been a part of ISRI for over 10 years.

In his role, Foreman will also lead ISRI's online efforts to deter materials theft that includes StopMetalsTheft.org and ScrapTheftAlert.com, both of which are valuable resources for recyclers, law enforcement and others.



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Evolving

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rail, barge or even truck across long distances out of state,” Turley said.

Turley also has seen an increase in regulation of waste, including C&D, by many states and localities that traditionally have not been as strict on oversight.

“This can be both good and bad. Overregulation can stifle markets, but there is a strong need to police bad actors,” Turley said. And many within the construction and demolition industry are seeing post-COVID growth as various sectors of the economy reopen, such as hospitality.

“Volume has increased across the board; which in turn causes more construction and demolition waste,” said Walker. “Construction professionals will have to determine how sites and projects can be built more efficiently in terms of providing input on material selection, reducing waste during construction, and having a plan for recycling inevitable waste.”

CNY Group has been working through this process on two multifamily housing development projects and found the most success through a combination of early discussions with all stakeholders, stringent QA/QC programs on site, and further innovation in technologies and processes.

“When we come to the table, we find that there is often the perception that these strategies are going to cost more, and while CNY Group has the data to show that’s not the case, it’s often a deterrent for some stakeholders,” Walker said. “In fact, between

over-purchasing temporary or unnecessary materials and paying overtime for the labor to haul away waste at the end of the day, not recycling or having a plan to recycle is actually more costly in the long run.”

Legislative Initiatives in the C&D Recycling Space

Within the legislative and regulatory environment, it is mostly regulation that affects C&D recycling. As Turley explained, some states, such as California, are pushing hard to increase C&D recycling and improve markets. An example is the California Recycling Commission’s plan to increase the amount of recycled content to 10 percent from the current 4 percent for new drywall sold in the state.

Turley also pointed to Massachusetts Department of Environmental Protection (DEP), which has set a 15 percent minimum performance standard for C&D recycling facilities. If they don’t make that threshold, they are supposed to send all their material to a facility that does.

“Now, 15 percent may not seem high, but the DEP is including the denominator bulks, such as mattresses and furniture, which can be challenging to recover. The agency plans to increase that recycling rate in the future, even though as a consumer it doesn’t support construction material recycling markets,” Turley said.

Maine also is trying to legislate against the importation of out-of-state C&D material because facilities are taking in large amounts of it from throughout New England, recovering what they can and sending the residual to local landfills, which are being reduced in number.

“Disposal bans are also starting to pop up for some materials,” Turley said. “Massachusetts has been the most aggressive for many years, requiring that wood, concrete, asphalt, drywall and other materials pass through a recycling facility before it is disposed.”

Legislation with the most potential impact is environmental justice, which is also one of the two core focuses of the Biden Administration. Environmental justice legislation has already passed in New Jersey, and many other states are looking to copy those requirements.

“The tenets of this concept allow more community participation in allowing what businesses are allowed to operate in their area, especially in disadvantaged minority regions,” Turley said. “Facilities could be denied a permit to operate, or permit renewal, after years of operation, under these laws. The CDRA is helping its members manage these issues.”

In addition, some key legislation on the city and state level is largely focused on setting C&D diversion and recycling requirements. Some examples include:

- New York State Senate Bill S3148: The bill requires that contractors in New York State reuse or recycle at least 25 percent by weight of their C&D debris, for projects that have been issued a permit with an application date within one year of the effective date of the bill; and 50 percent by weight of C&D debris for projects issued a permit with an application of more than one year.

- New York State Senate Bill S6228 sets the same C&D recycling requirements for New York City specifically

- CalGreen C&D waste: CALGreen requires covered projects to recycle and/or salvage for reuse a minimum 65 percent of nonhazardous construction and demolition waste or meet a local construction and demolition waste management ordinance, whichever is more stringent.

Currently in NYC, which tends to lead the way in terms of sustainability policy, there is no required standard or benchmark for the recycling of C&D waste. As Walker explained, the Rules of the City of New York note that construction waste is and should be source separated and recycled – but there is a lack of legislation requiring recycling or certain minimum benchmarks.

“This is surprising given, per EPA statistics, the U.S. generated over 600 million tons of construction and demolition debris in 2018 – which doubles municipal waste in the same year,” Walker said. “Further, there are not many facilities that can handle the waste itself, which poses a significant challenge in terms of how much they can actually process. Considering these stats, it is inevitable that we can expect legislation soon to standardize and create requirements for waste diversion and recycling streams, and recycling of construction waste by tonnage.”

This is already the norm with LEED, which requires projects to recycle 50 percent of construction and

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PAPER

The majority of Americans have access to a community paper recycling program

The American Forest & Paper Association (AF&PA) released a new report indicating that a vast majority of Americans have access to paper and paperboard recycling programs.

The 2021 AF&PA Access to Recycling Study also finds more Americans, 79 percent, now have access to residential-curb programs making it easier to recycle paper at home – an increase of more than 14 million people.

“Paper recycling programs are well developed and widely accessible across the U.S.,” said AF&PA president and chief executive officer Heidi Brock. “Household action and our industry’s investment in paper recycling are primary reasons why our industry recycles nearly twice as much paper today as it did more than three decades ago.”

Items such as cardboard, mail, newspapers, office paper, magazines, paperboard boxes with and without poly coatings, paper bags, liquid packaging cartons and pizza boxes have a consumer access rate of 60 percent or more.

“With such a high rate of collection, Americans can feel confident knowing that paper products, whether it’s the shipping box that lands at your doorstep or the box delivering your next pizza, can and should be recycled,” Brock said. “Those recycled paper fibers can be reused five to seven times to make new paper and cardboard products.”

The 2021 AF&PA Access to Recycling Study is a comprehensive national report that tracks and measures the growth of consumer access to com-

munity paper and paperboard recycling in the U.S.

In 2021, the U.S. paper industry reached a record level for containerboard production and saw a 6.8 percent increase, compared to 2020, in the consumption of old-corrugated containers at mills to make new products.

“Paper recycling continues to be an environmental success story with a positive impact on the broader circular economy,” Brock said. “Our industry has a demonstrated track record as a responsible producer. As part of our Better Practices, Better Planet 2030 sustainability goals, we are also committed to further advancing the circular value chain through the production of renewable and recyclable products to meet evolving customer needs.”

Paper company achieves net zero water validation

Green Bay Packaging announced that the Green Bay mill achieved net zero water in its production of 100 percent recycled containerboard paper, the first-ever UL with validation of this environmental claim.

Water is a vital community resource and Green Bay Packaging is committed to industry leading sustainable water use.

The net zero water system at the Green Bay mill reduces water demand through use of reclaimed water and alternative water sources, offsetting the need for freshwater consumption.

The goal in achieving “net-zero water” is to transform a water-intensive process into a more efficient process, returning more water to the water source than has been removed.

Evolving

Continued from Page 4

demolition waste by ton at minimum, with at least three diversion streams. As Walker explained, the LEED points system has driven more awareness, and there are organizations that are helping to push the effort from a grassroots level.

“We feel strongly that these baseline requirements should be more widespread if we’re going to effectively

combat the waste from the construction volume we’re seeing today,” Walker said.

Industry Challenges

One of the key challenges facing the C&D recycling industry is availability of C&D material recycling facilities in more remote areas of the country. As Kavanagh pointed out, in urban areas, there is often widespread and robust C&D waste collection, separation, transfer, and recycling facilities that enable C&D waste to be successfully recovered. The same can-

not said for projects located in less urban areas – it’s still possible to sort and separate C&D waste on site, but there may not be an appropriate facility nearby that the materials can be taken to for processing.

“Also, recycling materials that are more difficult to recover, such as window glass, flooring, insulation, gypsum, composite materials and hazardous waste, remains a big challenge,” Kavanagh said. “The properties and makeup of these materials and/or the lack of effective technology for recycling them means that they are usually sent to landfill, decreasing diversion rates.”

Source separation can also be a challenge, especially when buildings are not designed for easy deconstruction. It requires extra effort, time, and physical space to separate out materials on project sites, causing challenges for the general contractor.

“If the source separation is not done carefully, it can also cause difficulties for the sorting and processing facilities and decrease the volume of material that can be properly recycled,” Kavanagh said.

“Government entities can do all the disposal bans they want, and because of extended producer responsibility (EPR), manufacturers want their products recovered, but at the end of the day if there is nowhere for the end product to go, it is going to a landfill,” Turley said. “Unfortunately there is often a lack of supportive regulation to allow recyclers to find those end markets.”

Another challenge is making sure the material is being recycled. Even if there is a requirement that a certain recycling rate be met by a facility, there is no guarantee that rate is being met outside of the word of the plant operator.

“This happens all the time in LEED, where untrue recycling rates are claimed for green building proj-

ects and points are awarded. The CDRA is working with USGBC to stop the cheating that has been going on for years under the recycling credits,” Turley said. “Another fundamental challenge is getting insurance for all waste facilities. There have been too many claims, especially around facility fires, and many carriers are no longer writing policies for the industry. Those that are still around have jacked up rates tremendously, making this an incredibly large part of the cost of doing business.”

Challenges aside, experts agree that the C&D recycling industry will continue to grow and demand for C&D recycling will increase. As such, C&D recyclers can work to expand their processing capacity, expand facility locations to areas with less available C&D recycling infrastructure, and look into innovative methods to recycle difficult to recover materials.

“We expect the recycling of construction materials to continue to grow for a variety of reasons. First is a push by states and municipalities that want to see more material recovered,” Turley said. “Second is the pressure EPR is putting on all manufacturers, including those for construction materials, which is spurring those manufacturers to strongly support environmentally friendly disposal options for their products, including closing the loop.”

Turley recommended C&D recyclers follow what is happening on the state and local regulation front. Related to that, also follow national recycling organizations. The CDRA is implementing a tool for members that will provide them with information on recycling and other important bills going through their state legislatures.

“These can impact your business more than most other factors,” Turley said.



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METALS

Finished steel imports up 43 percent in 2021

Based on revised Census Bureau data, the American Iron and Steel Institute (AISI) reported that the U.S. imported a total of 31,476,000 net tons (NT) of steel in 2021, including 22,770,000 NT of finished steel. These totals represent increases of 43.0 percent and 41.0 percent respectively, vs. 2020.

Final Census Bureau data for December 2021 showed total steel imports at 2,885,000 NT, including 2,255,000 NT of finished steel (down 0.7 percent and 4.0 percent, respectively, vs. November revised data). Finished steel import market share was 24 percent in December and 21 percent for full year 2021.

Key steel products with a significant increase in 2021 vs. 2020 were hot rolled sheets (up 89 percent), plates in coils (up 75 percent), sheets and strip all other metallic coatings (up 69 percent), oil country goods (up 67 percent)

and wire rods (up 62 percent).

Products with a significant increase in imports in December over November were tin plate (up 51 percent), standard pipe (up 30 percent), line pipe (up 26 percent), mechanical tubing (up 21 percent) and ingots and billets and slabs (up 13 percent).

In 2021, the largest volumes of steel imports were from Canada (6,970,000 NT, up 34 percent vs. 2020), Mexico (4,760,000 NT, up 44 percent), Brazil (4,365,000 NT, up 8 percent), South Korea (2,748,000 NT, up 36 percent) and Russia (1,633,000 NT, up 280 percent). In December, the largest suppliers were Canada (559,000 NT, up 5 percent from November final), Mexico (553,000 NT, up 21 percent), Brazil (253,000 NT, up 70 percent), South Korea (242,000 NT, up 9 percent) and Vietnam (165,000 NT, down 9 percent).

U.S. IMPORTS OF FINISHED STEEL MILL PRODUCTS

BY COUNTRY OF ORIGIN (Thousands of Net Tons)

	DEC 2021	NOV 2021	2021 Full Year	2020 Full Year	% Change 2021 Annual vs. 2020
CANADA	559	531	6,970	5,209	33.8%
MEXICO	553	455	4,760	3,314	43.6%
BRAZIL	253	149	4,365	4,048	7.8%
SOUTH KOREA	242	222	2,748	2,015	36.4%
RUSSIA	114	300	1,633	430	280.2%
GERMANY	82	75	1,233	892	38.2%
JAPAN	74	154	1,088	807	34.8%
TURKEY	83	111	1,019	562	81.2%
VIETNAM	165	180	943	314	200.2%
TAIWAN	110	72	886	573	54.7%
NETHRLANDS	45	78	576	463	24.4%
CHINA	81	33	471	377	24.9%
INDIA	80	30	395	165	138.8%
ROMANIA	29	49	376	204	84.6%
U. ARAB EMIRATES	52	43	363	255	42.4%
All Others	365	422	3,651	2,391	52.7%
TOTAL	2,885	2,906	31,476	22,019	42.9%

Eriez appoints Nelson as a VP

Eriez has appointed Eric Nelson as vice president-international operations and business development. Nelson worked for Eriez previously, serving the company as interim managing director of Eriez-China until 2018.

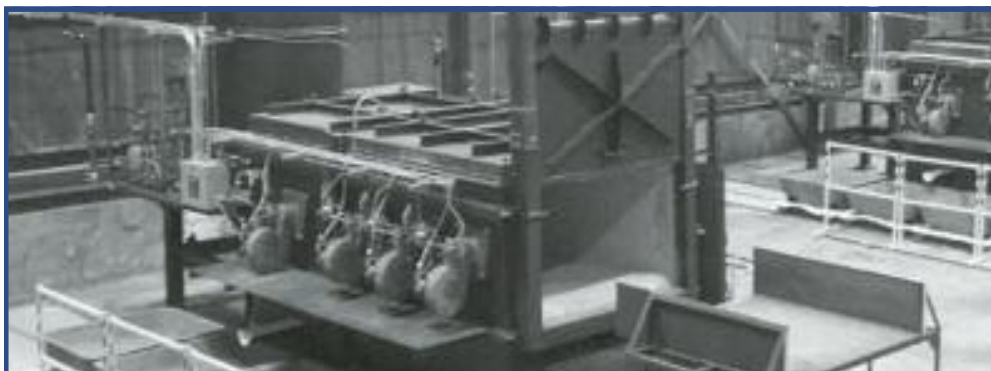
According to Eriez vice president-international Jaisen Kohmuench, Nelson will collaborate in developing global business strategies and assist regional

Eriez sales directors in uncovering and cultivating business advancement opportunities across Europe, Middle East and Africa (EMEA) and Asia-Pacific (APAC) regions. He will be primarily responsible for coaching and advising local teams, with the overall goal of continuing Eriez' strategic growth plans.

Nucor completes acquisition

Nucor Corporation has successfully completed its acquisition of a majority ownership position in California Steel Industries, Inc. (CSI) by purchasing a 50 percent equity interest from a subsidiary of Vale S.A. for a cash purchase price of \$400 million, adjusted for net debt and working capital at closing, as well as a one percent equity ownership stake from JFE Steel Corporation.

CSI is a flat-rolled steel converter with the capability to produce more than two million tons of finished steel and steel products annually. The company has five product lines, including hot rolled, pickled and oiled, cold rolled, galvanized and ERW pipe. Key end-use segments served by CSI include customers in the construction, service center and energy industries.



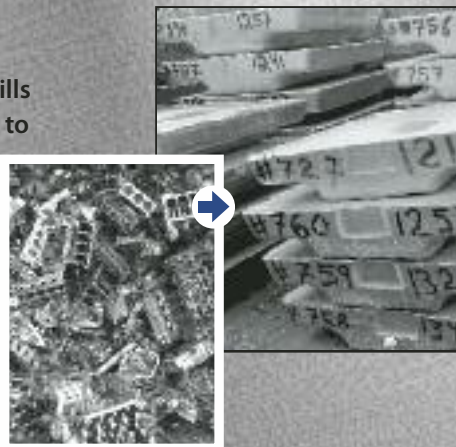
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Commodity		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
#1 Bushelings	per gross ton	\$416.00	425.00	451.00	541.00	615.00
#1 Bundles	per gross ton	400.00	410.00	439.00	531.00	600.00
Plate and Structural	per gross ton	398.00	450.00	487.00	501.00	537.00
#1 & 2 Mixed Steel	per gross ton	367.00	431.00	462.00	476.00	512.00
Shredder Bundles (tin)	per gross ton	220.00	225.00	274.00	284.00	295.00
Crushed Auto Bodies	per gross ton	220.00	225.00	274.00	284.00	295.00
Steel Turnings	per gross ton	221.00	229.00	281.00	299.00	398.00
#1 Copper	per pound	4.20	4.19	4.24	4.09	4.42
#2 Copper	per pound	3.98	3.99	3.98	3.89	4.13
Aluminum Cans	per pound	.84	.85	1.01	.88	.90
Auto Radiators	per pound	1.99	1.85	2.27	2.41	2.52
Aluminum Core Radiators	per pound	.79	.73	.77	.76	.77
Heater Cores	per pound	1.56	1.54	1.60	1.79	1.98
Stainless Steel	per pound	.84	.85	.91	.93	.99

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AUTOMOTIVE

KAR Global agrees to \$2.2 billion sale of Adesa US

KAR Auction Services, Inc., dba KAR Global, a digital marketplace platform for wholesale used vehicles, has reached a definitive agreement pursuant to which Carvana will acquire the company's Adesa U.S. physical auction business. The all-cash transaction is valued at \$2.2 billion and includes all auction sales, operations and staff at 56 Adesa U.S. vehicle logistics centers and exclusive use of the Adesa marketplace in the

U.S. The agreement is closely aligned with KAR's digital strategy, and will allow KAR to focus on its portfolio of industry leading digital marketplaces. Proceeds of the transaction will be utilized to reduce KAR's corporate debt.

"KAR has always been a leader in the digital transformation of remarketing, and this transaction firmly positions us as the premier digital marketplace provider for wholesale used vehicles," said Peter Kelly, chief

executive officer of KAR Global. "While off-premise sales have increased over the past decade and represent over 50 percent of our vehicle sales today, we believe we are still in the early stages of this industry evolution, and the trends are rapidly gaining momentum. Digital marketplaces provide low cost, highly efficient venues for our sellers and buyers to transact, and our leading digital brands, platforms and technology position us well to grow as digital penetration increases. This transaction will allow us to focus our investments and energy on those higher growth, higher margin digital marketplaces and on delivering the most strategic solutions to our customers. By simplifying our business, we are better positioned to lead and win in the fastest growing segments of this industry."

Under the agreement, KAR will serve as a technology partner to Carvana, supporting the Adesa.com digital marketplace and the Simulcast and Simulcast+ technology that powers in-lane virtual sales for Adesa and the majority of independent auctions today. KAR will continue to operate its Openlane platform that supports more than 40 private label programs representing approximately 80 percent

of North America's off-lease inventory. KAR will also continue operating its rapidly growing digital dealer-to-dealer businesses — BacklotCars and CARWAVE in the U.S. and TradeRev in Canada — all of which experienced double-digit growth in 2021. In addition, the company will retain its Adesa Canada, Adesa U.K. and Adesa Europe businesses as well as its affiliated inspections, transportation and other services brands, including leading floorplan solutions provider AFC.

Approximately 4,500 current Adesa and KAR employees will transition to Carvana at the closing of the transaction. This will include all field personnel supporting the Adesa U.S. vehicle logistics centers as well as corporate employees and select senior and executive leaders who are primarily focused on the Adesa U.S. physical auction business.

The transaction is subject to customary closing conditions, and is expected to close in the second quarter of 2022, with the 30 day waiting period under the HSR Act having expired on February 23, 2022. The transaction has been approved by the boards of directors of both KAR and Carvana.

SALVAGING Millions

by Ron Sturgeon
Autosalvageconsultant.com

Are your employees sharing teeth?

Three old men are at dinner. They have a splendid meal – steaks, baked potatoes and veggies. But they have a problem. They have only one set of teeth. It's going to take them a while to eat. I'll let you imagine whether they share a little at a time or one finishes before passing the teeth on. Gross, I know.

Sharing teeth is not efficient. It creates a bottleneck at the dinner table. How many of your employees are sharing teeth? In the recycling industry, we tend to be cheap because we're boot strappers. And many of us have had little training in decoding the financial and operating metrics that could show the costs of sharing teeth. Couple that with our aversion to debt, and it's easy to see why many of us have employees sharing teeth.

How can this help you make more money?

When I was an auto recycler, we shared teeth for a long time. For years, we had three dismantlers and one forklift. The dismantlers always wanted another forklift. They often waited for 30 minutes or more because the forklift was tied up unloading a transport truck or doing other duties. While they waited, they would divert their efforts to a lower productivity task or just take a break.

They had asked for the forklift and I had dismissed their request as whining. Eventually, however, I listened, and I studied how long they waited to use the forklift.

I asked them to tell me how many additional cars they could process per week with a second forklift. When I reconciled their numbers against how many minutes were lost per day per employee, buying another forklift was an easy decision. The forklift decision was good because we could dismantle

the extra cars using our existing bays more efficiently since we could not add any more.

Doing this exercise with my employees and considering how a second forklift might alter the other metrics of my business is part of doing bottom-up budgeting. (Learn more about bottom-up budgeting in an upcoming article here.)

I used the same method when we were struggling to hit sales targets. Using bottom-up budgeting helped me see that sales growth required hitting delivery targets. Eventually, we realized we needed another truck. Later we improved per driver deliveries by changing compensation from hourly to pay per stop. After these changes, our dismantlers and drivers made more money, and we earned a higher return on assets.

Understanding metrics and changing my employee compensation plan helped my business grow at the expense of my local competitors. Where did I learn to use metrics and get the pay per stop idea? I belonged to a group of auto recyclers that met twice a year to compare metrics and discuss successful business growth techniques specific to our industry. One of the other members had much better metrics for per driver deliveries than the rest of us. He shared the idea with the group, and I made a lot of money applying it.

If your business could benefit from fresh ideas to lower costs, raise revenues, and increase profits, join a peer benchmarking review group for recyclers. You will share metrics with recyclers from other markets and learn how the person with the best results for each metric is achieving those better results.

Bob: "Holy schmoozes, I just fell off a 30' ladder."

Jim: "No way man, are you okay?"

Bob: "Yeah, luckily I was just on the first step."

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This article was provided by autosalvageconsultant.com, which was formed in 2001 by recyclers for recyclers, to help them improve their businesses.

PLASTICS

Republic Services develops plans for nation's first integrated plastics recycling facility in Las Vegas

Republic Services, Inc. unveiled development plans for the nation's first integrated plastics recycling facility, which will directly address increasing demand from consumer brands and packaging manufacturers for recycled plastic, enabling greater circularity. The Republic Services Polymer Center represents the first time a U.S. company will manage the plastics stream through an integrated process from curbside collection of recycled material to production and delivery of high quality recycled content for consumer packaging.

"Packaged goods manufacturers have set ambitious targets to use more post-consumer content in their products, but the current supply of recycled plastics falls short. The Republic Services Polymer Center will help meet the increasing demand for a reliable, high-

quality supply of recycled plastics, assisting brands in achieving their sustainability goals," said Jon Vander Ark, president and chief executive officer. "This is a critical step forward in solving the plastics circularity challenge. As a leader in the environmental services industry and one of the nation's largest recyclers, Republic is uniquely positioned to support the circular economy."

Today in the U.S., only about 30 percent of single use plastic bottles and jugs are recycled. Even when these plastics are placed in the recycling bin, their lifecycle is not always circular. Instead of being recycled back into consumer packaging, these plastics often are downcycled into products such as textiles or carpet, or to industrial uses like construction pipe, which have few options for further recycling.

Brands continue to make voluntary sustainability pledges to increase the use of recycled content in consumer packaging, while states such as California and Washington are requiring the use of recycled content in single-use plastic containers. Despite this growing demand, there is not enough high quality recycled plastic for manufacturers to use in consumer packaging. The Polymer Center will help bridge the gap between curbside collections and manufacturers' needs, providing a reliable supply of domestically sourced recycled plastics for use in food-grade and other consumer packaging.

Rigid plastics collected from residential and commercial customers and sorted at local recycling facilities will be delivered to the Polymer Center for processing, including shredding and hot washing or sorting by color. The

facility is expected to produce more than 100 million pounds per year of recycled plastic products, including 100 percent post-consumer PET flake delivered to the food-grade marketplace to enable bottle-to-bottle circularity. In addition, HDPE and PP packaging such as detergent jugs, which today are collected in multicolored bundles, can be separated by plastic type and color, allowing, for example, an orange jug to be recycled into another orange jug.

The first Polymer Center, opening in Las Vegas in 2023, will process plastics from Republic's recycling facilities in the west, where legislation is driving increased demand for recycled content. Republic anticipates opening two to three more centers to provide national coverage and further drive circularity.

Kraft Heinz agrees to set virgin plastic reduction goal

The Kraft Heinz Co., the third-largest food and beverage company in North America, has agreed to set a goal to reduce total virgin plastic use following the filing of a shareholder proposal and engagement with As You Sow.

The proposal asked Kraft Heinz to report on how the company would reduce plastic packaging, including

planned strategies, materials redesign and reductions in use of virgin plastic.

The company intends to set a substantial virgin plastic packaging reduction goal, the company informed As You Sow in a statement. In response, As You Sow agreed to withdraw its shareholder proposal. Kraft Heinz's commitment continues a steady stream of major U.S.

brands and retailers who have agreed to cut virgin plastic use after interaction with As You Sow.

"We were pleased to reach this agreement with Kraft Heinz that involves a substantial virgin plastic reduction goal for packaging including consideration of packaging redesign and innovative reuse models," said Conrad

MacKerron, senior vice president at As You Sow.

The largest cut in overall plastic use to date by a major consumer goods company was a 2019 commitment by Unilever to cut virgin plastic use by 50 percent, including a total elimination of 100,000 tons of plastic packaging by 2025.

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BRIEFS

NWRA expands government relations team

■ The National Waste & Recycling Association (NWRA) has hired Lewis Dubuque as vice president, chapter management, managing government affairs and chapter activities in nine states.

Dubuque will have responsibility for chapters in New York, New Jersey, Pennsylvania, Massachusetts, Rhode Island, Connecticut, New Hampshire, Vermont, and Maine. He led the New York State Builders Association (NYSBA) for the last 11 years before this position.

During his time at NYSBA, Dubuque advocated on behalf of the residential construction industry at the State Capitol in Albany, pushing back against harmful laws and regulations that could have a devastating impact on affordable housing in New York.

Schupan acquires Mid America Recycling

■ Schupan and Sons, Inc., a materials recycler, processor, distributor and manufacturer, has acquired Des Moines, Iowa based Mid America Recycling.

“Mid America Recycling’s multi-material recycling and deposit container operations align perfectly with being an industry leader in providing sustainable, high-quality, recycled materials,” said Tom Emmerich, Schupan, chief operating officer. “Mid America has been a recycling leader in Iowa for years, and has a knowledgeable team with strong customer relationships. We’re a really good fit.”

Nationally recognized for its efficient Michigan deposit container processing system, the acquisition of Mid America Recycling also aligns with Schupan’s strategic growth plans, domestically and abroad.

Harris expands its Cordele, Georgia machine shop

■ With continued growth in customer demand for their machinery, Harris, a division of Avis Industrial, has announced the expansion of the company’s advanced machine shop in Cordele, Georgia.

The expansion encompasses the construction of a new machine building, adjacent to the current machine shop, with over 14,000 sq.ft. of new production and training space. The expanded capacity will be home to CNC machining centers for turning, milling, drilling, and shaping, will provide a state-of-the-art environment for the machinists plying their trade, and allow for central meeting and training space for the nearly 150 employees on the Cordele campus.

Harris’ Cordele manufacturing complex is a 130 year old, 22 acre facility served by direct rail access. It encompasses facilities for fabricating, machining, cylinder manufacturing and assembly of Harris’ largest balers and shears as well as the Harris TransPak units.



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Challenges continue to grow as the EV battery recycling market advances

by MAURA KELLER

mkeller@americanrecycler.com

Open any news website and you'd be hard pressed not to find information on the growth of the electric vehicle marketplace. With that growth, recyclers' attention is increasingly focused on the eventual influx of the lithium-ion batteries used within these vehicles, including new recycling facilities, legislative issues and challenges that come with this new technology.

According to the International Energy Agency, in 2020, the sales of electric and hybrid vehicles reached 3 million vehicles in major markets including North America, China and Europe, equating to 4.6 percent of total sales. In Europe, the EV market share reached 10 percent of sales. And as more and more automotive manufacturers are moving to eliminate the internal combustion engine and embrace EV technology, a report by BloombergNEF stated that auto manufacturers are predicting more than 40 million electric vehicle sales by 2040. With that comes a growing focus on EV battery recycling.

According to Steve Christensen, executive director of Responsible Battery Coalition (RBC), a coalition of companies, academics and organizations committed to the responsible management of the batteries, several states, including Nevada, have led the way in welcoming and supporting new recycling facilities. While the American Battery Technology Company raised \$39.1 million for a new Nevada

facility, Li-Cycle received a \$100 million investment from Koch Strategic Platforms for new EV battery recycling centers in North America. Battery Resourcers recently opened North America's largest lithium-ion battery recycling mega center in Georgia.

As states are welcoming new EV battery recycling facilities, at the federal level, an infrastructure law will allocate almost \$7 billion for strengthening the battery supply chain in the U.S., including recycling battery materials. In 2020 and 2021, a Senate bill for lithium-ion recycling was proposed and another bill funding infrastructure investment was passed by Congress in 2021. While the law does not mandate electric vehicle battery recycling, it provides \$60 million for research into battery recycling (including researching the reuse of electric vehicle batteries) and it allocates \$50 million for local governments and \$15 million to retailers to fund battery recycling programs.

"The legislative proposals that we are monitoring include provisions such as critical mineral sourcing and the processing and use of recycled content in new batteries," Christensen said.

In addition, as Lea Malloy, head of EV Battery Solutions at Cox Automotive Mobility explained, there currently is significant money flowing to EV battery recycling start-ups, underscoring the environmental necessity of such technologies, as well as the consumer and corporate expectations around lifecycle management.



Recovery of cobalt is imperative as it's considered the highest material supply chain risk for electric vehicles (EVs) in the future.

PHOTO COURTESY OF THE U.S. OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY

Malloy said legislators shouldn't focus on domestic EV battery recycling as means to an end, but instead, strategically manage the commodities that are vital to pushing NA-ion battery production forward by keeping cobalt and nickel within the existing supply chain.

"We would also advise for cohesive federal standards around EV battery recycling and environmental permitting," Malloy said. "Unfortunately, we're seeing the interpretation and extension of policies developed to support other industries, like lead acid batteries, complicating decisions for EV batteries."

Challenges Aplenty

Ryan Melsert is the chief executive officer of American Battery Technology Company, which has built a clean technology platform used to provide a key source of

domestically manufactured, critical and strategic battery metals to help meet the demand from the electric vehicle, electrical grid storage, and consumer electronics industries.

Melsert said it is crucial to recover precious metals, like the critical materials that fuel electric vehicles and consumer electronic batteries, for many reasons. Most importantly, recovery through recycling allows for a more circular economy for those metals, and allows them to have a perpetual, circular life cycle. "Recycling also keeps the products made up of such materials out of landfills, where they can pose a significant risk to the environment," Melsert said.

There are various methods used to recover metals through recycling. As Melsert explained, some high heat or pyrometallurgical methods are

less favorable for the environment, as they can create harmful air emissions and they don't recover all of the available metals. And some conventional hydrometallurgical methods use large amounts of acids and other chemicals.

"We favor a phased mechanical and targeted hydrometallurgical process. Our closed loop process allows us to recover high purity lithium, nickel, cobalt, manganese, aluminum, copper, and plastic that can be redeployed into the battery metals and commodity supply chains," Melsert said. "It is economically and environmentally sustainable while providing a truly circular economy for these materials."

That said, the EV recycling process is not without its set of challenges. Malloy said the largest concern

See BATTERIES, Page B6



1962 - 2022

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Market study sets global electronics recycling market to reach \$65.8 billion by 2026

A new market study published by Global Industry Analysts Inc., (GIA) a market research company, released its report titled “Electronics Recycling – Global Market Trajectory & Analytics”. The report presents fresh perspectives on opportunities and challenges in a significantly transformed post COVID-19 marketplace.

In recent years, e-waste volumes have been rising at an alarming pace owing to the unprecedented consumption of electrical and electronic equipment globally. This has forced manufacturers, retailers and distributors to look for novel business models, increasing focus on circular electronics as the means for allowing manufacturers to develop and promote the use of refurbished and recycled electrical and electronic products. In addition, governments can also play a vital role in the effective and efficient management of e-waste through implementation of strict policies, such as extended producer responsibility (EPR). There is also an increased need for replacing traditional manual methods of handling, sorting, burning and incinerating e-waste with modern advanced technologies, such as Industrial Internet of Things (IIoT), automation and robotics.

Electronics recycling is set to experience increasing attention across countries as a result of rising electronic waste or e-waste. The future of electronics recycling is anticipated to be significantly influenced by ongoing

changes such as technological advancements and consumer inclination towards advanced products. That trend is shortening the replacement cycle and generating significant volumes of electronic waste. Recycling technology depends heavily on a number of aspects like manufacturing approaches, purchasing behavior and use of electronics. The e-waste recycling industry will likely gain from rising environmental concerns and the need to recover precious metals from e-waste. Other key factors driving the market include favorable government guidelines and regulations for managing e-waste and recycling programs globally; increasing disposable income and purchasing power of people leading to increased spending on varied electronic consumer products; and increasing affordability of consumer electronic devices. The increasing adoption of electronics recycling to refurbish functional components and high-value materials that can be reused in products is expected to drive market growth.

Amid the COVID-19 crisis, the global market for electronics recycling estimated at \$39.7 billion in the year 2022, is projected to reach a revised size of \$65.8 billion by 2026, growing at a CAGR of 12.7 percent over the analysis period. Metal, one of the segments analyzed in the report, is projected to grow at a 13.3 percent CAGR to reach \$53.6 billion by the end of the analysis period. After a thorough analy-

sis of the business implications of the pandemic and following economic crisis, growth in the plastics segment is readjusted to a revised 11.5 percent CAGR for the next 7 year period. This segment currently accounts for a 24.6 percent share of the global electronics recycling market. Recycling of plastic products has tremendous potential to reduce the footprint of plastic.

PET is among the most widely used recycled plastics and accounts for most of soda and water bottles. It can be converted to various types of products from automotive parts to polyester fabrics.

The electronics recycling market in the U.S. is estimated at \$8 billion in the year 2022. The U.S. currently accounts for a 21.72 percent share in the global market. China, the world’s second largest economy, is forecast to reach an estimated market size of \$15.3 billion in the year 2026, trailing a CAGR of 16.3 percent through the analysis period. Among the other noteworthy geographic markets are Japan and Canada and each will likely grow at 8.9 percent and 9 percent respectively over the analysis period. Within Europe, Germany is forecast to grow at approximately 12.5 percent CAGR while the rest of the European market (as defined in the study) will reach \$6.1 billion by the end of the analysis period. Europe is expected to account for a maximum share in the electronic waste recycle market and retain its leadership position, owing to fast growth and implementation of e-waste recycling solutions, software, systems, and platforms in various industry verticals,

including security, automotive, marketing, healthcare, retail, IT, communications, manufacturing and agriculture. Additionally, market growth in the region is propelled by increased adoption of e-waste recycling technologies pertaining to data mining, as well as image and speech recognition.

There are certain key business strategies that market participants would need to primarily focus on for encouraging sustainability and environmental safety and tapping growth opportunities in e-waste management. In the last decade, there has been a multifold increase in investments for the management of IT infrastructure. Such IT assets are increasingly raising a concern with them reaching the end of their life and requiring efficient recovery and recycling methods. Erasure of all data using software programs can make these IT assets ready for reuse within the enterprise. These assets can also be refurbished and sold to another enterprise, allowing companies to maintain compliance with data-related regulations as well as implement circular IT that allows reuse, recycling, and refurbishment of assets. With more enterprises migrating to cloud-based data centers, there is likely to be an increased focus on designing and developing IT asset disposal (ITAD) software programs for managing hyperscale data centers established by large technology companies globally. In addition, incorporating an efficient ‘track and trace’ feature to monitor products from manufacture to its consumption and

See GLOBAL MARKET, Page B7

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Former chief executive officer of recycling firm sentenced for tax fraud

The former owner and co-chief executive officer of an electronics recycling firm was sentenced in U.S. District Court in Seattle to six months in prison for tax fraud, announced U.S. Attorney Nick Brown. Jeffrey Zirkle, of Gig Harbor, Washington, was the owner and co-chief executive officer of Total Reclaim, the Northwest's largest recycler of electronic waste. In 2019, Zirkle was sentenced to 28 months in prison for defrauding clients by secretly exporting electronic waste to Hong Kong, despite presenting his business as an environmentally-friendly recycling service. This second criminal case stems from Zirkle using company funds to pay for his personal expenses and failing to report the transactions on his income tax returns.

At the sentencing hearing U.S. District Judge James L. Robart said, "He's been defrauding the company and defrauding the government for years. He has no respect for the law whatsoever." Judge Robart ordered Zirkle to pay \$125,549 in restitution to the government.

"Those who fail to pay their taxes are not just cheating the government, they are also stealing from taxpayers who are following the rules. But despite earning nearly \$1 million a year in salary, Mr. Zirkle refused to pay his fair share," said U.S. Attorney Nick Brown. "At the same time that he was misleading customers about his company's business practices, he was also lying to the IRS by mischaracterizing his personal expenses as business expenses. No one is above the law."

According to records filed in the case, following the prosecution of Zirkle and his partner for fraud, a new chief executive officer took over Total Reclaim. That executive discovered Zirkle had embezzled from the company by charging hundreds of thousands of dollars in personal expenses on company credit cards. An investigation by the FBI and IRS(CI) determined that as much as \$480,000 were for personal items and that Zirkle never reported those benefits on his income tax returns.

In October 2021, Zirkle pleaded guilty to filing false tax returns from 2008 to 2017. Zirkle negotiated a settlement with Total Reclaim regarding the expenses. Zirkle was ordered to pay \$125,549 in restitution for the tax loss.

In the earlier criminal case, an EPA investigation concluded that Total Reclaim had secretly exported over eight million pounds of monitors containing toxic materials such as mercury. The investigation revealed that Zirkle and his co-defendant had concealed this practice by submitting fraudulent documents to auditors and customers, and had falsified more documents when the practice was discovered.

Due to concern about the pandemic, Judge Robart ordered Zirkle to begin serving his sentence in early August. Over the objections of the prosecutor, Zirkle asked for the delay in serving his time, so he could attend two family weddings. Zirkle will be on 18 months of supervised release for the tax crimes following his prison term.

Igneo expands operations

As the success of its France-based e-waste recycling facility continues to establish the company as a leader in European markets, Igneo is ready to expand operations closer to home.

Igneo, an electronics recycling company that produces high grade, sustainable, clean copper concentrate from discarded low grade consumer elec-

tronics, is preparing to expand its operations in Savannah, Georgia by the fourth quarter of 2023. The company claims the new facility on the southeast coast will produce 120,000 metric tons of renewable and recyclable copper concentrate, and will out produce its French plant, which currently produces 90,000 metric tons each year.

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EQUIPMENT SPOTLIGHT

Size Reduction

by **MARY M. THORNTON**

maryt@americanrecycler.com

The world e-scrap recycling market was worth 50 million metric tons in 2019 and is expected to witness a CAGR of 3.1 percent through 2030, per GlobalNewswire. Growth has been fueled through continuous technology development in electronic devices and adoption of advanced or next generation devices. The e-scrap recycling industry strives to address rising environmental concerns and efficiently manage the rising volume of electronic waste. Proliferation of IoT and integration of technology updates to existing devices will continue to generate a high volume of e-scrap in coming years. There are many companies that manufacture the equipment needed to process e-waste, as mentioned below.

Allegheny e-scrap shredders provide the ability to turn an environmental and security issue into a practical solution. "Our versatile, industrial shredder is a reliable, cost-effective machine for destroying unwanted hard drives, digital media, televisions, bound books, office equipment, appliances and more. As a rugged, high

capacity shredder, it can crush and shred products and materials into unusable and unidentifiable pieces," stated Joe Barusch, sales and marketing director.

Two separate shredder shafts driven by different horsepower motors provide significant speed and crushing power, as well as a practical, cost-effective first step in recapturing valuable metals. Allegheny's three models of the product and e-scrap shredder are the 3025DX, 3650DX, and 52125DX and specialized features include dual crusher and cutters, designed for handling bulk reduction. This reliable and secure destruction solves the problem of potential security risk or revenue loss inherent in obsolete materials. Waste stream reduction of electronics and products increases overall recycling and benefits the environment.

Barusch concluded, "Allegheny shredders thoroughly destroy items – from cell phones to copy machines, which helps prevent security breaches, product liability and re-selling of contraband materials. The global increase in the amount of obsolete or damaged products generated and a flood of discarded electronic devices cause problems such as security risk, product liability and revenue loss. Our experience allows us to build a custom industrial shredder system based on the products you want to destroy."

M&J Recycling specializes in the design and manufacture of heavy duty shredding equipment for every segment of the recycling industry. "Through more than 1,000 installations worldwide and a focused approach on relentless R&D, M&J Recycling is one of the world's leading shredder suppliers. Our shredder line is so versatile, we offer products that are as well-suited to e-scrap as they are to recycling streams that encompass metals and plastics scrap. M&J Recycling's shredding technology is based on true and tested knife designs and open cutting tables that are the industry standard. The distinct technical advantages ensure our shredders provide consistent performance, low downtime, and



Shred-Tech

reduced 'cost per ton' processing variables," commented Lou Martins, general sales manager, Americas.

He added, "In today's environment, one constant is the fact that streams are continuously changing. An M&J shredder is built to worst case scenario conditions. So, as streams change due to fluctuating business demands or changes in the operating environment, our shredders can handle the most challenging of streams, right out of the box. All M&J pre-shred units feature a modular design approach built from industry leading components, to meet your specific application and shredding performance needs. For low volume applications that previously might not have justified the cost of a shredder purchase, our K-Series shredders are a perfect solution."

M&J Shredder features include: an open cutting table, which reduces wear on the cutting table area; bi-directional shredding, which results in a consistent flow to feed downstream processes; asynchronous shredding, which keeps waste constantly moving, improves shredding efficiency and eliminates wrapping and bridging; a central lubricating system, standard on all machines; a power pack and cutting table that can be mounted separately, providing design flexibility and blocking contaminants from delicate components; automatic reversal, a safety feature that provides strength without self-destruction; intelligent shredding "recipes" that automatically adapt to

See **SIZE REDUCTION**, Page B7

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See **SIZE REDUCTION**, Page B7



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Electronics industry leaders applauded for recycling

The U.S. Environmental Protection Agency (EPA) recognized contributions in sustainable design and electronics recycling as part of the 8th annual Sustainable Materials Management (SMM) Electronic Challenge awards.

“It’s going to take all of us working together to build a sustainable future, and I applaud the organizations recognized for their leadership in essential electronic recycling efforts,” said EPA Administrator Michael S. Regan. “Electronics are a global economic driver with supply chains that reach around the world and products that play a big role in our daily lives. Because of these organizations’ efforts, we’re able to recover and recycle valuable resources.”

EPA SMM Electronics Challenge Gold Tier Award

EPA’s Gold Tier Award is presented to organizations with exemplary electronics collection and recycling programs. The 2021 recipients are:

- Dell Technologies (Texas)
- LG Electronics USA, Inc. (New Jersey)
- Samsung Electronics (New Jersey)
- Sony Electronics, Inc. (California)
- Staples (Massachusetts)
- TCL North America (California)
- T-Mobile (Washington)
- VIZIO, Inc. (California)
- Xerox Corporation (New York)

EPA SMM Electronics Challenge Champion Award

EPA also honored LG Electronics USA, Inc. and Dell Technologies as the SMM Electronics Challenge Champion Award winners for exemplifying leadership and innovative processes and products that focus on environmental responsibility.

•Dell is receiving the Cutting-Edge Award for setting a goal of creating more than half of their product content from recycled or renewable materials by 2030.

•LG is receiving the Product Award this year for developing LG Sound Bars composed of recycled materials, created with a focus on reducing environmental impact in every phase of the life cycle.

EPA SMM Electronics Sustained Excellence Award

New this year, EPA launched an award for cutting-edge innovations that demonstrated sustained excellence since the program launched in 2012.

•Dell Technologies received this award for their circular design approach to sourcing aluminum for hard drives.

•EPA also presented this award to Samsung Electronics for creating a solar powered remote control composed of 24 percent recycled material.

Overall, challenge participants collectively diverted over 158,000 tons of electronics from landfills, 100 percent of which was sent to recyclers and avoided the equivalent of 430,000 tons of carbon dioxide emissions.

Reebelo raises \$20 million to create platform for reuse of electronic devices

Reebelo, APAC’s fastest growing marketplace for affordable, sustainable tech devices, has raised a \$20 million Series A funding round, led by Cathay Innovation and June Fund. Other participants included FJ Labs, KREAM (an affiliate of Naver), Moore Strategic Ventures, French Partners and Gandel Invest. Existing investors participating in the round include Antler, Maximilian Bittner (co-founder Lazada, chief executive officer, Vestiaire Collective), Michael Cassau (founder and chief executive officer Grover) and others.

Founded in 2019 by Philip Franta and Fabien Rastouil, Reebelo seeks to become the most trusted platform for buying pre-owned electronic devices. In less than two years, Reebelo has grown revenues 600 percent YoY, surpassed 10,000 monthly customers, is heading toward \$100M in annualized GMV at a rapid pace, and is now operating offices in Australia, Singapore, New Zealand, Hong Kong, Malaysia and Taiwan.

The new funding round will be used to hire over 50 team members as well as expanding into more markets in 2022.

On Reebelo, consumers can save up to 70 percent on their favorite tech gadgets. All pre-loved devices – such as phones, laptops, drones or gaming hardware – get refurbished and go through 40 plus checkpoints before being listed on the marketplace. By partnering with more than 100 certified vendors,

Reebelo offers the largest inventory for certified pre-owned tech in its markets.

“We believe in a future where everyone has access to affordable electronics, consumed in a more sustainable way”, said Philip Franta, founder and chief executive officer at Reebelo. “When consumers become part of Reebelo’s circular economy, they save money and help the planet.”

Electronic devices are among the most expensive purchases for consumers – and they get replaced frequently. In addition to the high costs for customers, e-waste is one of the fastest growing waste streams globally. Reebelo’s mission is to refresh the way tech is consumed by making device consumption affordable, sustainable and delivered through a platform built on sustainable values and quality-assured devices.

“Innovation and startups like Reebelo are key components in the transition towards a more sustainable economy and world,” said Rajive Keshup investment director Cathay Innovation. “Reebelo is providing a platform and marketplace for consumers that makes it easier for anyone to obtain electronic goods, all while helping to solve the problem of e-waste. The company is providing a pivotal platform for the circular economy in Southeast Asia and Australia, and we look forward to helping foster their expansion and growth.”



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Batteries

■Continued from Page B1

surrounding EV battery recycling and handling is the costs associated with the safe handling of packs on the road while in transport, due to U.S. Department of Transportation restrictions.

"The packs are heavy, and the bulk dunnage is sparse. It's difficult to fill a load with 40,000 pounds of batteries and ensure it makes it to the destination without damage," Malloy said. Additionally, the industry faces challenges in access to battery health data to make the proper assessments about end-of-life status.

According to Christensen, the lack of a truly circular economy is another issue facing the electric vehicle (EV) battery recycling industry.

"With a circular economy, you have more stability and predictability in your business allowing for better long term planning," Christensen said. "This results in higher recycling rates, cost savings across the value chain and less pressure on sourcing new materials. Ultimately, proper planning for a circular economy lowers the overall emissions associated with the batteries."

As Christensen explained, recyclability relies significantly on the value of the materials in the battery and the energy, time and cost needed to recover those materials. As such, RBC has found through the organization's own work with the ReCell Center at Argonne National Laboratory that the business case for recycling an EV battery becomes weaker as the materials become less desirable or more costly to extract.

"Our research shows that there is a balance that needs to be struck between these factors in order to create a sustainable business model for recycling every battery," Christensen said. "This is where collaboration with battery manufacturers, EV OEMs and recyclers is critical. Together these different actors in the battery's lifecycle can ensure it is properly managed."

Indeed, Melsert said innovation and improvements in the manufacturing of lithium-ion batteries will ultimately pave the way for more efficient recycling processes to recover the criti-

cal materials from those batteries when they reach their initial end of service.

"Our de-manufacturing recycling process utilizes a first-principles approach to comprehensively and sustainably target contaminants, remove impurities, recover and purify metals to purify to battery grade specifications," Melsert said. "In essence, with our recycling process, there is no 'end of life' for batteries, but rather a circular and perpetual life cycle."

Staying Informed

Christensen advised recyclers to keep an eye on emerging technologies that lower the emissions associated with recycling EV batteries. "Some estimates say that more than 11 million metric tons of lithium-ion batteries will reach the end of their service life by 2030. If these batteries are all recycled using the zero-emissions technologies pioneered by RBC members, it will result in a massive reduction in greenhouse gas emissions," Christensen said.

Information about how a battery was manufactured, and its component "ingredients," will be key for responsible end-of-life management. Christensen said the more a recycler knows about a battery, the more efficiently it can be managed at the end of its life. RBC is working with its partners at the Global Battery Alliance in creating what is called the Battery Passport.

"This will be easily accessible, readable information that is collected and follows the battery throughout its life," Christensen said. "At the end of the battery's life, the recycler will have all the necessary information to make the best decisions on how to manage the battery."

The team at Cox Automotive Mobility believes EVs are the future to drive a safer and more environmentally friendly mode of transportation.

"That said, we are solving one of the biggest environmental challenges of our time, and we do expect to experience peaks and valleys along the course," Malloy said. "Without a doubt, EV battery recycling is an environmental and economic necessity, and the industry is driving innovation. However, the industry will need the flexibility and agility to pivot as we build out the EV battery service lifecycle together."

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Oregon DEQ to close e-waste sites to cut costs

One of Lincoln County, Oregon's, three disposal services lost its ability to accept electronic waste for recycling after management learned it had been cut from a statewide program due to lack of funding, as reported by Newport News Times.

Starting March 1, Dahl Disposal in Toledo and several other rural sanitary service providers across Oregon ended being a part of the Oregon Department of Environmental Quality's E-Cycles electronics recycling program. The change is reportedly part of a cost cutting measure unexpectedly announced by the DEQ's recycling contractors late last November.

The E-Cycles program was introduced in 2010 alongside a state law that

prohibits many common electronics from being disposed of in a landfill with regular waste. Such items include TVs, computer monitors, computer towers, printers and most computer accessories, such as mice and keyboards.

Those items are instead required to be recycled mainly through the E-Cycles program, which was created partly to increase access to recycling services across the state, especially in rural areas.

"The reason this was passed in the first place was so rural access points could help take care of the whole state of Oregon," Rob Thompson, owner of Thompson Sanitary, said. "This move by the DEQ now is diminishing that,

one of the building blocks of the original legislation."

Late last November, Dahl was contacted by the National Center for Electronics Recycling (NCER), the DEQ-approved recycling contractor it has worked with since 2018, and was notified its contract would be canceled, effective December 31, with services effectively ending on March 1.

NCER told Dahl the cancellation was to make up the difference in tonnage it was funded for by the DEQ and the tonnage it was actually receiving, which was higher than estimated, the last few years.

According to a written statement by Joe Cook, general manager at Dahl, the DEQ allots funding for the E-

Cycles program based on a projection of the next year's recycling collection goals. Goals are set each year and funding goes to the state's recycling contractors to reimburse them for the amount of recycling they receive throughout the year.

For the last three years, however, the DEQ has underestimated the amount of recycling that would be received statewide, and so the funds it allotted to reimburse its contractors have fallen short, according to Cook. With goals already set for 2022 and another shortfall predicted, contractors like NCER are now looking for ways to match those tonnage estimates and are shutting down lower intake recycling sites like Dahl.

Global market

■Continued from Page B2

disposal, would offer enhanced visibility and transparency. This would also facilitate efforts taken by governments, manufacturers, and recyclers in tracking e-waste. Incorporation of digital passports would provide all relevant data related to component and material characteristics along with recycling processes for enabling efficient product's use, recovery, reuse and recycling at the lifecycle end. Digital passports, such as those driven by digital twin technology, which refers to a virtual and digitized representation of real-world products or processes. This trend will contribute significantly towards driving a circular economy in electrical and electronic equipment in the coming years.

The insatiable desire for electronic devices and mushrooming streams of next-generation items, from smartphones and smart TVs to refrigerators and displays, has resulted in burgeoning volumes of e-waste. The surge in demand for consumer electronics and the rising amount of e-waste are

poised to highlight the need for recyclers. Another factor that likely will help the industry is growing security and privacy concerns. With important data stored in smartphones, laptops, tablets or other electronic devices, various consumers are reluctant to discard them without wiping out the information.

These concerns are driving a large number of customers to recycling service providers to collect their devices and securely wipe out the data. In the global consumer electronics (equipment type) segment, U.S., Canada, Japan, China and Europe will drive the 12 percent CAGR estimated for this segment. These regional markets, accounting for a combined market size of \$14.5 billion, will reach a projected size of \$35.4 billion by the close of the analysis period. China will remain among the fastest growing in this cluster of regional markets. Led by countries such as Australia, India and South Korea, the Asia-Pacific market is forecast to reach \$5.8 billion by the year 2026, while Latin America will expand at a 16.2 percent CAGR through the analysis period.

Size reduction

■Continued from Page B4

processed material characteristics; and Hardox steel used in all parts of the cutting table, shaft and knives.

Shred-Tech manufactures dual chamber data bearing device shredders to assist in the secure destruction of e-waste and small electronics. The dual chamber data bearing device shredder contains two shredding chambers that can shred smaller, solid state drives and larger hard drives. This shredder is available as a portable plug-in unit, stationary unit or it can be added onto any Shred-Tech shredding truck. The machine can range from 3 to 10 hp, depending on the type of shredder chosen, with throughputs ranging from 600 to 1000 drives per hour. These shredders are specifically designed to destroy data drives so that the info they contain can never be retrieved or

reconstructed.

"The metals and plastics in computers and electronic devices are quite easy to reduce now, but components such as solid state hard drives are especially small and may not be destroyed thoroughly, by the knives in traditional shredders. To ensure that confidential data stored on small digital devices is destroyed requires a shredding machine that can process equipment into extremely small particles. Shred-Tech offers such products and we continue to be innovative and competitive as we meet customer demands. With over 500 units sold annually, our organization has the largest global footprint of all specialty shredding equipment manufacturers," explained Stefin Sobel, processing sales manager.

When a guy says he likes girls with a sense of humor, he doesn't mean that he wants a girl to be really witty. He means he wants her to laugh at his jokes.

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