



# American Recycler

NewsVoice of Salvage, Waste and Recycling

AmericanRecycler.com

## FOCUS: Waste

# Waste-to-energy capacity declines

### Handling waste from metal recycling



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Covanta's waste-to-energy facilities are designed to convert remaining waste after recycling by combusting it – generating steam for electricity production. Leftover ash is then processed to recover metal for recycling while all gases are collected, filtered and cleaned to minimize environmental impact. PHOTO COURTESY OF COVANTA

by MAURA KELLER

[mkeller@americanrecycler.com](mailto:mkeller@americanrecycler.com)

According to the U.S. Energy Information Administration (EIA), for every 100 pounds of municipal solid waste (MSW) in the U.S., about 85 pounds can be burned as fuel to generate electricity. This waste-to-energy (WTE) process is gaining momentum as the impact of WTE plants means that 2,000 pounds of MSW can be reduced to 300 to 600 pounds of ash, reducing the volume of waste by 87 percent.

WTE plants account for a relatively small portion of U.S. electric generating capacity (mainly concentrated in the Northeast and in Florida), primarily due to the significant upfront capital costs of building WTE combustion plants. As a result, in August 2022, the EIA released an update to the U.S. waste-to-energy electric generating capacity indicating that for the first time in 24 years, the capacity has started to decline. This is primarily due to lower electricity prices, policy concerns about WTE plant emissions and local opposition.

Brent Trenga, director of sustainability for Kingspan Panels North America has been at the helm of waste-to-energy programs, as well as programs to divert waste-to-landfill for all of Kingspan's North America manufacturing sites.

"We are seeing the effects of climate change daily – more major hurricanes, brutal wildfires and severe flooding. As the problem gets harder to ignore, more companies are looking inward to see how they can reduce their impact on the planet," Trenga said.

"Companies will realize that waste-to-energy can be the first step in reducing the volume of material going to landfill."

Kingspan has embraced the waste-to-energy movement through the company's global Planet Passionate sustainability program, a multi-faceted strategy for reducing the company's environment input.

"Part of the program is to divert 100 percent of its waste from landfills by 2030. At our plant, mineral fiber waste accounts for nearly half the waste generated. It is now sent back to the supplier to make new products," Trenga said. The remaining waste from this facility has a short-term waste-to-energy program in place to ensure it does not end up in a landfill, and instead, creates an energy source that is cleaner than fossil fuels.

"This fills the gap until we can find alternative recycling streams for each of the materials collected," Trenga said.

Kim Bredahl, senior vice president at Babcock & Wilcox Renewable, pointed out that globally, there is considerable discussion of the circular economy and the role recycling and energy production play. Babcock & Wilcox is supporting efforts to help create a sustainable, circular economy utilizing the company's advanced waste-to-energy technologies to produce clean, low-emissions energy and support recycling.

"Waste-to-energy creates a beneficial use for waste that can't be recycled or that has reached the end of its recyclability," Bredahl said. "Our technolo-

gies, which uses waste as fuel to produce steam for power generation, heating and industrial processes, help divert waste from landfills and reduce net greenhouse gas emissions by eliminating the source of landfill methane, a potent greenhouse gas which is created when organic waste breaks down in a landfill."

The Kingspan WTE program is an example of a program that boasts extremely aggressive targets.

"Construction and demolition debris accounts for more than twice the municipal waste generated, according to the EPA," Trenga said. "As a building products manufacturer, we must find ways to reduce that material. Mineral fiber insulation is difficult to upcycle or recycle, which is why we need to work with the original supplier directly."

Kingspan is also seeking local partners at each of its five manufacturing sites who can incorporate the company's foam scrap into new products. Kingspan's global innovation team is actively working on chemically recycling the foam, so they are able to reclaim valuable raw materials back into their process.

"We are committed to finding ways to divert 100 percent of waste from landfills by 2030. The waste-to-energy program is a short term solution that allows our waste to stay out of landfills," Trenga said.

Bredahl added that one of the biggest drivers of demand for waste-to-energy, as well as the need for recycling, is population growth. Population

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## Small Town Access Fund launched for communities of less than 50,000

The Recycling Partnership recently marked the official launch of the Small Town Access Fund, a unique funding stream to support recycling programs in U.S. towns with populations of less than 50,000. Impact from seed funding is estimated to bring new or improved access and education to nearly 45,000 households in nine states, which will deliver more than 6 million pounds of new recyclables into the system and out of landfills per year.

According to The Partnership's Paying It Forward report, 4 in 10 single-family residents lack equitable recycling access – equating to more than 40 million people who do not have the same access to recycling service as they have to their trash service. Small and rural communities often face unique challenges when it comes to implementing and maintaining robust recycling programs. Common issues include lack of dedicated recycling staff, geographic challenges, including long distances from homes to materials recovery facilities, and financial limitations due to lower population density and the higher per-household collection costs that can be associated with smaller programs. Additionally, many small communities without curbside recycling systems rely on

drop-off locations for recycling, presenting a different set of education and maintenance issues than curbside access programs.

“We are thrilled to have a dedicated granting stream to assist smaller and rural communities in their efforts to provide residents with quality recycling access and education,” says Rob Taylor, senior director of grants and community development.

Supporting households in communities of all sizes leads to significant impact – an individual household generates an average of 767 pounds of recyclable material per year, and there are more than 18,000 incorporated municipalities in the U.S. with populations under 50,000. The Small Town Access Fund can help alleviate the specific challenges these communities face such as higher per-household collection costs and higher per-cart costs from purchasing equipment in smaller quantities.

The Small Town Access Fund was launched with a founding donation from L'Oréal USA, in partnership with GlobalGiving, with additional support from their Maybelline New York brand as well as Arconic Foundation. In its first year, the Fund is launching 14 projects in 9 states – Indiana, Massachusetts, Michigan, Minnesota, New Hampshire, New

Jersey, North Carolina, Ohio and Wisconsin – with several others in the pipeline for 2023 and beyond.

When funding is combined with additional grants or when recycling efforts in small communities are aligned with those in nearby towns, the resulting resources and scale can transform the recycling system regionally and potentially statewide. For example, The Partnership leveraged multiple cart grants in New Jersey – one of which was part of the Small Town Access Fund – along with a Partnership material coalition grant for expanded processing capacity to capture nearly 7 million new pounds of recyclables annually and ensure that programs in the region can successfully accept and process common recyclable materials.

In addition to material gains, recycling also delivers economic benefits to communities and residents – according to the EPA, 1.17 jobs are created for every ton of material recycled; over 600,000 people are directly employed by recycling in the U.S. today.

The Small Town Access Fund is a crucial component of The Recycling Partnership's long-term strategic objectives to transform the U.S. recycling system and activate a circular economy.

## Indian River County receives Florida environmental sustainability award

Recycle Florida Today, Inc., known as Florida's state recycling organization, has declared this year's Recycle Florida Today Environmental Sustainability award winner as Indian River County.

RFT came together to congratulate Indian River County as well as Collier County and Lee County as finalists, to showcase their outstanding Florida programs. The programs displayed an increased awareness of the importance of sustainability and ability to motivate others to maximize their recycling, composting, grass-roots efforts, waste reduction, sustainability efforts and improving their recycling rates through education, outreach and by example.

Sue Flak, recycling education and marketing coordinator for Indian River County, presented the community fridge program during the webinar and accepted the award. The Fellsmere Fridge is part of a new local pilot program called the Community Fridge Program, here a refrigerator is placed within a community and is used to share food at the neighborhood level. The motto of the program is, “Take what you need, Leave what you can.” The purpose of the program is to reduce food waste, build stronger communities, encourage local artists and promote equal access to healthy food.

The Fellsmere Fridge is maintained by a communal collective of partners. The volunteer organizations include the City of Fellsmere, Indian River County, the Sunrise Rotary, the Haller/Loja family, Cutting Edge Signs, United Against Poverty, the Treasure Coast Food Bank, the Boys and Girls Club of Fellsmere, Indian River Charter High School Interact Club, Heather Kramer/Luz De La Hoz, Marsh Landing, Lowe's of Vero Beach, Complete Electric and the first grade students of Fellsmere Elementary.

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# Capacity

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growth, coupled with increasing urbanization and the increasing affluence of people worldwide, results in more waste being produced.

“Governmental policies and legislation that focus on protecting the environment – particularly in Europe, parts of Asia and some regions in the U.S. – are incentivizing the use of waste-to-energy as a solution for waste and an alternative to landfills,” Bredahl said.

As the Kingspan WTE program illustrates, there are environmental and economic benefits to waste-to-energy. The environmental benefits include decreased reliance on landfills and a reduction in pollution (such as runoff) caused by landfills, as well as the elimination of landfill methane emissions.

“Methane emissions, according to the U.S. Department of Energy, is a greenhouse gas with 80 times the global warming potential (GWP) of carbon dioxide over a 20 year period,” Bredahl said. “Economically speaking, in some parts of the world where landfill space is limited, it is very expensive to bury waste. Waste-to-energy saves money by greatly reducing reliance on landfills and producing beneficial clean energy for the community.”

*A linguistics professor was lecturing his class. “In English,” he said, “a double negative forms a positive. However, in some languages, such as Russian, a double negative remains a negative. But there isn’t a single language, not one, in which a double positive can express a negative.”*

*A voice came from the back of the room: “Yeah, right.”*

## Embracing Challenges

Bredahl said one of the biggest challenges facing the WTE efforts is overcoming the misperceptions that abound about waste-to-energy. Of course, part of these misperceptions on the part of the general public, is a lack of understanding about what WTE is and how it can improve communities. In fact, in communities where waste-to-energy is coupled with recycling programs, the team at Babcock & Wilcox Renewable often see increased participation in recycling. Waste-to-energy also is clean, renewable energy.

“We’re turning unrecyclable waste that would otherwise end up in a landfill into baseload power and we’re able to control emissions through advanced environmental technologies. Waste-to-energy can even be paired with carbon capture technologies to produce energy with net-negative greenhouse gas emissions,” Bredahl said.

Modern waste-to-energy facilities are also highly compatible with municipal areas and can become important parts of and contributors to the communities they serve, providing needed power, economic growth, jobs and even recreational opportunities. Bredahl pointed to two examples featuring Babcock & Wilcox’s steam generation and environmental technologies. These include the Palm Beach Renewable Energy Center, which includes a nature conservation area and recreational

trails, and is located in the community of West Palm Beach, Florida, and the Copenhill/Amager Bakke waste-to-energy facility near Copenhagen, Denmark, which includes a public park, year-round ski slope and even a café on the power plant itself.

“Both facilities play important roles in the communities they serve, and their benefits have been embraced by residents. The Copenhill/Amager Bakke facility has even become a tourist attraction,” Bredahl said. “Embracing waste-to-energy is an important part of building a circular economy, creating sustainable renewable energy and supporting recycling programs. At the same time, it is a solution for eliminating landfill methane emissions and combatting climate change. We hope that governments and communities around the world will take a close look at waste-to-energy as a source of clean, renewable energy.”



877-777-0043 | Fax 419-931-0740

### Owner, Publisher and Editor

**ESTHER G. FOURNIER**  
news@AmericanRecycler.com

### Print and Digital Production

**MARY E. DARLOW**  
mary@AmericanRecycler.com

### Marketing Representatives

**MARY M. THORNTON**  
maryt@AmericanRecycler.com  
**MARY E. DARLOW**  
mary@AmericanRecycler.com

### Circulation Manager

**DONNA L. MCMANUS**  
donna@AmericanRecycler.com

### Writers and Contributors

**MAURA KELLER**  
mkeller@AmericanRecycler.com  
**RON STURGEON**  
rons@rdsinvestments.com  
**MARY M. THORNTON**  
maryt@AmericanRecycler.com

### Production Offices

1789 Indian Wood Circle, Ste 250  
Maumee, OH 43537  
877-777-0043 fax 419-931-0740  
www.AmericanRecycler.com

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# Leaders in recycling honored in New Jersey

An airport that recycles numerous items including polycarbonate runway signs; a municipality with a comprehensive curbside, drop-off and food waste recycling system; and a senior citizen who volunteered to collect and deliver loads of recyclables generated by his neighbors during the COVID-19 pandemic are among those honored as New Jersey's 2022 recycling leaders, Department of Environmental Protection Commissioner Shawn M. LaTourette announced.

Millville Executive Airport, Cumberland County; the Village of Ridgewood, Division of Recycling in Bergen County; and Donald Cammus of Florence Township in Burlington County are among the six businesses, organizations and individuals recognized during the DEP's 41st Annual Recycling Awards program held in conjunction with an annual recycling symposium hosted by the Association of New Jersey Recyclers. Other winners include Nestle Health Science of Bridgewater in Somerset County, Recycle My Battery of Middlesex County and Atlantic Health System, statewide.

In 1987, New Jersey became the first state to enact legislation that requires recycling in residential, commercial, and institutional settings. The DEP administers a number of grant and educational programs to help improve the statewide recycling rate. For 2019, New Jersey achieved an overall recycling rate of 56 percent. The national recycling rate is 32 percent.

## Recycling Awards

### Business - Nestle Health Science

Through numerous recycling, composting and waste reduction initiatives, Nestle Health Science in Bridgewater, Somerset County, was able to keep 86 percent of the waste it generated out of the waste disposal stream in 2021. The company recycles a wide range of traditional materials, as well as food waste, personal protective equipment, wooden pallets, plastic and metal drums, and coffee pods.

### Government - Village of Ridgewood, Division of Recycling

In addition to its comprehensive curbside collection program, the village of Ridgewood operates a recycling drop-off center that accepts food waste, textiles, electronics, concrete, printer cartridges and more. The village's Division of Recycling also does an outstanding job of educating residents about the recycling program through its website, flyers, green guide and more.

### Rising Star - Millville Executive Airport

The Millville Executive Airport in Cumberland County recycles polycarbonate runway signs, concrete, used oil and numerous materials from hangar cleanouts, as well as bottles, cans and paper from administrative and public spaces. The airport also made improvements to its internal recycling education program, including special training for maintenance staff.

### Outstanding Educator/Educational Program - Recycle My Battery

Recycle My Battery is a non-profit organization devoted to educating the public about the importance of battery recycling and increasing the number of batteries recycled. The Middlesex County-based organization uses press releases, flyers, magazine articles, YouTube videos, webinars, school talks, appearances at public events and other strategies to promote its mission. Recycle My Battery estimates that its various educational initiatives have reached more than 4.5 million people since the program's establishment in 2019.

### Source Reduction, Resource Management/Sustainability - Atlantic Health System

Atlantic Health System promotes sustainability in the health care sector through numerous initiatives, including an innovative program in which Powered Air Purifying Respirators were used instead of disposable respirators during the COVID-19 pandemic. Through use of these devices, Atlantic Health System saved 2,400 disposable respirators from being used and disposed each day. Over the course of a year, this system-wide initiative removed 876,000 disposable respirators from the waste stream.

### Volunteer Citizen - Donald Cammus

Donald Cammus volunteered his time to Florence Township when the pandemic and later, a truck driver shortage, impacted recycling collection in his community. Seeing that his neighbors needed help and that the local recycling collection program was adversely impacted by these factors, he loaded his neighbors' recyclables into his own vehicle and brought the materials to the township recycling center. This often resulted in Cammus making multiple trips every day to the recycling center, resulting in the recycling of numerous items.



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## PAPER

## Containerboard company will pay \$2.5M for violating clean air act in Louisiana

Packaging Corporation of America (PCA), headquartered in Illinois, has agreed to pay \$2.5 million in civil penalties to resolve allegations that it violated the Clean Air Act's General Duty Clause and Risk Management Program Regulations at its containerboard production mill in DeRidder, Louisiana.

The complaint, filed with the proposed settlement, the U.S. and the Louisiana Department of Environmental Quality (LDEQ), alleges nine Clean Air Act violations that stem, in part, from a fatal explosion and accidental release at the DeRidder mill on February 8, 2017. The explosion – which killed 3 workers and injured 7 others – launched a 100,000 gallon storage tank into the air and over a six-story building before it landed on mill equipment approximately 400' away. The blast also caused property damage and released extremely hazardous substances into the environment. The Environmental Protection Agency (EPA) inspected the DeRidder mill after the explosion, and uncovered additional Clean Air Act violations.

"This case demonstrates the tragic impacts to human life and the environment that can result from failures to follow appropriate chemical accident

prevention and preparation requirements," said Larry Starfield, acting assistant administrator for EPA's Office of Enforcement and Compliance Assurance. "This settlement both holds the Packaging Corporation of America accountable for failures that contributed to this accident and sends a clear message to corporations across the country on the importance of implementing appropriate chemical safety measures."

Section 112(r) of the Clean Air Act and its accompanying regulations are designed to prevent the accidental release of hazardous substances, like the explosion at the DeRidder mill. Congress added section 112(r) of the Clean Air Act in response to a 1984 catastrophic release of methyl isocyanate in Bhopal, India, that killed more than 3,400 people and caused over 200,000 others to suffer injuries. Under the Clean Air Act, facilities like PCA's are required to identify hazards, design and maintain a safe facility, minimize the consequences of accidental releases that do occur, and comply with regulatory prevention measures. Failing to comply with these requirements increases the risk of accidents and threatens surrounding communities.

## Survey shows generational split found with young consumers least confident about recycling

New data from sustainable packaging leader, DS Smith, has revealed that the generational gap in recycling has gone global – with older people more than any other generation holding themselves accountable for responsibly recycling of boxes.

While Gen Z members often are considered to be the most environmentally conscious, they have the least confidence among all age groups in knowing how to recycle, based on the packaging leader's new survey in the UK that matches a similar company poll in the U.S.

In the latest UK poll, two thirds of Gen Z respondents (those born from 1997 to 2012) blame barriers to recycling, including confusion over what items can be recycled, a shortage of recycling bins and lack of clear disposal instructions on products. Only 41 percent of those over age 55 see such obstacles.

Also, twice as many in the Gen Z group compared to their older counterparts say they don't know where to find advice on recycling.

The findings indicate that the generational split on sustainability is international.

A DS Smith survey in the U.S., released in May 2021, found that Baby Boomers – the generation that came of age amid the first Earth Day in 1970 – are the most motivated to recycle those leftover boxes.

Broken out by generation, Baby Boomers (71 percent) hold themselves more accountable for responsibly recycling their boxes than others – millennials (60 percent), Gen Z (59 percent) and Gen X (58 percent).

"To encourage all generations to play their part in helping the environment, we have to remove the barriers that keep them from doing so," said Keith Tornes, managing director of paper, forestry and recycling for DS Smith North America. "That's why at DS Smith, we have publicly supported local initiatives to improve recycling infrastructure and increased awareness to help consumers understand how and what to recycle."

The U.S. survey found that all groups were united when asked about the surplus of boxes from e-commerce spending and the message was clear: They're not bothered by the extra packages but do want them made of sustainable materials.

About 44 percent of those surveyed report getting more shopping deliveries during the COVID-19 pandemic, with 15 percent saying they are "drowning in boxes."

In an important, pro-environment signal, three-quarters (73 percent) of those polled say they care if the box is made from sustainable materials.

DS Smith, in its operations, supports a circular economy that aims to reduce and eliminate waste and advocates for the reuse of materials, including its box-to-box in 14 days model that ensures boxes are collected, recycled and turned into new boxes within two weeks.

*Online shoppers are reportedly overwhelmed with boxes.*

In 2020, in partnership with the Ellen MacArthur Foundation, the company launched its Circular Design Principles, centered around optimizing design for sustainability and waste reduction; and in 2021 it unveiled its Circular Design Metrics, an industry first that allows customers to rate the circularity of their packaging.

The company's purpose is to "Redefine Packaging for a Changing World," and as part of its "Now and Next Sustainability Strategy" and commitment to the circular economy, the company by 2030 will use packaging and recycling to replace problem plastics, reduce customer carbon and eliminate consumer packaging waste.

For instance, DS Smith recently announced that it has designed out more than 313 million pieces of problem plastics in the last two years alone as part of its ambitious plastic replacement program.

That amounts to more than three million units per week, as customers and consumers demonstrate demand for fiber-based packaging as an alternative to hard-to-recycle and single-use plastics.

To meet this demand, DS Smith designers have worked with customers to create thousands of new innovations to remove everyday plastic items.

The U.S. survey was conducted online among 1,020 Americans who have the same amount or more boxes lying around from online shopping compared to pre-pandemic. The margin of error is plus or minus three percentage points.



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*A man walked into a pet store and asked for a dozen bees. The clerk counted 13 bees out onto the counter.*

*"That's one too many," said the customer. The clerk replied, "It's a freebie!"*



# METALS

## Steel import permit applications decrease in September

Based on the Commerce Department's most recent Steel Import Monitoring and Analysis data, the American Iron and Steel Institute (AISI) reported that steel import permit applications for the month of September totaled 2,257,000 net tons (NT). This was a 9.2 percent decrease from the 2,485,000 permit tons recorded in August and a 10.1 percent decrease from the August final imports total of 2,510,000.

Import permit tonnage for finished steel in September was 1,864,000, down 10.5 percent from the final imports total of 2,083,000 in August. For the first nine months of 2022 (including September SIMA permits and August final imports), total and finished steel imports were 24,234,000 NT and 19,673,000 NT, up 4.5 percent and 22.5 percent, respectively, from the same period in 2021. The estimated finished steel import market share in September was 22 percent and is 24 percent year-to-date (YTD).

Steel imports with large increases in September permits vs. August final imports include steel piling (up 206 percent), line pipe (up 55 percent), standard pipe (up 37 percent), structural pipe and tubing (up 30 percent) and oil country goods (up 22 percent). Products with significant YTD increases vs. the same period in 2021 include wire rods (up 59 percent), oil country goods (up 52 percent), standard pipe (up 51 percent) and line pipe (up 44 percent).

In September, the largest steel import permit applications were for Canada (526,000 NT, down 11 percent from August final), South Korea (290,000 NT, up 64 percent), Mexico (289,000 NT, down 40 percent), Brazil (211,000 NT, up 20 percent) and Taiwan (90,000 NT, up 9 percent). Through the first nine months of 2022, the largest suppliers were Canada (5,236,000 NT, down 1 percent) and Mexico (4,188,000 NT, up 27 percent).

## Nucor to construct two flat-rolled galvanizing lines

Nucor Corporation's board of directors approved the construction of a galvanizing line at Nucor Steel Berkeley in South Carolina to support the company's strategy to expand its capabilities and grow participation in the automotive and consumer durables markets. The \$425 million investment will create more than 50 new full time jobs and start up is expected in mid-2025. Additionally, Nucor's board approved a galvanizing line to be constructed in the western U.S. with details to be announced at a future date.

"These investments support our strategy of shifting our mix to higher margin value-added products and capitalizing on sustainability trends that are driving opportunities for Nucor," said Leon Topalian, chair, president and chief executive officer of Nucor Corporation. "The new Berkeley line will

complement our recent galvanizing expansions at our Hickman and Gallatin operations and will be our eighth wholly-owned galvanizing line."

The new South Carolina galvanizing line will have an annual capacity of approximately 500,000 tons and will be able to produce galvanized steel up to 72 inches wide. Last month, Nucor Steel Berkeley announced a 5 year \$200 million modernization project, including constructing a new air separation unit to supply industrial gases for the mill's steelmaking operations.

The State of South Carolina has offered job development credits to Nucor and assisted with site preparation costs by providing a grant. The state's utility provider, Santee Cooper, similarly has provided a grant to Berkeley County to help cover the costs of facility upgrades related to the expansion.

## ISRI Scrap Specifications Circular updated to include new and revised nonferrous

The Institute of Scrap Recycling Industries (ISRI) announced the latest update to the ISRI Scrap Specifications Circular which includes revisions of existing and the addition of new non-ferrous scrap specifications.

### New Specifications

•TANK ALUMINUM CHOPS and STRAWS

Shall consist of clean aluminum, chops or straws, free of screening, hair-wire, iron, copper, insulation and other non-metallic items. Must be free of minus 20 mesh material. Must contain 99 percent aluminum content.

•TEASE ALUMINUM WIRE and CABLE

Shall consist of new, clean, aluminum wire or cable free from hair wire, ACSR, wire screen, iron, insulation and other non-metallic items. Must contain 99 percent aluminum content.

### Revised Specifications

•REELS Mixed Nonferrous Wheel Weights

To consist of nonferrous wheel weights that are a minimum of 35 percent (overall) nonferrous and no more than 65 percent Iron (Fe). Anticipated nonferrous material may be both lead and zinc weights. To be free of foreign

material. Final material specifications to be determined between buyer and seller.

•TALL E.C. ALUMINUM CHOPS and STRAWS


Shall consist of clean, 1350 and/or 1050 alloy, E.C. aluminum, chops or straws, free of screening, hair-wire, iron, copper, insulation and other non-metallic items. Must be free of minus 20 mesh material. Must contain 99.45 percent aluminum content.


•TALON E.C. ALUMINUM WIRE and CABLE

Shall consist of new, clean, 1350 and/or 1050, E.C. aluminum wire or cable free from hair wire, ACSR, wire screen, tape, iron, insulation and other non-metallic items. Must contain 99.45 percent aluminum content.

ISRI's Scrap Specifications Circular provides industry guidelines for buying and selling a variety of processed scrap commodities, including ferrous, nonferrous, paper, plastics, electronics, rubber and glass. More information about the rules governing the procedures from the addition, amendment, or withdrawal of ISRI's scrap specifications, can be found in the Scrap Specifications Circular.


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# METALS

## August 2022 crude steel production decreases

World crude steel production for the 64 countries reporting to the World Steel Association (worldsteel) was 150.6 million tonnes (Mt) in August 2022, a 3.0 percent decrease compared to August 2021.

Africa produced 1.3 Mt in August 2022, up 3.5 percent on August 2021. Asia and Oceania produced 112.6 Mt, down 0.2 percent. The EU (27) produced 9.7 Mt, down 13.3 percent. Europe, Other produced 3.6 Mt, down 18.6 percent. The Middle East produced 3.2 Mt, up 34.2 percent. North America produced 9.6 Mt, down 5.4 percent. Russia & other CIS + Ukraine produced 6.9 Mt, down 22.4 percent.

South America produced 3.6 Mt, down 10.1 percent.

### Top 10 steel-producing countries

China produced 83.9 Mt in August 2022, up 0.5 percent on August 2021. India produced 10.2 Mt, up 1.2 percent. Japan produced 7.3 Mt, down 7.4 percent. The United States produced 7.0 Mt, down 7.1 percent. Russia is estimated to have produced 5.9 Mt, down 5.5 percent. South Korea is estimated to have produced 6.1 Mt, down 0.4 percent. Germany produced 2.9 Mt, down 2.3 percent. Turkey produced 2.8 Mt, down 21.0 percent. Brazil produced 2.8 Mt, down 11.3 percent. Iran produced 2.1 Mt, up 64.7 percent.

### Top 10 Steel-Producing Countries

	AUG 2022	% Change AUG 22/21	JAN-AUG 2022 (Mt)	% Change AUG 22/21
CHINA	83.9	0.5	693.2	-5.7
INDIA	10.2	1.2	83.5	7.1
JAPAN	7.3	-7.4	60.7	-5.2
U.S.	7.0	-7.1	54.9	-3.7
RUSSIA	5.9	-5.5	48.9	-5.8
SOUTH KOREA	6.1	-0.4	46.0	-3.0
GERMANY	2.9	-2.3	25.4	-4.8
TURKEY	2.8	-21.0	24.4	-8.8
BRAZIL	2.8	-11.3	23.1	-4.5
IRAN	2.1	64.7	19.5	7.8

## Novelis breaks ground on \$2.5 billion aluminum plant

Novelis Inc. began construction on its \$2.5 billion recycling and rolling plant in Bay Minette, Alabama. The highly advanced facility will create up to 1,000 new jobs and will have an initial 600 kilotonnes of finished aluminum goods capacity per year focused on the beverage container market, with flexibility for automotive production. It also adds a new recycling center for beverage cans, increasing the company's recycling capacity by 15 billion cans per year when fully operational.

"Through this investment, we want to demonstrate the strength of our

growing customer partnerships, the commitment we have to sustainably grow our business, and the innovative, forward-thinking approach we are taking to modern manufacturing," said Steve Fisher, president and chief executive officer of Novelis.

Novelis has hired its core leadership team to lead the multi-year effort to build the facility. The company is also recruiting for roles in engineering, maintenance, finance, human resources and IT. Interested candidates can visit Novelis's website to search for available positions or submit their resume

for consideration as additional roles are available.

Site work is also underway including earthwork, excavation and piling. Over the next three months, Novelis will construct two new roadways on the site and expand the utility infrastructure necessary to begin building construction. Commissioning of the facility is scheduled for mid-2025. The company selected a leading engineering company as its site layout, engineering and construction contractor, an Alabama-based firm to serve as earthworks contractor, and several manufac-

turing equipment providers that have longstanding relationships with Novelis across the world.

The company plans to invest \$150,000 in south Alabama non-profit organizations over the next six months. To encourage recycling throughout the community, Novelis has launched a partnership with Baldwin County to provide recycling bins and education at all county-owned buildings. The company plans to invest in additional opportunities to encourage and incentivize Alabamans to recycle more often.



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### Scrap Metals MarketWatch



Commodity		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
<b>FERROUS</b>						
#1 Bushelings	per gross ton	\$365.00	\$363.00	\$371.00	\$375.00	\$385.00
#1 Bundles	per gross ton	360.00	358.00	352.00	359.00	372.00
Structural	per gross ton	290.00	292.00	307.00	340.00	365.00
#1 & #2 Mixed Steel	per gross ton	284.00	281.00	296.00	310.00	330.00
Crushed Auto Bodies	per gross ton	192.00	194.00	196.00	209.00	295.00
Shredded Auto Scrap	per gross ton	375.00	371.00	374.00	369.00	360.00
<b>NON FERROUS</b>						
#1 Copper Bright	per pound	3.31	3.21	3.22	3.23	3.21
#2 Copper Wire & Tubing	per pound	3.06	2.96	2.96	3.02	2.97
Aluminum Cans	per pound	.73	.74	.72	.72	.74
Al/Cu Radiators	per pound	1.79	1.75	1.76	1.74	1.75
Aluminum Radiators	per pound	.60	.65	.62	.63	.69
Heater Cores	per pound	1.49	1.54	1.51	1.60	1.59
Stainless Steel	per pound	.54	.55	.56	.57	.61

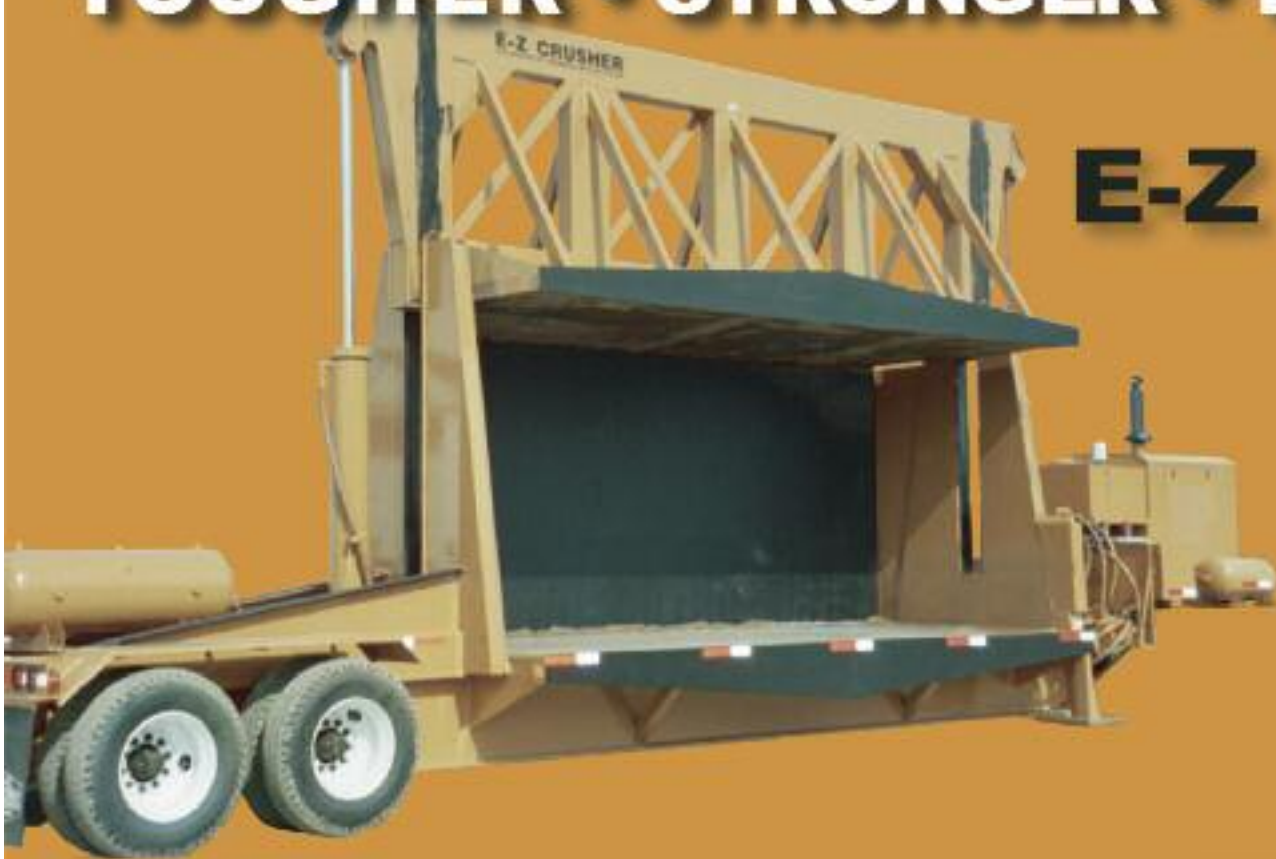
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These crushers are solidly built and dependable with a unique hydraulic system that gives you maximum power when you need it the most.

The hydraulic cylinders are uniquely mounted on the bottom deck of the unit. This means the hydraulic cylinders "pull" rather than "push" the crusher deck down. This puts less stress on the machine. At the point of greatest resistance, the cylinder is at its strongest position.

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## WASTE

# Mushrooms used to decarbonize construction waste

Lendlease, Rubicon Technologies, Inc., Mycocyte and Rockwood Sustainable Solutions, announced the completion of a successfully partnered pilot involving used asphalt shingles, mushrooms and mycoremediation technology to reduce construction and demolition waste in order to produce a sustainable and reusable product to further create a more circular economy.

According to the Environmental Protection Agency, 11 to 13 million tons of asphalt shingles end up in landfills each year, where they take upwards of 300 years to break down. After seeing the large percentage of waste that was generated by used asphalt roofing shingles from a recent re-roofing project at their Fort Campbell Army installation in

Kentucky, Lendlease, Rubicon, Mycocyte, and Rockwood Sustainable Solutions proposed a solution to reuse the material in a new capacity.

“Every asphalt shingle from those 214 homes would have gone to a landfill,” said Sara Neff, Head of Sustainability at Lendlease Americas. “There was simply no viable use for them. We understand the importance of reducing our Scope 3 carbon by diverting waste streams from the landfill. After teaming up with Rubicon, Mycocyte, and Rockwood Sustainable Solutions, we came up with an innovative idea using mycoremediation technology; com-



binning mushrooms and shingles to break down waste materials and create a new by-product that could ideally be reintroduced for reuse, furthering a circular economy.”

Shingle samples were gathered and transported to Rockwood Sustainable Solutions’ facility in Lebanon, Tennessee where Mycocyte, an environmental remediation company that uses fungi to

decarbonize waste streams, performed what is believed to be a first-of-its-kind pilot study, mixing the sample with three strains of fungi, a process called mycoremediation.

“The successful completion of this pilot is a fantastic example of environmental innovation in action,” said Nate Morris, chairman and chief executive officer of Rubicon. “Rubicon’s mission is to end waste, and it is innovations such as these that find second life circular solutions for hard-to-recycle materials. Partnerships, like this one between Rubicon, Lendlease, Mycocyte, and Rockwood Sustain-

able Solutions are possible when environmental innovation and the circular economy meet.”

“This partnership has the potential to be a template for the future,” continued Neff. “Of those 11 to 13 million tons of asphalt shingles dumped in landfills each year, only 5 to 10 percent are being recycled. Taking a product that is no longer viable and combining it with a natural renewable source that results in a new product is a phenomenal outcome that is both beneficial to the environment and bolsters the economy. We are proud of this pilot and our future partnerships with Rubicon, Rockwood Sustainable Solutions and Mycocyte.”

## ‘Save More Than Food’ Campaign encourages families to reduce food waste by donating or reimagining leftovers

As inflation increases food prices, SWACO is renewing efforts to help families save money and reduce their reliance on the landfill by helping them avoid throwing leftovers and other food in the trash.

“We may not be able to control rising gas and food prices,” said Joe Lombardi, Solid Waste Authority of Central Ohio (SWACO) executive director. “But each of us can commit to making the most of our resources and ease the

burden felt by our family and the environment when food waste is sent to the landfill.”

Reducing food waste remains an important issue for Central Ohioans. In a public opinion poll conducted earlier this year, 83 percent of residents were concerned with the amount of food wasted every day in Central Ohio. A 2019 Waste Characterization Study published by SWACO documented that nearly a million pounds of food arrives at the County Landfill every day, and a large portion of that food comes from households.

Kyle O’Keefe, SWACO’s director of Innovation and Programs, said the average family is spending nearly \$2,000 a year on food they purchase but never eat. “Leftovers and spoiled produce make up the majority of what individuals throw out,” continued O’Keefe. “Families can easily save money and keep unnecessary food waste out of a landfill by making small improvements in the way they manage food.”

SWACO’s Save More Than Food (SMTF) website offers ideas on making those simple and intentional steps part of anyone’s daily routine:

- Fridge Night prompts families to collect leftovers and look for creative ideas to bring them together. It also lets families properly freeze and date any leftovers a family can’t use.

- Label foods and leftovers that need to be eaten soon or place them within eyesight.

- Make leftovers new again by visiting [SaveMoreThanFood.org](http://SaveMoreThanFood.org) to find a leftover recipe to demonstrate or try.

- Shopping more frequently and with a list reduces cost and waste. Creating meal plans makes those trips much easier.

- Proper food storage allows herbs, milk, cheese, fruits, and vegetables to have a much longer life in refrigerators.

SMTF pilot programs are already paying dividends, reducing household food waste by over 20 percent in areas where food waste drop-off sites and educational programs that encourage food waste prevention are available.

The Central Ohio Food Waste Initiative published the Central Ohio Food Waste Action Plan in May 2019; it has 20 specific initiatives for preventing food waste, rescuing and redistributing edible food, and recycling food through composting and other technologies.

Overall, the campaign hopes to reduce food waste by half by 2030.

Residents and businesses alike can visit [savemorethanfood.org](http://savemorethanfood.org) for information to help reduce food waste at home and work. The site also features an online food waste quiz and shareable resources for co-workers, students and communities.

■ For more WASTE news, see Page B1

*My father and I were in the car traveling to a family outing. On the way, after passing a graveyard, my dad asked, “Did you know that’s a popular cemetery?”*

*“No, why?” I responded.*

*“People are just dying to get in*

*there!” he replied.*

*After I groaned, He continued, in all seriousness, “But really, did you know I can’t be buried there?”*

*“Why not, Dad?” I asked, surprised and perplexed.*

*“Because I’m not dead yet!”*

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# AUTOMOTIVE

## Novelis opens \$35 million Customer Solution Center

Novelis Inc., an aluminum solutions provider and leader in aluminum rolling and recycling, celebrated the opening of its Customer Solution Center (CSC) for automotive in Novi, Michigan, a suburb of Metro Detroit. The \$35 million facility is part of Novelis' global network of CSCs, which are designed to speed the development of aluminum solutions through collaboration between the company and its customers, as well as others in the value chain. Through the centers, Novelis partners with automakers and Tier 1 suppliers to maximize lightweight, high-strength aluminum in the next generation of vehicle design. In addition to the facility in Novi, Novelis operates automotive CSCs in Stuttgart, Germany, and Shanghai, China.

"Novelis' network of Customer Solution Centers is a centerpiece of our purpose, which is shaping a sustainable world together," said Philippe Meyer, senior vice president and chief technology officer, Novelis Inc. "As a leading automotive aluminum supplier, this investment will strengthen the partnerships we have with our customers and ensure that innovative, low-carbon aluminum adoption continues to grow across the world."

The company's 100 employees in Novi represent expertise in research and technology, technical development and commercial support. The center's high-tech equipment ranges from a hot stamping press to computer-aided design (CAD) software to visualization

technologies that model vehicle safety scenarios. These capabilities enable Novelis to develop new aluminum solutions and demonstrate their benefits for current and future vehicle applications. Customers and Tier 1 suppliers are using the center to see these benefits firsthand, which include lighter designs, greener lifecycles, and simpler, more cost-effective solutions.

Since launching the Customer Solution Centers in 2018, Novelis has made several advancements in automotive innovation. Examples include an aluminum intensive battery enclosure solution for electric vehicles; all-new high strength and heat-treatable alloys that are designed to compete with ultra-high strength, hot-formed steel solutions; and research proving out the benefits of aluminum use in doors and closures, one of the fastest growing aluminum applications in new vehicles. In addition, the company has worked to increase the amount of recycled aluminum in automotive alloys and expanded closed-loop recycling systems, which take back aluminum scrap from customers generated during the stamping process and recycle it back into the same product.

Aluminum is the fastest growing automotive material according to DuckerFrontier. For more than 40 years, Novelis has been a leading global supplier of aluminum sheet to the industry, with an automotive manufacturing footprint in Asia, North America and Europe.

## National Auto Body Council honors Bill Garoutte

The National Auto Body Council® (NABC) announced that its president and chief executive officer, Bill Garoutte, will step down at the end of 2022, after serving in that role for five years. He previously served on the board of the National Auto Body Council from 2006 to 2011.

Garoutte, who joined NABC in 2017, oversaw the transition to a forward thinking organization to serve the modern collision repair industry. Today, the NABC is recognized as the premier organization serving the collision repair industry.

Garoutte is stepping down to care for an aging parent, an all-consuming challenge many have faced. He will continue his commitment to serving the collision repair industry, as well his roles on various national and community boards.

Garoutte, a seasoned collision repair industry veteran, spent more than 20 years in senior leadership roles with national collision repair organizations and service providers. Over the last two decades, he has served on industry boards including NABC, SCRS and CIECA.



Novelis Customer Solution Center ribbon cutting celebration in Novi, Michigan. Pictured L-R from Novelis: Brad Peterson, Nick Stark, Jim Carney, Philippe Meyer, Jarrod Cunnings, Paul Becker, Don Whitacre and Tom Boney. PHOTO COURTESY OF RICK OSENTOSKI/AP IMAGES FOR NOVELIS

## SALVAGING Millions

by Ron Sturgeon  
Autosalvageconsultant.com

### Sharpen your organizational skills to compete and be efficient

To compete in today's environment, you're going to have to learn to do more with less. One of the most important skills you can learn is how to organize better. It's a complex subject with 100 different opinions about how to do it best, but I will try to hit the hotspots. I encourage you to read a book on the topic.

You'll be amazed once you get really organized how much more work you can do or how much more free time you have and still do the same amount of work you're now doing. Let's start with email.

•It's important that you try to work e-mail timely of course, but it is equally important that your inbox is almost always empty, or darn close. Make sure you've created folders for topics you need to categorize. It's not unusual to find people with thousands of emails in their inbox. Just take all of them and move them to a new folder marked old e-mails. Starting with the very next e-mails you receive; you should make sure you handle them. Do whatever is required, move them to a folder, or delete them because they're not important or because you're finished with them. Try to keep your inbox below 10 e-mails at any given time.

•Let's address folders next. You should save all your documents in folders. In those folders, names should resemble the list of folders you have for e-mails. When you need to save a document, you save it in the

documents. You don't leave it in an e-mail.

•Finally, it's important that you make lots of lists. I keep them on post it notes. Yes, it can be a bit messy, but successful people make lots of notes. Don't feel bad because you've got lots of notes. However, make certain you have a system for how you manage the notes, how you prioritize them, and when you complete them. You can also keep a mini or full-size journal, number the pages, stick the post-it notes in it and move them forward if not handled. It's great to have a journal to take to meeting. Never go without one.

•Part of being better organized is learning to delegate. You can do it yourself quicker than someone else can do it. That's probably right, so I can't fault that idea. But the reality is if it takes them twice as long to do it as you would take, you still have freed time to go do something more important by delegating.

It's important that you delegate things that you can't do, shouldn't do, or won't do. Obviously, at different points in our lives, the list of what you will delegate will change. I'm old, so I want to delegate everything, even though this really isn't feasible. Regardless of what makes your list of items to delegate, make sure you get organized so that you can do more with less and make more money.

**Remember, only you can make BUSINESS GREAT!**

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



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# BUSINESS BRIEFS

## Quest appoints Johnston as senior VP and CFO

■ Quest Resource Holding Corporation, a national leader in environmental waste and recycling services, announced that it has appointed Brett Johnston as senior vice president and chief financial officer, effective November 1, 2022.

Prior to Quest, Johnston spent nearly 20 years at Arcosa, Inc., most recently serving as senior vice president of Arcosa's Construction Products Group and leading a team of over 50 members in accounting, finance and IT. During his tenure, he led the successful implementation of new accounting and finance systems and processes within Arcosa's fastest growing segment. Johnston holds an MBA from the University of Texas and a Bachelor of Science in Economics from Texas A&M University.

## Sean Daoud joins ISRI board as director-at-large

■ The Institute of Scrap Recycling Industries (ISRI), has elected Sean Daoud, a second-generation recycler from the association's Pacific-Northwest Chapter, to its open director-at-large position.

Daoud serves as the vice president, treasurer and shareholder of PNW Metal Recycling, Inc., which has five locations in Oregon and three in Washington.

Daoud has been active in ISRI, holding several leadership positions. He is a former Pacific-Northwest Chapter president, as well as one of three founding co-chairs of ISRI's Young Executives Council in 2018.

## Nucor names Topalian as chair of the board

■ Nucor Corporation announced that its president and chief executive officer, Leon J. Topalian, has assumed the additional role of chair of the board of directors and that board member, Christopher J. Kearney, has been appointed lead director of the board, both effective immediately. John H. Walker, a member of the board since 2008 and most recently its non-executive chairman, will continue to serve as a board member.

Topalian has been president and chief executive officer of Nucor and a member of its board of directors since 2020. Prior to that time, he held various leadership positions at Nucor, including president and chief operating officer in 2019, executive vice president from 2017 to 2019, and vice president from 2013 to 2017. Having joined Nucor in 1996, Topalian also has served as general manager at two of Nucor's facilities, in Arkansas and Illinois, as well as melting and casting manager, an operations manager, a cold mill production supervisor and a project manager.

Kearney, who was unanimously chosen by the independent directors of Nucor's board of directors to serve as lead director, has been an integral member of the board since he joined in 2008. Kearney founded Eagle Marsh Holdings, LLC in 2016 and has served as its managing partner since inception. He also serves as a director of Otis Worldwide Corporation and served as a director of UTC from 2018 to 2020, prior to the spin-off of Otis from UTC.

## Waste Harmonics hires two new team members

■ Waste Harmonics, a national technology-enabled managed waste service provider, welcomed two new employees to its team: Anthony Diienzo as vice president of recycled materials, and Melissa Modica as director of business development, sustainability. Diienzo and Modica will help the company continue to grow its sustainability, recycling and business development initiatives.

In his new role, Diienzo will bring his knowledge and 10+ years of experience in the waste and recycling industry to offer current and future Waste Harmonics customers a true comprehensive waste and recycling program that best fits their needs to improve green initiatives and reduce their annual waste spend. Diienzo was previously employed at RWS Recycling & Waste Solutions from 2013 to 2022.

Modica will bring her 13+ years of experience and long-standing partnerships to her new position to help support Waste Harmonics customers reach their sustainability goals through the company's technology and innovative solutions. Previously, Modica was employed at Insignia Waste Holdings from 2020 to 2022, DRM Waste Management from 2018 to 2020 and RiverRoad Waste Solutions from 2009 to 2018.

*A mother traveled across the country to watch her only son get married and graduate from the air force on the exact same day. "Thank you for coming," the son told her. "It means so much."*

*"Of course I'd be here," the mother replied. "It's not every day a mom watches her son get his wings and have them clipped all in one day."*

## Aurora Solar makes management changes

■ The Board of directors of Aurora Solar Technologies Inc. announced that Gordon Deans has retired as president and chief executive officer of the company, following 13 years as a founder and senior executive. Deans continues to support the commercialization of the company's insight platform along with the combined business product and market strategy in a consultative role. Concurrently, the company's board has appointed Kevin Dodds to succeed Deans as chief executive officer.

Dr. Roger Buckeridge has also been appointed to the board of directors. These leadership changes are the culmination of a process that involved the acquisition of BT Imaging and the needs of the combined business.

Dodds is a recognized leader with a proven track record in growing \$100 million plus industrial technology companies.

## Bridgestone invests \$60 million for expansion

■ Bridgestone Americas announced an investment of \$60 million to expand its Bridgestone Bandag, LLC manufacturing plant in Abilene, Texas.

The 50,000 sq.ft. expansion of the Abilene plant is aimed at the growing demand for the company's tread rubber products, driven by the rapid growth of its retread business. The expansion includes an immediate increase in operational activity, as well as the construction of new mixing operations. The mixing operations are expected to be completed and in operation by January 2025. The investment and the additional days of operations increase the plant's output by 16 percent.

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# BRIEFS

## Robert Bunting appointed Bunting president and CEO

■ Robert Bunting followed in the footsteps of his grandfather and father with his appointment as Bunting's president and chief executive officer. On October 1, 2022, Robert succeeded his father, Bob Bunting, in overseeing the continued growth of the global Bunting group. Bob Bunting assumes the position of chairman.

Bunting is one of the world's leading designers and manufacturers of magnetic separators, metal detectors, materials handling, magnetic printing cylinders, magnets, magnet assemblies, and magnetizing equipment. The company, headquartered in Newton, Kansas, has multiple locations including Bunting-Elk Grove Village; Bunting-DuBois; Bunting-Berkhamsted and Bunting-Redditch in the United Kingdom; and Ningbo, China.

Robert Bunting joined Bunting's Elk Grove Village magnet sales team in 2007. Before joining Bunting, he had earned a degree in business management at Rockhurst University in Kansas City, Missouri, and gained valuable experience during two years as an Internal Sales Coordinator at Sun Life Financial.

In 2009, Robert moved into external sales covering the Illinois and Wisconsin areas and focusing on material handling, metal detection and magnetic separation. Under his management, sales in the territory grew by 25 percent. This success led to Robert's appointment as the global product manager for metal detection in 2014, where his responsibilities ranged from product development through to sales growth.

After the successful development of the metal detector product range, Robert was appointed general manager of Bunting Elk Grove Village in 2016, including the online retail website Buy-Magnets.com. As general manager, he oversaw magnet inventory management, the identification and introduction of new magnetic products such as the N-40 and N-52 grades of neodymium, and the development of digital marketing strategies for online sales, including the introduction of a new website.

## ISRI chief scientist appointed to committee

■ ISRI, the Voice of the Recycling Industry™, announced the selection of ISRI chief scientist/director of environmental management David Wagger, Ph.D., as a representative member in the General Services Administration (GSA) Acquisition Policy Federal Advisory Committee (GAP FAC).

Waggar was appointed by GSA administrator Robin Carnahan to serve a two-year term. The GAP FAC is governed by the provisions of the Federal Advisory Committee Act.

In his role, Wagger will provide the committee with perspectives and insights of the recycling industry.

GAP FAC's initial focus will be on driving regulatory, policy, and process changes required to embed climate.



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# Handling waste from metal recycling

by MAURA KELLER

[mkeller@americanrecycler.com](mailto:mkeller@americanrecycler.com)

Within the metal recycling process, there is a vast amount of “waste” produced that simply can’t be ignored.

“Metal is a reusable and valuable resource. It’s important to recycle metal not only for the environmental and economic impact, but also to prevent metal being present in ground water supply,” said Mikel Shecht, executive vice president, Geomet Recycling. “We take the mandatory steps and have processes in place to ensure that the waste our facilities produce is properly disposed to lower the impact on community landfills and the environment at large. Like many other industries, the technology used in waste facilities is evolving quickly.”

Geomet Recycling, for example, receives different types of packaging materials in the form of cardboard boxes, pallets and steel strapping and banding. The company has arrangements and partners set up to recycle the paper products from packaging, a pallet service/rebuilder/recycler, and they thoroughly inspect and make sure all metal packaging is recycled.

Shecht said there are some byproduct waste materials, for example, the plastic that comes from the casing of aluminum and copper wires that they recycle. Geomet Recycling has been looking for ways to give a second life to such items by partnering with companies that can use it as raw material or in products they manufacture.

Another area of metal waste that requires recycling is rare earth magnets. Geomega Resources recycles rare earth magnets, a new type of metal waste that is growing in volume and importance.

According to Kiril Mugerma, chief executive officer, Geomega Resources, until recently, magnet waste was being discarded together with regular metal and steel scrap that was destined to be shredded and then melted in large furnaces.

“Metal and steel scrap is low value but large volume. The waste it generates is of even lower value and there is significant metal value loss,” Mugerma said. “In the case of Geomega’s process, we are able to capture the rare earths that are otherwise completely lost in the traditional metal recycling industry.”

As Mugerma further explained, it is critical to recover rare earth magnets separately from the traditional metal scrap heading for melting. The ability to capture rare earth metals provides several advantages:

- Additional revenue for the metal recycling industry, allowing them to increase their collection sources.



Workers mine rare earth metals from a mine in Nancheng County, Jiangxi province in China.

PHOTO BY STRINGER

- A circular economy for these critical and strategic metals.

- Local production of rare earth elements from material, originally mined and produced in China.

“We saw China make the necessary adjustments in the beginning of the previous decade,” Mugerma said. “Today, it is believed that 30 percent of the rare earths that go to magnet production are coming from magnet recycling. We have seen an incremental growth in R&D of more environmentally friendly approaches to recycle rare earths from magnets and Geomega has been actively involved in it since 2017.”

### Technological Progress

The recycling and waste industries have made substantial advancements over the last 20 years. As Shecht explained, mechanically, those advancements continue to improve. A key focus of the metal recycling industry is to isolate and separate many commodities (often mixed together, from metal, to plastics, paper, and aggregate) to allow each of these commodities to find their way back into the usable stream rather than into landfills.

“Lightning quick magnetics, vibration, screening, color sorting, chemical analysis, pneumatics and density separation equipment exists and continues to improve. We are excited to see what is coming next,” Shecht said.

Indeed, to make the technology competitive with the process in China, Geomega had to develop a process where not only are rare earths recovered but also iron, in a salable form, and all major reagents.

“By making the process practically zero waste, the technology becomes competitive and environmentally sustainable, which is a must in today’s ESG environment,” Mugerma said.

### Metal Waste Within Lithium Ion Battery Recycling

One area of metal waste recycling that is gaining attention is the recycling of lithium ion batteries and their metal waste components. David Regan, vice president of commercial at Aqua Metals, said Aqua Metals’ proprietary AquaRefining process relies predominantly on renewable electricity rather than high heat or chemicals to recycle, which results in a significantly cleaner process. The few chemicals we do use within the firm’s closed loop process are

See METAL WASTE, Page B7



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# County solves growing landfill leachate problem

Florida's Indian River County (IRC) Solid Waste Disposal District (SWDD) facility has secured a long-term, on-site solution for managing its growing volumes of landfill leachate.

The county's strategic service partner, Heartland Water Technology, will furnish, install and operate a state-of-the-art leachate treatment facility using Heartland's award winning Heartland Concentrator™. The plant has commenced construction and will begin service early next year.

The SWDD generates approximately 25,000 gallons per day of landfill leachate. As the landfill grows, this volume is expected to increase. Like many landfills, the SWDD currently sends leachate to the county's Utility Wastewater Treatment Facility and has started trucking concentrated leachate to an off-site disposal plant across the State at considerable expense. In addition to adding more vehicles to the road, off-site disposal is fraught with uncertainty, as disposal outlets are cutting off leachate at an accelerating rate. Once cut off from a primary disposal solution, costs can rise severalfold.

Uneasy with off-site disposal of landfill leachate, the IRC board of county commissioners, through its leadership at the SWDD, sought a long term solution that would eliminate off-site disposal of leachate, lock in a long term

cost-certain solution, and improve its community and environmental stewardship.

After a rigorous selection process, including a third party expert evaluation of several alternate disposal treatments, the SWDD selected an on-site evaporation solution from Heartland Water Technology. SWDD's decision was based on Heartland's complete leachate management service offering, its proven track record with on-site leachate treatment, and a highly successful on-site pilot project, validated by the SWDD's engineering consulting expert, Geosyntec. "The county's leadership team showed great vision with this project," said Earl Jones, chief executive officer of Heartland Water Technology. "Bettering the community and environment, treating the leachate on-site and locking in solution costs for the county for years to come is good government."

On-site treatment also delivers operational and economic benefits for the county. "Leachate management is a major challenge for every landfill," said Himanshu Mehta, managing director for the Indian River County board of county commissioners. "Our leachate management solution takes away this challenge for the county allowing focus on what we do best, which is the safe, professional management of disposal operations."

# EPA adds Brillo Landfill site to the national priorities list

In a move that will protect the nearby community, the U.S. Environmental Protection Agency (EPA) is adding the Brillo Landfill in Victory, New York to its Superfund National Priorities List (NPL), along with four other sites across the country. EPA will also propose two sites to the NPL, where releases of contamination pose significant human health and environmental risk.

"Adding the Brillo Landfill to the Superfund National Priorities List will provide the federal funding and capabilities needed to address this legacy pollution in Cayuga County," said Regional Administrator Lisa F. Garcia. "We will work with our state, local and community partners to investigate the extent of contamination, weigh our cleanup options and pursue those responsible to pay for the mess they've left behind."

Now closed, the Brillo Landfill received various industrial and sanitary waste, as well as paint sludge and wastewater treatment sludge. As a result, it is currently contaminated with volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and metals such as lead and mercury, found in numerous waste disposal units and in the surrounding soil. Further New York State Department of Environmental Conservation (NYSDEC) investigations in 2021 found similar contamination and per- and polyfluoroalkyl substances (PFAS) in nearby wetlands bordering Little Sodus Creek.

EPA conducted an immediate removal action to protect public health starting in June 2018 through 2019, removing approximately 2,000 intact drums and drum carcasses, including about 8,000 gallons of liquid waste and 782 tons of contaminated soil and other solid debris. However, a long-term cleanup is still required to address the remaining contamination at the site. Groundwater sampling results from facility monitoring wells show site-related contaminants above federal and state groundwater standards. NYSDEC has tested private drinking water wells within one mile of the site and has not identified impacts to these wells.

Thousands of contaminated sites, from landfills, processing plants, to manufacturing facilities exist nationally due to hazardous waste being dumped, left out in the open, or otherwise improperly managed. President Biden's Bipartisan Infrastructure Law will accelerate EPA's work to help communities clean up these contaminated sites with a \$3.5 billion investment in the Superfund Remedial Program and reinstates the Superfund chemical excise taxes, making it one of the largest investments in American history to address legacy pollution. This historic investment strengthens EPA's ability to tackle threats to human health and the environment, and EPA has already set action in motion to clear the backlog of the 49 contaminated sites which had been awaiting funding to start remedial action.

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*Mr. Jones: "Thank goodness! I thought I was going deaf."*

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# SWACO 2021 reports record diversion rate

The Solid Waste Authority of Central Ohio (SWACO) has published the 2021 annual Community Impact Report providing insights into local disposal trends at the landfill, and updates on collaborations with schools, non-profits, local governments and other organizations to improve recycling and increase food waste diversion opportunities. Most notably, SWACO reported a 51 percent diversion rate – one of the highest rates in the Midwest and more evidence that Central Ohioans value reducing their reliance on the landfill by now recycling more material than is landfilled.

“While we still have a way to go in order to reach our goal to divert 75 percent of all waste stream materials from the landfill by 2032, the reported numbers show we continue to make progress,” said Joe Lombardi, executive director for SWACO. “Our region’s progress is a direct result of the tireless efforts of numerous public and private partners working together to create a safer, healthier and greener community.”

## Highlights from the report:

The Central Ohio Food Waste Initiative, a collaborative group focused on food waste prevention and led by SWACO, created the Save More Than Food (SMTF) campaign in 2020 to help cut Central Ohio’s food waste in half by 2030. As part of this program of work, SWACO received a \$60,000 federal grant from the U.S. Environmental Protection Agency (EPA) to study food waste behaviors and the positive benefits public education campaigns like SMTF can have. Last year, funding from the grant supported partnerships between SWACO, the City of Upper Arlington and The Ohio State University to study the behaviors of hundreds of households before and after receiving food waste reduction, prevention and composting materials. Not only did the residents of Upper Arlington capture and divert 138,000 pounds of food waste from the landfill, the study also documented:

- 21 percent of households reduced the amount of food waste they created.

- 40 percent increase in the use of the city’s food waste drop off program.

SWACO has also now partnered with 10 local communities to expand the food waste drop off program and today, 29 percent of Franklin County residents report composting food or

yard waste either at home, at the curb or through a drop off program.

In addition to food waste diversion efforts, SWACO has continued to help improve the infrastructure of curbside recycling programs in municipalities across the county. For example, in 2021 SWACO worked with the City of Whitehall to transition homeowners to a volume-based trash and recycling collection program which incentivized households to reduce their trash bill by recycling more. The results are impressive:

- 95 percent participation in the curbside recycling program compared to 26 percent in 2020.

- 85 percent increase in the amount of material recycled.

- 21 percent decrease in trash.

In Gahanna, SWACO partnered with the city to implement Feet on the Street, a national program from The Recycling Partnership, which uses a team of community-based observers to visit each resident’s recycling cart to provide tailored feedback on how to ensure only the accepted recyclables are placed into the cart. As a result, the city saw a 45 percent reduction in the amount of items incorrectly placed in Gahanna’s curbside recycling program.

While most Central Ohio homeowners have access to a curbside recycling program, many times those households require additional recycling capacity. SWACO offers a Drop Off Recycling Program to assist those residents. In 2021, SWACO expanded the program, adding new drop-off locations at the Whitehall Community Park YMCA, Jerry L. Garver YMCA and Eldon & Elise Ward YMCA. The program collected one million pounds of recyclables every month. SWACO also piloted new options for recycling at multi-family housing complexes, intended to provide greater access to recycling for families living in apartments and condos.

## New resources provide incentives for businesses to recycle

In 2021, SWACO hired staff dedicated to helping Central Ohio businesses – one of the largest generators of landfill materials – improve and expand their recycling programs. This included the piloting of a new incentive program which helped to jump-start recycling at two local businesses:

- The King Arts Complex used SWACO’s Business Tool Kit to audit its waste stream to better understand

the type of waste being generated. Then, with SWACO’s support, purchased recycling containers and installed educational signage detailing what the program accepts. As a result, they now recycle two cubic yards of material each week.

- Zipline Logistics worked with SWACO to switch from plastic and other nonrecyclable breakroom items to reusable glassware and mugs. SWACO and Zipline are also working to implement a recycling program to capture plastic bottles and metal cans. In the first month of the pilot, Zipline collected one cubic yard of materials, diverting the equivalent of 200 gallons of milk from the landfill.

## Grant programs and dedicated resources help partners reach sustainability goals

SWACO continues to offer a variety of grants to help area schools, universities, local governments and non-profit organizations reach their sustainability goals. Last year, SWACO awarded more than \$264,000 in grants to help partners reach their waste diversion goals. One of the grant programs supported more than a dozen partners and helped divert more than 440,000 pounds of recyclables and compost from the landfill.

SWACO also offers several other programs for local organizations, like schools, to meet their sustainability goals. In 2021, SWACO partnered with five local schools to provide technical guidance on setting up new or improving existing recycling programs.

SWACO provided participating schools with new recycling containers and proper recycling signage to ensure the program’s success and engage students in the recycling activities as part of a school’s Green Team.

## Safe and responsible waste disposal

Even amid these programs, SWACO continued to prioritize the safe operation of the Franklin County Sanitary Landfill, a publicly owned entity serving 41 communities in Central Ohio. In 2021, SWACO handled 49,000 more tons of waste material than in the previous year, a particularly impressive feat considering labor shortages faced by industries across the board. SWACO also generated nearly \$8.5 million in revenue from the sale of renewable landfill gas, helping reduce emissions and heat 13,000 area homes.

Finally, next year, SWACO will be joined by BQ Energy, AEP and the City of Columbus to break ground on Columbus Solar Park, a 50-megawatt solar array that will generate enough renewable energy to power more than 5,000 homes when it opens in late 2023.

“Our annual Community Impact Report provides an important moment to reflect on our progress, but we cannot lose sight of our vision for the future,” said Lombardi. “SWACO is proud to continue serving as a catalyst for change for both individuals and business leaders who must come together to collectively push our sustainability goals forward.”

## Waste Pro welcomes new division manager in Orlando, Florida

Waste Pro named Regina Caronia as division manager of Waste Pro’s Orlando, Florida division. Caronia has over 30 years experience in the waste industry, most recently as district manager for Waste Management.

Caronia began her career in 1991 with Western Waste. She worked her way through the industry with national haulers such as Veolia. Thanks to her

prior experience, she connected with Central Florida Regional vice president Erik Sankey, who led her to Waste Pro.

In her new role, Caronia will lead the Orlando division, which services more than 70,000 customers in the cities of Maitland and Winter Park, the town of Windermere and unincorporated Orange County.

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# EQUIPMENT SPOTLIGHT

## Primary Reduction

by **MARY M. THORNTON**

maryt@americanrecycler.com

Due to a variety of resulting benefits, America and much of the world continues their efforts in waste reduction. Some benefits, such as reduced landfill costs, are more quickly realized than others – such as reduced toxicity in our environment. For many years, manufacturers have offered equipment that is useful in decreasing waste levels.

HogZilla Grinders are used in the biomass industry and for waste reduction, recycling, storm recovery, land clearing, C&D debris, tire refuse or any tough grinding application. The company has built grinders for over 40 years, and staff members strive to advance the firm's "best grinder" status through added efficiency, torque, proven production, reliability, visible quality, durability, solid value and an emphasis on customer service.

"Regarding our product for industrial wood grinding, we started from the ground up with a specific goal to take on the toughest applications. We knew this would drive us to manufacture the most reliable,

highest capacity tub and horizontal grinder on the market, and we did it with the creation of HogZilla," Tim Wenger, vice president and HogZilla sales manager, explained. CW now offers over twenty HogZilla grinder models, ranging from mid-sized to massive, self propelled track driven and self loading units, which can be powered by either diesel or electric power.

Wenger added, "As the cost of diesel fuel has risen, electric powered grinders have increasingly become the grinder of choice. If your operation involves a centralized location, you certainly owe it to yourself to research an electric powered HogZilla. Of course, a stationary machine isn't possible in some situations. We offer portable wheeled machines, along with track mounted HogZilla grinders, with numerous options for customizing to your needs. A portable wheeled machine moves easily around a job-site. Our HogZilla on tracks is unparalleled in production and mobility and offers many advantages over a stationary product – such as grinding in wet weather or soft



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terrain. Tracks eliminate the need for an extra truck to move the grinder from pile to pile at a job-site, which saves time and increases production. A HogZilla track machine also allows for one man operation and helps with cleanup around and under the grinder, further reducing maintenance."

CW is always looking for new ways to improve work processes for their customers so they can provide the exact machine needed for an operation. "We know our clients require a reliable machine with increased efficiency, reduced maintenance, heavy duty construction, and simplicity. Our customer service and parts support exemplifies that, and our customers can attest to it," Wenger concluded.

The latest and most cutting edge high torque shredder unit, Doppstadt's Inventhor 9, is a primary reduction shredder used to break down challenging materials, such as tires, C&D waste, green waste, wood waste, mattresses, industrial waste and more. One of the largest shredders in the world, the Inventhor 9 features a 525 hp, tier 5 MTU engine," said Nick Cobos, sales manager at Ecoverse, the North American representative for Doppstadt.

With a patented Vari-oDirect drive system, the Inventhor 9 can automatically increase shaft torque

when needed, reverse the shaft, or start under load. The single shaft design with breakaway comb "makes the shredding chamber incredibly forgiving of material that would damage other equipment.

"Operation is simple and easy, with a dynamic CANbus control system and a full multichannel remote control. Engineered with the technician in mind, the machine's large doors allow for open access to the entire engine compartment, making for easy maintenance.

"The fold-out comb door provides total access to the shredding chamber, allowing for simple checks and changes of wear parts and shredding chamber. For example, shaft teeth can be changed with just one bolt. No other unit in the marketplace can match the versatility, forgiveness and low owner operator costs.

"For over two decades, Doppstadt machines have been the shredder of choice for many of North America's largest waste processing companies," Cobos noted.

Doppstadt's Inventhor can easily handle contaminated feedstocks, protecting downstream equipment, and separate metals with a rare-earth Neodymium magnet. Setup requires only minutes, and the unit is capable of throughputs exceeding 100 tons per hour, depending on operator and material conditions. With U.S. and

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See PRIMARY REDUCTION, Page B5

Continued on Page B5

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## Miami-Dade County's first electric waste truck in use

The Miami-Dade County Department of Solid Waste Management (DSWM), Florida, introduced its first electric powered waste collection vehicle.

The vehicle will collect waste in an area surrounding the facility. The vehicle will be parked at the facility to charge overnight and the electricity used to recharge the vehicle is produced on-site via waste incineration.

Essentially, the vehicle will be powered by the waste it collects.

The electric waste collection vehicle features dual electric motors that produce 448 continuous h.p. and 4,051 lb.-ft. of peak torque from zero RPM. Four nickel manganese cobalt oxide lithium-ion batteries provide power, which is recovered while driving via the vehicle's two-stage regenerative braking system.

The total vehicle cost is \$688,619, including \$39,465 for the charging system and a 60 month/250,000 service agreement for \$33,000. Routine maintenance will occur yearly rather than quarterly, as is customary with vehicles powered by fossil fuels.

At current fuel pricing levels, DSWM should see a return on investment by year five (year six if fuel prices decrease).

## Primary reduction Continued from Page B4

Canadian locations, the Ecoverse family of brands includes Backhus Windrow Turners, Backers Star Screens, Tiger Depackaging Systems, EcoSift Density Separators, EcoScreen Double Trommels, EcoStack Conveyors and CK International Balers.



Schutte Hammermill

Bengal Machine, through subsidiaries, CM Shredders and Schutte Hammermill, designs and manufactures both slow and high speed primary waste reduction equipment. Those machines are intended for applications such as e-waste and data destruction. Bengal offers slow speed, high torque shredders, high speed rotary crushers and dual, high speed hammermills, suitable for primary reduction of both bulky and flowable e-waste, from pilot scale through production rates exceeding 50 tons per hour. Bengal equipment provides primary reduction solutions for products ranging from large lithium ion batteries to singular SSD reduction to sub 2mm nominal sized particles.

Schutte has been in business since 1928 and offers size reduction solutions such as the RC Crusher, which offers heavy, cast carbide, or cast manganese hammers. The RC also includes a large feed opening and adjustable speed, from 700 RPM and up – for 24" to 60" widths at

high production rates. Schutte's WA Series is the company's most versatile machine, ranging from 6" lab scale up to 60" production scale. Built for heavy duty use, mills feature removable wear plates made from abrasive resistant steel, various options for hammer styles and finishes—along with heavy duty grates that can be up to 2" thick, for heavy product that is abrasive. The RA Series mills involve two stacking WA mills that work in tandem. This combination creates an efficient, fine grinding mill

without disrupting material transfer from stage to stage. A compact design allows users to install the machine into portable systems, or use in smaller spaces via vertical installation. These mills operate at various speeds up to 3,600 RPM to produce controlled, uniform particle size distribution.

"We supply these products to all types of clients who work with material such as e-waste, recycled asphalt, shingles, data destruction, battery materials and recycled batteries, auto catalyst, tungsten ore, glass cullet production, auto shredder residue, medical waste and more," commented Bill Castine, general manager. He added, "Lack of homogeneity in primary waste

## MANUFACTURERS Cont.

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**Dave Fleming**

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www.ssiworld.com

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**Charles Hildebrand**

603-601-2304

www.untha-america.com

**Vecoplan LLC**

**Wendy Mancino**

877-738-3241

www.vecoplanllc.com

**Weima**

**Madison Burt**

803-802-7170

www.weimaamerica.com

streams, including e-waste, requires the most effective equipment to be designed and manufactured to be both durable and productive at true production speed. Among both small and large scale battery recycling and production clients, we see a strong forecast for our product offering. More emphasis is placed on circular economy principles as manufacturers add waste recovery as part of their process. The energy push toward developing new and sustainable battery materials is also significant. The lifespan of these products is relatively short so it only makes sense to recover and refine core and/or limited materials when manufacturing new products."

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## NEW PRODUCT SHOWCASE

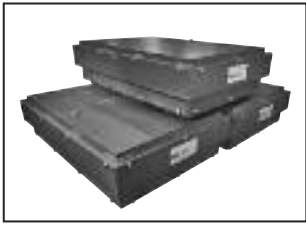


### ASV LAUNCHES NEW YANMAR-POWERED RT-40 LOADER

ASV Holdings Inc. introduces a repowered RT-40 Posi-Track® loader with a Yanmar engine. Not only does the 38.2 h.p. engine add more power, it improves serviceability for machine owners by allowing them to have the Yanmar engine serviced at ASV dealers.

The RT-40 is a more productive, safer option than walk-behind and stand-on loaders. Additionally, the small-frame RT-40 showcases new comfort, visibility and performance features over its predecessor. It is a leading performer in applications that require work in tight spaces, including urban snow clearing and landscaping, making it an ideal rental product.

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



### SHREDDER ISOLATION MOUNTS REDUCE VIBRATION AND SHOCK

Best Process Solutions (BPS) is offering a complete line of shredder isolation mounts for the auto shredding and recycling industries.

BPS shredder isolation mounts are designed to reduce vibration and shock from impact loading, which are the major causes of wear and fatigue. These heavy-duty units are located between the main shredder assembly and the concrete support foundation.

The units feature high-impact side guards and heavy-duty mechanical down stops. They do not require hydraulic dampening fluid and are virtually maintenance free due to the elastomeric isolation element.

**Best Process Solutions**  
1071 Industrial Parkway  
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### DOOSAN DD100 DOZERS ARE IN FULL PRODUCTION FOR U.S.

The new Doosan® DD100 dozers are being produced at the manufacturing facility in South Korea. Customers can expect to see an increasing number of Doosan dozers in North America as more machines hit dealerships.

Doosan Infracore North America unveiled its first dozer: the 10 metric ton DD100. The pre-prototype machine garnered significant interest and Doosan moved ahead with finalizing its first pilot machines.

In June of this year, Doosan shipped its first DD100 dozer from South Korea to North America. Shortly upon its arrival, the customer quickly put the machine to work at its topsoil production facility.

**Doosan Infracore, LLC.**  
2905 Shawnee Industrial Way  
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### GREENCHUTE IS PLASTIC-FREE, RECYCLABLE FOR LEAF COLLECTION

DS Smith's GreenChute is a 100 percent curbside recyclable and reusable corrugated yard waste bag filler.

GreenChute resists moisture to help easily collect yard debris, including leaves, branches, grass and other waste. The cardboard lawn funnel holds the user's lawn bag open and in place to easily rake leaves and lawn clippings into a pile and place them through GreenChute into the bag for disposal. The cardboard structure includes a printed QR code that, when scanned, shares the assembly and usage instructions to the consumer.

**DS Smith Plc**  
350 Euston Road  
London, NW1 3AX  
+44 (0)20 7756 1800  
www.dssmith.com



### MECALAC INTRODUCES NEW SWING LOADER MODELS

Mecalac introduces three new swing loader models to the North American market. The all new AS750, AS850 and AS1000 models join the previously released swing loaders, rounding out a comprehensive series that has revolutionized loading around the world.

Mecalac's swing loaders feature a rigid chassis and three steering modes – 2-wheel, 4-wheel and 4-wheel crab – that allow for tighter turns than a standard articulated loader. Combine that with the innovative Mecalac swivel boom and you have a machine that can perform a complete rotation in a footprint that is 20 percent smaller than a conventional loader.

**Mecalac North America**  
282 Dedham Street  
Norfolk, MA 02056  
508-921-3076  
www.mecalac.com

## S.O.R.T. program helps Michigan county reduce landfill waste

A pilot program by the Kent County Department of Public Works (DPW) and the City of Rockford, Michigan helps residents divert resources from landfills by placing their waste materials into the right bin.

The DPW's Separate Out Trash Recycling (S.O.R.T.) program helps guide where waste should go using colored bins that separate recycling and trash. After a successful temporary pilot program in 2021 using the branded bins at the Rockford Outdoor Refreshment Area, the city is installing permanent S.O.R.T. bins in all municipal buildings and parks.

"The S.O.R.T. program has been a major success in Rockford, and we take great pride in helping divert waste from landfills whenever and however we can," said Thad Beard, city manager for the City of Rockford. "The consistent and uniform access to the S.O.R.T. bins help our residents think twice about where their waste goes and provides education on recycling and waste in our community. We look forward to the continued use of this program."

By utilizing the S.O.R.T. bins,

users are helping reduce landfilled waste and bring Kent County closer to its goal of reducing landfill waste by 90 percent by 2030. The DPW is hoping to expand the use of S.O.R.T. bins to other communities using the blueprint of the Rockford pilot program.

Anyone in the area interested in using S.O.R.T. bins in their office, business, school, place of worship or upcoming social event can visit the DPW's website to submit a request for materials to set up the bins. The DPW offers a sign maker tool and vinyl wraps to place on waste bins that let people know what waste should go in each bin. The DPW will provide input on options available for organics, recycling, and trash collection.

The Kent County Department of Public Works provides municipal solid waste disposal services to ensure the effective removal, storage, and disposal of residential and commercial solid waste through various facilities and programs, including Waste-to-Energy, Recycling and Education Center, North Kent Transfer Station and South Kent Landfill.

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# Metal waste

■Continued from Page B1

recycled, producing a reduction of 97 percent in the chemical waste stream.

In comparison with other lithium-ion battery (LiB) recycling processes, the AquaRefining process is by far the cleanest approach. For example: pyro-based recycling produces 4212 kilograms of CO2 for every metric ton of black mass processed. Black mass is a type of e-waste comprising of crushed and shredded battery cells and contains mixtures of valuable metals including lithium, manganese, cobalt and nickel.

“In comparison, one metric ton of black mass processed through standard chemical hydro has a 2,960 kg of CO2 footprint. This is significantly better than pyro. Nonetheless, the process generates nearly three metric tons of CO2 for every metric ton of product,” Regan said.

“In contrast, Aqua Metals’ internal estimates indicate that AquaRefining produces 65 kg CO2 emissions for every metric ton of black mass produced. That converts to 0.065 MT per 1 ton of black mass – a roughly 98 percent reduction in CO2 over both pyro and hydro.”

So why is the amount of emissions produced from the black mass recycling process important to the metal waste recycling segment of the industry? Quite simply, as Regan explained, “the sheer pending volume of spent LiBs expected to enter the market in the next decade (TechCrunch forecasts 15 million metric tons (MT) of spent LIB batteries by 2030) means that is vital right now to build a cost-effective, scalable recycling infrastructure that is environmentally sustainable from inception.”

Many mainstream recycling companies rely on either pyro, also called smelting, or traditional hydro processes, both of which have unsustainable environmental footprints when applied to significant volumes of recycling.

“The former results in unsafe workplaces, emitting more than two tons of greenhouse gasses per ton of batteries smelted as well as other pollutants, while losing high value minerals like lithium and manganese in the process,” Regan said. “The latter produces a toxic chemical waste stream, considered by the EPA as harmful to human health, aquatic life, and the environment. Chemical waste streams need to be treated and landfilled properly, which incurs significant cost.”

Unlike standard hydroprocessing, AquaRefining is an emissions-free, room temperature process. All chemicals are recycled, eliminating chemical waste and the purchase of expensive replacement chemicals. AquaRefining essentially builds metal by electroplating one atom at a time.

“Our process starts from the black mass which is a result of the breaking and separation and crushing of the lithium cells to begin with,” Regan said. “We take that black mass as the input to our process, and we begin to work with that black mass through the use of chemicals that are in that closed loop. The electricity is the catalyst that allows us to separate out and then selectively plate key minerals in metal form. While AquaRefining is still in development, Aqua Metals is making steady progress toward taking it beyond the idea stage and into the best solution for recycling lithium-ion batteries.”

### Looking Ahead

Recycling and waste companies should pay close attention to the always changing supply stream as product composition, uses, and forms are always evolving, thus affecting the amount of waste produced in the metal recycling process.

As Shecht pointed out, recycling and waste companies are on the front line of identifying these new streams and the opportunities to improve processes and reduce landfill waste.

“The producing industries and the recycling and waste industries can work closely together to engineer with the intent to recycle,” Shecht said. “Robotics, software, AI, camera improvements and energy efficient solutions are exciting opportunities for our industries and communities. Hiring and company culture will have massive impacts on the success of these advances. Passion drives innovation and improvements.”

Mugerman added that today’s recycling companies are living in an evolving recycling world. We saw a few of these transformations over the last 120 years as usage of various metals increased and recycling companies had to adapt.

“Today, we see that more and more critical metals are being used that present new value opportunities,” Mugerman said. “Therefore, as concentrations of these critical and strategic metals increase, what was considered waste from the metal recycling industry is becoming a new recycling stream that the most creative recycling companies would be able to capture and benefit from.”

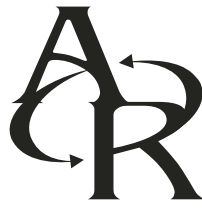
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