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The mounting e-waste challenge



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Waste-to-energy incentives encourage plant expansion



by MAURA KELLER

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In a recent study by Straits Research, the global waste-to-energy (WTE) market was \$37.1 billion in 2022 and is expected to reach an estimated value of \$68.78 billion by 2031. This level of growth is indicative of how the waste and recycling industry has embraced WTE plants in an effort to lessen the burden on today's landfills and properly handle the disposal of waste. But WTE initiatives also face a myriad of challenges that could potentially impact this predicted growth.

Matthew Pierson, project developer at Babcock & Wilcox (B&W), said that while existing WTE plants continue strong operations and a solid backlog of parts and service work remains, the new-build WTE market in the U.S. has cooled over the past several years.

"For example, the most recent commercial WTE project in the U.S. commenced in 2015—Babcock & Wilcox provided the boilers and flue gas treatment (FGT) train for the Palm Beach Renewable Energy Facility (PB REF) expansion project in Florida," Pierson said. "Over the past 18 to 24 months we have seen an uptick in early-stage development activity for WTE projects, which is an encouraging signal. We believe WTE will continue to be employed as part of the waste management solution in the U.S. as we transition to a cleaner, greener energy production future and look forward to seeing several of these development opportunities converted to successful projects."

Pierson explained that two of the biggest influences opposing the WTE industry are the amount of low-cost land-fill space in the U.S. and the misperception that WTE plants are unclean.

"When developing a new-build WTE plant, especially when debt financed, building a proforma with an acceptable return on investment can be a challenge," Pierson said. "One of the major income streams for a WTE plant is the tipping fee, and when the market drives the tipping fee down by offering very low-cost land-fill disposal, project economics can be less favorable. This is where developers must remain strategic in selecting locations and pursue additional revenue streams for their projects."

Although a significant portion of waste streams that will generally enter a WTE plant tipping floor are biogenic, Pierson said so far none of the recent federal level programs have covered WTE with any renewable energy credits.

"That said, B&W has been developing several technologies for the past decades that can complement either an existing WTE plant or be integrated with a new-build plant to bolster project economics by providing additional revenue streams," Pierson said. One technology in particular is B&W's post combustion CO2 capture technology, SolveBright B&W's SolveBright technology captures the CO2 emitted from the combustion process, yielding an extremely clean flue gas from the plant and a CO2 stream for pipeline transport and beneficial use or sequestration.

"With CO2 capture, WTE projects can take advantage of incentives through investment tax credits, production tax credits, and other revenue streams while at the same time alleviating public perception of flue gas laden with greenhouse gas (GHG) emissions," Pierson said.

Waste-To-Energy In the Organics Waste Space

In the area of organics waste, Bioenergy Devco chief executive officer

Shawn Kreloff further explained, the term "waste-to-energy" is often narrowly associated with the incineration industry. In contrast, converting organics to renewable energy covers a broader spectrum of industries, each having distinct environmental implications.

"Over recent years, organics recycling has experienced significant expansion. However, when it comes to the waste-to-energy realm, particularly incineration, we haven't seen the construction of any major facilities in recent years," Kreloff said.

Waste-to-energy is a form of energy recovery through anaerobic digestion. Kreloff stressed that the growth and expansion of commercial scale anaerobic digestion facilities is the path forward for making meaningful impact on mitigating emissions from food waste and landfills.

"Anaerobic digestion is a natural biological process that breaks down organic materials in the absence of oxygen. During anaerobic digestion, microorganisms thrive and feed on organic matter like food waste. As these microorganisms consume the organic material, they produce biogas, which is primarily composed of methane and carbon dioxide," Kreloff said. "This biogas is captured and utilized as a renewable energy source."

Meanwhile, as Kreloff explained, the remaining solid residue, digestate, undergoes further treatment to produce a nutrient-rich organic soil amendment. Anaerobic digestion not only effectively treats organic waste, greatly reducing greenhouse gas emissions compared to land-fill disposal, but also provides a valuable source of renewable energy, making it a key player in sustainable waste management and decarbonization efforts.

See WASTE-TO-ENERGY, Page A3

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NJ DEP puts an end to statewide illegal dumping scheme

New Jersey Attorney General Matthew J. Platkin and Department of Environmental Protection (DEP) Commissioner Shawn M. LaTourette announced several recent advancements protective of public health and the environment and new case filings targeting polluters across the State whose toxic legacies continue to threaten New Jersey's overburdened communities. Begun under the Murphy Administration in 2018, this initiative seeks to remedy past inequities in environmental law enforcement affecting communities of color, low-income communities, low-English-proficiency communities, and those subject to cumulative environmental stressors. This selected list of recent results includes:

- The State obtained a court order requiring 24 defendants, who were engaged in an egregious statewide illegal waste dumping scheme centered in Newark, to immediately stop working in the solid waste industry, remove the solid waste they deposited, and pay \$8 million in penalties;
- Fillit and Jersey Recycling Corporation in Palmyra will create a conservation easement of 31.34 acres along Pennsauken Creek, remediate the unauthorized solid waste, properly close the landfill, and pay civil penalties amounting to \$4,012,000;
- British Petroleum agreed to fully remediate the harmful soil and groundwater contamination emanating from underground gas storage tanks at Monk's Amoco in Camden, compensate DEP at least \$260,000, and pay up to \$100,000 to the City of Camden.

In addition, the Attorney General and DEP filed six enforcement actions seeking to hold additional polluters accountable in overburdened New Jersey communities.

M.J. & Sons, Newark and Statewide – On September 7, 2023, the Superior Court ordered 24 defendants in an illegal statewide dumping scheme to remove solid waste and return dumping sites to their original conditions, exit the solid waste business until they have the proper permits and licenses, and to pay over \$8 million in penalties. The Attorney General and DEP sued 25 individual and corporate defendants in April for illegally transporting and dumping solid waste and fill material. The defendants dumped solid waste on private properties without the owners' permission, who thought they were receiving "clean" or "free" soil or fill based on advertisements on Facebook Marketplace. The defendants illegally dumped waste on properties with no warning, including on preserved farmland in Montgomery Township. The illegally dumped materials included demolition and construction debris, plastics, metals, and vehicle parts, causing risks to human and environmental health. Homeowners are urged to be wary of "clean" or "free" soil or fill advertisements. Soil or fill material sold or offered free of charge may contain debris or contaminants.

"The action by the court sends a clear message that illegally operating a solid waste business and dumping waste on the property of unsuspecting homeowners will not be tolerated," said Attorney General Platkin. "Our environmental enforcement

and environmental justice laws provide for steep penalties in order to deter this kind of behavior and to strip profits from illegal activities. Moreover, justice and equity demand immediate action to address ongoing environmental harms affecting multiple New Jersey communities."

"These defendants advertised 'free clean fill' to lure unsuspecting homeowners to receive harmful contaminated solid waste on their residential properties. The court's decision sends the message that DEP will not tolerate illegal dumping and will vigorously pursue those who engage in this harmful activity in violation of our environmental laws," said Commissioner LaTourette.

The largest penalty, almost \$4.7 million, was levied against Walter Miranda-Vicuna, Mirian L. Miranda, Bryan Miranda, and the companies they owned and managed, including MJSons Excavating, LLC; MJ & Sons Excavation, LLC; MJ & Sons Contractors Trucking, LLC; B. Brothers Management, LLC; and Excavating BJ Corp. The other defendants in the case are Edwin G. Miranda-Vicuna of Newark; Bruce Licausi, Jr. of Bangor, Maine; Andre "Dre" Salinas of Elizabeth; Ana Pancheco-Vega of Easton, Pennsylvania; Joe Wallace of Sussex; Henry Chimbo of Newark; and Angel Bravo-Gomez of Lafayette.

The base of this illegal dumping scheme was on East Bigelow Street in Newark, which was used to stockpile waste, including from construction sites, without a solid waste facility permit until it could be dumped elsewhere in the State. Another overburdened community significantly affected by the illegal dumping scheme is Montgomery, as the area surrounding the protected farmland has a significant minority population. Other sites are located in Woolwich, Lafayette, Delaware Township, Alexandria, Southampton, Hamilton, Pohatcong, Bedminster, Liberty Township, Pittstown, and Readington.

Fillit, Palmyra – This settlement will protect 31 acres of waterfront land, including wetlands, on the Pennsauken Creek and Palmyra Cove along the banks of the Delaware River. Past owners had illegally accepted and stockpiled mulch, painted and treated wood, piles of concrete, and contaminated soil. The Judicial Consent Order with Fillit and Sansone Urban Renewal Entity II, LLC on August 15, 2022 resulted in a conservation easement of 31.34 acres along Pennsauken Creek, removal of solid waste, closure of a historic municipal landfill on the site, and implementation of green infrastructure best management practices for managing stormwater. Fillit paid a civil penalty of \$450,000, plus \$12,000 in an outstanding penalty from 2011. Separately, the Department secured a \$3,550,000 judgment against former operators at the site, Jersey Recycling Services, LLC, and its owner, Bradley Sirken, who were the subject of a 2017 SCI Investigation into organized crime's ties to the solid waste industry in New Jersey.

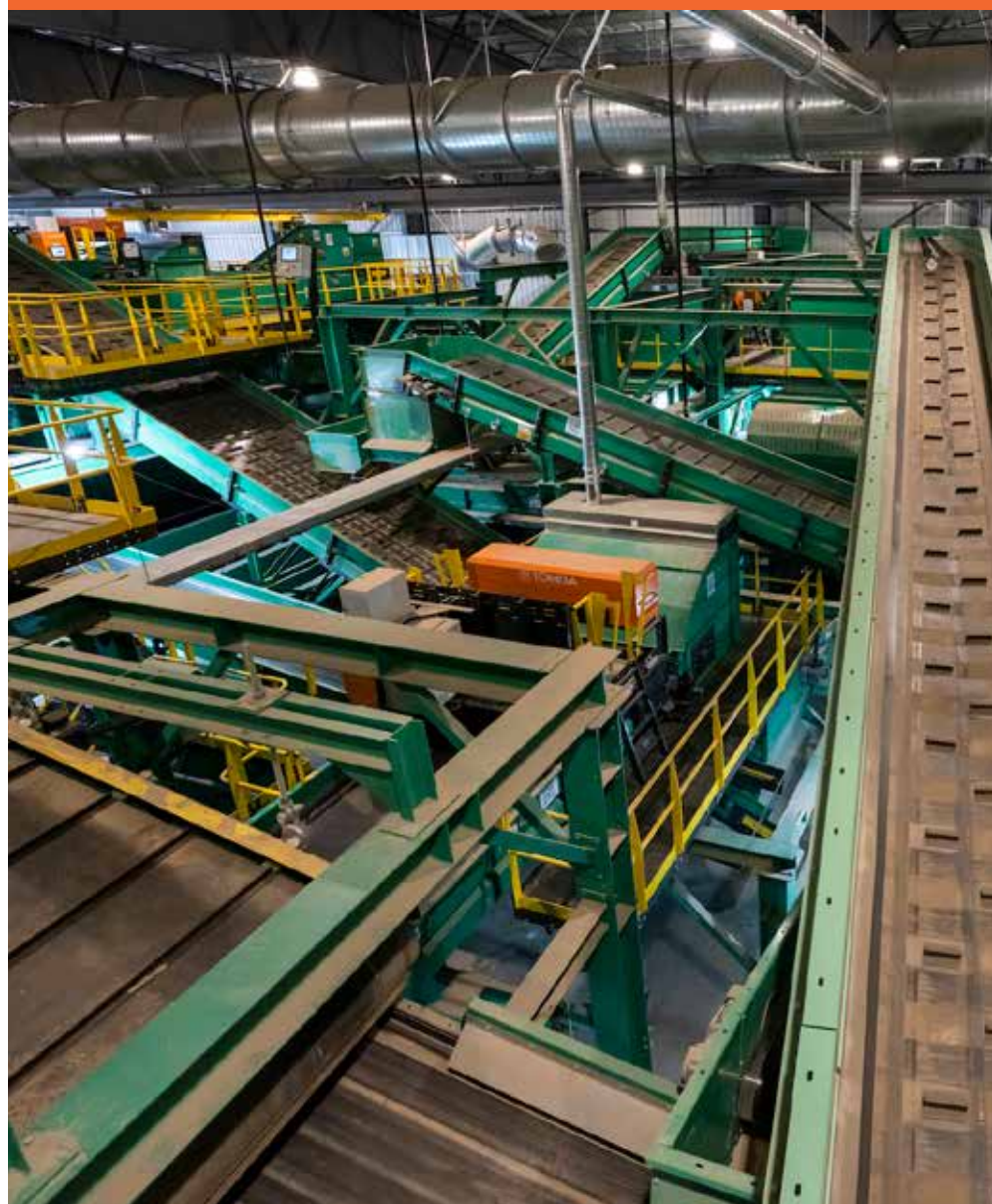
The enforcement actions and case outcomes are being handled by the Environmental Enforcement and Environmental Justice (EEJ) Section within the Division of Law's Affirmative Civil Enforcement Practice Group.

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Waste-to-energy

■Continued from Page A1

“Anaerobic digestion harnesses the methane produced during the decomposition of organic waste to generate renewable energy. This closed loop process not only reduces methane emissions, but also provides a sustainable source of electricity and heat, contributing to the decarbonization of our energy systems,” Kreloff said. “When deployed at commercial scale, anaerobic digestion can produce and provide clean, renewable energy for homes, vehicles and more.”

The increased attention and concern over climate change is the single biggest factor affecting the waste management and energy industries. Kreloff said that recent focus has shifted towards recycling and mitigating greenhouse gasses through organics recycling.

“Research suggests that inadequate organic waste management leads to the substantial release of emissions such as carbon dioxide and methane into our atmosphere. Organic waste constitutes a substantial portion of municipal waste streams,” Kreloff said. “When discarded in landfills or incinerators, organic waste releases potent greenhouse gasses that contribute to climate change. In addition to its environmental impact, the disposal of organic waste in landfills is an inefficient use of resources. Organics recycling offers a sustainable alternative.”

Waste-To-Energy in the Renewable Natural Gas Segment

According to Chris Psihoules, senior associate who focuses on energy,

infrastructure and resources at Norton Rose Fulbright US LLP, considering most of his waste-to-energy projects are in the renewable natural gas (RNG) space, over the last five years, RNG projects in North America have just about doubled.

“With respect to RNG projects, there are two impediments. The first is public perception, specifically with respect to non-government organizations (NGOs),” Psihoules said. “RNG projects are carbon neutral – they capture emissions from waste that would otherwise escape to the atmosphere, process it, and in many cases, send it through gas pipelines for use downstream. The anaerobic digestion technology used during this process is not new, but has recently grown in popularity.”

Psihoules added that public perception of “gas” projects (specifically with respect to many NGOs) remains negative, and he fears that is in large part due to the RNG process being misunderstood.

The second impediment that WTE is facing within the RNG segment is RNG quality specifications.

“In conjunction with the uptick in RNG projects, interstate natural gas pipelines have seen a significant rise in RNG pipelines. Because of this, interstate pipelines have been filing RNG tariffs at Federal Energy Regulatory Commission (FERC) that set forth different gas quality specifications from those required of the conventional natural gas producers,” Psihoules said. “These tariffs have the ability to stifle RNG production if not well thought out. Many of our RNG clients have intervened in these proceedings to make certain that the RNG projects are able to meet the RNG quality specifications being set out by the interstate pipelines.”

Future Projections

The first steps toward a sustainable waste management program should always be reduce, reuse and recycle. As Pierson explained, even when this philosophy is fully embraced across the country, there will always remain significant waste streams that need to be handled. To generate a strong, clean and efficient circular economy that includes WTE, there will be a significant education about how the WTE technology has progressed over the past decades to being some of the cleanest energy producing plants in the world.

“Landfills have environmental concerns, limited lifecycles and, unfortunately, are generally accepted as the norm, but permitting and development of new landfills can be an expensive endeavor,” Pierson said. “WTE plants offer 90 percent reduction in waste volume, and coupled with landfill for ash and non-recyclable, non-combustible material, can extend existing landfill life and be an integrated solution with an eye to the future.”

Psihoules pointed to a recent Wood Mackenzie report that suggests that by 2050, RNG may make up nearly three percent of the North American natural gas market. The current RNG level is 0.5 percent.

“With respect to the recycling industry, one of my clients is using plastics conversion technology. This option is a form of pyrolysis, to produce fuels, petrochemicals and feedstocks that can become the building blocks of new plastics, and wax that can go into candles, polishes, food-grade waxes and cardboard boxes, among commodities,” Psihoules said.

Kreloff said present incentives like renewables identification numbers (RINs), predominantly favor landfilling.

“Despite the fact that methods like

aerobic digestion or composting result in reduced emissions and promote circular systems, they offer fewer incentives. Furthermore, it’s crucial to future-proof the industry. Our existing infrastructure isn’t equipped to handle green hydrogen, hindering potential progress due to the current framework in place,” Kreloff said. “Expect sustained accelerated expansion in organic recycling. Additionally, it’s essential to maintain persistent scrutiny on the incineration and landfill sectors, aiming to guarantee cleaner air, water and soil for our communities.”

As some landfills reach end of life and the waste is too expensive to transport to other area landfills, especially in densely populated areas, the waste and recycling industry will see an increase desire to move toward a WTE solution.

“The recycling industry and WTE will always go hand-in-hand. Many jurisdictions are single bin curbside collection – even with curbside recycling, inevitably recyclables make it to the tipping floor and waste bunker of a WTE plant,” Pierson said. Any non-combustible material will leave the furnace as bottom ash. With metal separation downstream of the bottom ash discharger, including a rotary drum electromagnet and eddy current separator, over 95 percent of the metals that enter the furnace are able to be recovered, which would have otherwise been landfilled.

“Viewing the offset of greenhouse gas that would be emitted while producing the recovered metals, coupled with CO2 capture, WTE plants of the future can be a net negative CO2 emitter,” Pierson said. “It is likely that many of the future WTE plants will be driven to lower stack emissions and potentially include CO2 capture as well.”

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METALS

August 2023 crude steel production

World crude steel production for the 63 countries reporting to the World Steel Association (worldsteel) was 152.6 million tonnes (Mt) in August 2023, a 2.2 percent increase compared to August 2022.

Crude steel production by region

Africa produced 1.5 Mt in August 2023, up 16.1 percent on August 2022. Asia and Oceania produced 115.7 Mt, up 3.5 percent. The EU (27) produced 9.1 Mt, down 4.4 percent. Europe, Other produced 3.4 Mt, down 3.2 percent. The Middle East produced 2.8 Mt, down 16.0 percent. North America produced 9.2 Mt, down 2.6 percent. Russia & other CIS + Ukraine produced 7.5 Mt, up 10.7 percent. South America produced 3.4 Mt, down 8.1 percent.

Top 10 steel-producing countries

China produced 86.4 Mt in August 2023, up 3.2 percent on August 2022. India produced 11.9 Mt, up 17.4 percent. Japan produced 7.1 Mt, down 2.9 percent. The U.S. produced 7.0 Mt, up 1.1 percent. Russia is estimated to have produced 6.4 Mt, up 8.9 percent. South Korea produced

5.6 Mt, down 5.9 percent. Germany produced 2.8 Mt, down 1.0 percent. Turkey produced 2.8 Mt, down 2.9 percent.

Brazil produced 2.7 Mt, down 5.9 percent. Iran produced 1.6 Mt, down 24.1 percent.

Top steel-producing countries				
	Aug 2023 (Mt)	% change Aug 23/22	Jan-Aug 2023 (Mt)	% change Jan-Aug 23/22
Africa	1.5	16.1	10.6	8.2
Asia and Oceania	115.7	3.5	944.8	2.0
EU (27)	9.1	-4.4	85.7	-9.8
Europe, Other	3.4	-3.2	27.2	-10.6
Middle East	2.8	-16.0	29.0	0.4
North America	9.2	-2.6	73.1	-3.8
Russia & other CIS + Ukraine	7.5	10.7	58.8	0.8
South America	3.4	-8.1	27.1	-7.5
Total 63 countries	152.6	2.2	1,256.4	0.2



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Worldsteel short range outlook for steel demand

The World Steel Association (worldsteel) released an update of the Short Range Outlook (SRO) for 2023 and 2024. Worldsteel forecasts that steel demand will grow by 1.8 percent in 2023 and reach 1,814.5 Mt after contracting by 3.3 percent in 2022. In 2024, steel demand will see a further increase of 1.9 percent to 1,849.1 Mt.

Commenting on the outlook, Máximo Vedoya, chairman of the worldsteel Economics Committee, said, "Steel demand has been feeling the impact of the high inflation and interest rate environment. Since the second half of 2022, the activities of steel using sectors have been cooling sharply both for most sectors and regions as both investment and consumption weakened. The situation continued into 2023, particularly affecting the EU and the US. Considering the delayed effect of the tightening monetary policy, we expect steel demand recovery in 2024 to be slow in the advanced economies. Emerging economies are expected to grow faster than developed economies, but the performance of emerging economies continues to diverge, with emerging Asia maintaining resilience.

"We expect the situation in China's property market will stabilize in the latter part of the year and China's steel demand will record slight positive growth thanks to government measures. The 2024 outlook for China remains uncertain depending on the policy directions to tackle the current economic difficulties. We note that the Chinese economy is in a structural transition phase that may add volatility and uncertainty. Other uncertainty is linked to regional conflicts and unrest such as in Russia and Ukraine, Israel and Palestine and elsewhere. This could contribute to rising oil prices and further geo-economic fragmentation, both of which are downside risks.

"It is worth noting that despite the weakening of construction activities due to high interest rates, infrastructure investment is showing positive momentum in many regions, even in the advanced economies, reflecting the effect of decarbonisation efforts."

The global economic outlook continued to worsen under the influence of monetary tightening that hurt consumption and investment alike. However, inflation started to moderate in 2023 thanks to the slowing economy, which may allow the ending of the monetary tightening cycles in 2024. However, the war against inflation is not over and continues to be threatened by multiple factors: persistent core inflation, a tight job market and rising oil prices.

The construction sector has been negatively affected by the high interest rates and high-cost environment, especially the residential sector. However, infrastructure investment remained positive and is cushioning the impact to some extent. Despite the easing of supply chain bottlenecks, the manufacturing sector continues to slow under weakening demand. The consumer durables sector has been particularly affected. But, the recovery in auto production will continue in 2023. This is helped by the order backlogs and easing of supply chain bottlenecks, allowing high growth

in many regions. The sector is expected to decelerate in 2024.

China

The depression in the property market that continued into 2023 is weighing on the economy, leading to an unexpected slowing of the Chinese economy. Falling housing sales have led to financial troubles for major real estate developers, generating concerns about the health of the Chinese economy. The situation is expected to stabilise in the latter part of 2023 as the Chinese government has taken some measures to stabilise the economy since July.

Almost all steel using sectors have shown signs of weakening since the second quarter. Key real estate indicators like land sales, housing sales and new construction starts continued to fall in 2023. The decline in new starts in 2021-2022 has suppressed construction activities and will continue to suppress steel demand in 2024.

On the other hand, the growth momentum of infrastructure investment continued in 2023, thanks to the government's efforts to boost construction. The government may kick off some additional infrastructure projects. As a result, infrastructure investment in both 2023 and 2024 is expected to remain moderately positive.

Manufacturing growth momentum also weakened, but maintained moderate growth in 2023, with positive growth in auto production and strong growth in home appliances. The growth momentum in manufacturing may weaken further due to deteriorating external markets.

It is expected that steel demand in 2023 will record 2.0 percent growth supported by infrastructure investments and stabilization in the property sector. The outlook for 2024 is uncertain. The real estate market and exports will continue to exert negative pressure on steel demand and steel demand might contract in the absence of additional government support measures. However, under the assumption that the government will introduce additional measures to support the economy, steel demand in 2024 may sustain the level of 2023. There is a downside risk for both 2023 and 2024 if the stimulus effect is weaker than expected.

European Union and United Kingdom

While the EU economy turned out to be more resilient than expected to the energy crisis brought about by the Russia-Ukraine war, high interest rates and energy costs are putting a heavy toll on manufacturing activities. The recovery of the auto sector continues, though. Despite the continued recovery, auto production is not expected to reach the pre-pandemic level in 2024. Residential construction is also affected by high interest rates, materials costs, and labour shortages, while the momentum in infrastructure investment remains stable. Germany is in a particularly difficult situation, with both a manufacturing recession and a housing crisis. With monetary policy expected to remain tight, a rebound in real demand is not foreseen for 2024, but as destocking cy-



cles end, a technical rebound will enable positive growth in steel demand in 2024.

After a fall of 7.8 percent in 2022, steel demand is expected to fall by 5.1 percent in 2023. Growth of 5.8 percent is expected in 2024.

United States

Despite the resilience of the U.S. economy to steep interest hikes, steel using sectors are experiencing the impact. Particularly affected is residential construction, which is expected to contract in 2023 and 2024. However, the commercial building sector is showing robust recovery thanks to reshoring activities. Growth in the infrastructure sector is also being supported by the 2022 Infrastructure Law and Inflation Reduction Act (IRA). Manufacturing has been also slowing, but the automotive sector is expected to continue its post-pandemic recovery. The lagged effect of tight monetary policy points to downside risk for 2024.

After a fall of 2.6 percent in 2022, steel demand is expected to decline by 1.1 percent in 2023 and then grow by 1.6 percent in 2024.

Japan

Labor shortages and rising costs are leading to sluggish growth in construction activities, but manufacturing steel demand is expected to show moderate growth in both 2023 and 2024, helped by the recovery of automotive production (the weak yen or external markets exert a limited influence on steel using sectors as Japan is basically a supply-side constrained economy).

After a fall of 4.2 percent in 2022, demand is expected to decrease by 2.0 percent in 2023 and then grow by 0.6 percent in 2024.

South Korea

Recovery from the flood damages in 2022 and small but positive growth in construction after years of contraction will allow a recovery in steel demand in 2023, but it will be only moderate due to overall weakness in manufacturing, except for automotive.

Following a contraction of 8.5 percent in 2022, Korea's steel demand is expected to show growth of 3.3 percent in 2023 and 1.1 percent in 2024.

The Indian economy remains stable

against the pressure of the high interest rate environment, and India's steel demand is expected to continue its high growth momentum. Growth in India's construction sector is driven by government spending on infrastructure and recovery in private investment. Infrastructure investment will also support the capital goods sector growth. Healthy growth momentum will continue in automotive. The consumer durables sector is the only sector that is underperforming due to higher inflation/interest rates that constrain discretionary spending. It will improve in 2024 with festive season spending and progress in the Production Linked Investment (PLI) Schemes.

After growth of 9.3 percent in 2022, steel demand is expected to show healthy growth of 8.6 percent in 2023 and 7.7 percent in 2024.

Russia and other CIS + Ukraine

After performing better than expected in 2022, with only a minor contraction in GDP thanks to massive government stimulus measures, the Russian economy is expected to record a small positive growth in 2023, helped by oil revenues and adjustments of the economy to the sanctions. Steel demand is also expected to recover moderately in 2023. But in 2024, Russia will see a deteriorating economic environment with currency depreciation, labour shortages, and supply chain disruptions. Industrial production will deteriorate due to reduced access to modern technologies and continuous restrictions on the import of spare parts.

Despite the continuation of the war, the steel use situation in Ukraine is for stabilization and improvement. Since March 2023, steel using sectors have shown an upward trend amid a low base of comparison. Construction activities are helped by relocation of businesses, construction of housing for internally displaced persons, restoration of damaged infrastructure, and development of new logistics routes.

Forecasts for 2023-2024 have been revised upwards for both Russia and Ukraine compared to the April 2023 outlook, but significant revisions are possible depending on the course of the war.

METALS

August steel shipments up 1.5 percent

The American Iron and Steel Institute (AISI) reported that for the month of August 2023, U.S. steel mills shipped 7,663,767 net tons, unchanged from the 7,675,344 net tons shipped in August 2022. Shipments were up 1.5 percent from the 7,550,446 net tons shipped in the previous month, July 2023. Shipments year-to-date in 2023 are 59,530,059 net

tons, down 2.9 percent vs. 2022 shipments of 61,324,568 net tons for eight months.

A comparison of shipments year-to-date in 2023 to the first 8 months of 2022 shows the following changes: hot rolled sheet, up 6 percent, cold rolled sheet, down 1 percent and corrosion resistant sheet, down 1 percent.

Novelis partners with Southern Company in pursuit of decarbonization goals

Novelis Inc., a sustainable aluminum solutions provider and leader in aluminum rolling and recycling, and Southern Company, have partnered on decarbonization efforts. Their initial focus is on Novelis' new Bay Minette, Alabama, plant, which aims to be carbon neutral for scope 1 and 2 greenhouse gas emissions. The recycling and rolling plant is currently under construction to help meet the growing demand for more sustainable beverage packaging and will support the automotive industry in North America, including the increase in electric vehicle production.

Novelis will work with Southern Company subsidiary Alabama Power to provide the Bay Minette project with renewable energy to reduce its scope 2 greenhouse gas emissions.

By participating in Alabama Power's Renewable Subscription Program, Novelis will directly support the creation of two, new 80-megawatt solar power generation plants in Alabama that will cover over half of the Bay Minette facility's renewable energy needs while avoiding 192 kilotons of CO2 emissions per year.

Novelis and Southern Company will also collaborate to advance new technologies to reduce Novelis' Scope 1 carbon emissions, including hydrogen fuels, carbon capture, energy storage and electrification of thermal processes. Through their corporate venture and R&D teams, Novelis and Southern Company are exploring projects for the Bay Minette facility, as well as other Novelis sites in North America.

Nucor and Helion to develop fusion power plant

Nucor Corporation announced a collaboration with fusion power company, Helion to develop a 500 MW fusion power plant. This project will offer baseload zero-carbon electricity from fusion directly to a Nucor steelmaking facility. Nucor and Helion are working together to set a firm timeline and are committed to beginning operations with a target of 2030. Nucor is making a direct investment of \$35 million in Helion to accelerate fusion deployment in the United States. This is the first fusion energy agreement of this scale in the world.

"Nucor continues to position itself as a

leader in developing clean energy solutions to decarbonize the industrial sector. This agreement with Helion, along with investments in clean energy, can change the entire energy landscape and change the world, embracing a clean energy future we could have hardly imagined a few years ago," said Leon Topalian, chair, president, and chief executive officer of Nucor Corporation. Helion has achieved remarkable milestones, including the construction of six working fusion prototypes and being the world's first private fusion company to achieve 100 million degree plasma temperatures.

Steel import permit applications estimated at 20 percent

Based on the Commerce Department's most recent Steel Import Monitoring and Analysis (SIMA) data, the American Iron and Steel Institute (AISI) reported that steel import permit applications for the month of September totaled 2,289,000 net tons (NT). This was a 0.7 percent increase from the 2,272,000 permit tons recorded in August and a 0.5 percent increase from the August final imports total of 2,279,000. Import permit tonnage for finished steel in September was 1,659,000, down 10.8 percent from the final imports total of 1,860,000 in August. For the first 9 months of 2023 (including September SIMA permits and August final imports), total and finished steel imports were 21,946,000 NT and 16,807,000 NT, down 9.4 percent and 14.5 percent, respectively, from the same period in 2022. The estimated finished steel import market share in September was 20 percent and is 22 percent year-to-date (YTD).

Steel imports with large increases

in September permits vs. August final imports include black plate (up 70 percent), hot rolled sheets (up 52 percent), ingots and billets and slabs (up 50 percent), heavy structural shapes (up 18 percent) and stainless pipe and tube (up 18 percent). Products with significant year-to-date (YTD) increases vs. the same period in 2022 include cut lengths plates (up 24 percent), standard rails (up 16 percent), ingots and billets and slabs (up 13 percent), oil country goods (up 11 percent) and line pipe (up 10 percent).

In September, the largest steel import permit applications were for Canada (526,000 NT, down 4 percent from August final), Brazil (451,000 NT, up 116 percent), Mexico (354,000 NT, down 3 percent), South Korea (338,000 NT, up 33 percent) and Japan (73,000 NT, down 23 percent). Through the first nine months of 2023, the largest suppliers were Canada (5,245,000 NT, no change), Mexico (3,334,000 NT, down 21 percent) and Brazil (3,122,000

AR Scrap Metals MarketWatch						
Commodity		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
FERROUS						
#1 Bushelings	per gross ton	\$385.00	\$387.00	\$394.00	\$398.00	\$409.00
#1 Bundles	per gross ton	389.00	389.00	380.00	389.00	402.00
Structural	per gross ton	335.00	359.00	357.00	360.00	395.00
#1 & #1 Mixed Steel	per gross ton	310.00	312.00	310.00	340.00	350.00
Crushed Auto Bodies	per gross ton	210.00	210.00	215.00	218.00	250.00
Shredded Auto Scrap	per gross ton	389.00	390.00	391.00	398.00	400.00
NON FERROUS						
#1 Copper Bare Bright	per pound	3.45	3.45	3.42	3.50	3.45
#2 Copper Wire & Tubing	per pound	3.23	3.21	3.16	3.23	3.25
Aluminum Cans	per pound	.70	.70	.72	.71	.74
Al/Cu Radiators	per pound	1.70	1.71	1.73	1.75	1.80
Aluminum Radiators	per pound	.53	.55	.57	.58	.62
Heater Cores	per pound	1.51	1.52	1.51	1.52	1.53
Stainless Steel	per pound	.61	.60	.60	.61	.63

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

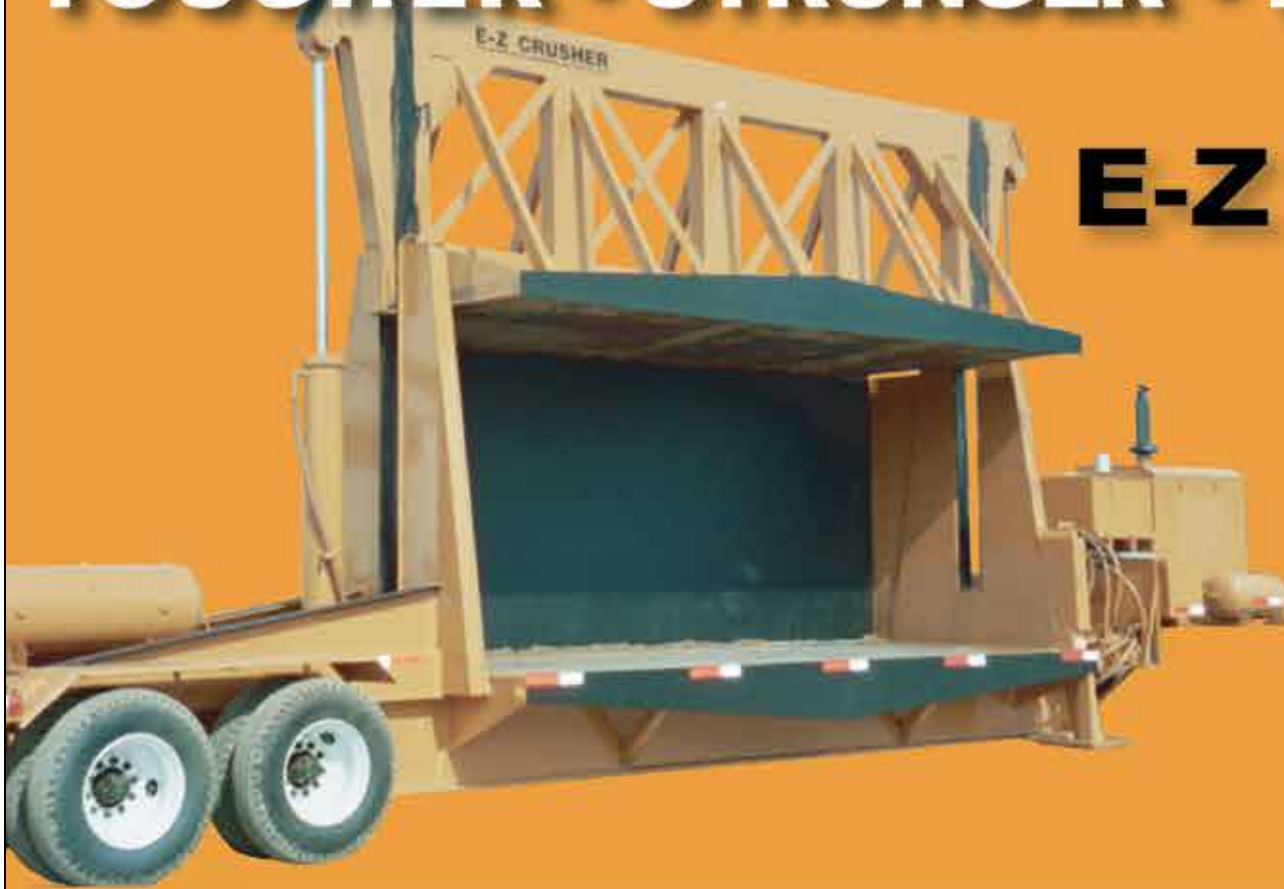
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U.S. Imports of Steel Mill Products by Country of Origin (thousands of net tons)

U.S. Imports of Steel Mill Products by Country of Origin (thousands of net tons)									
COUNTRY	AUG. 2023 PRELIM	JULY 2023 FINAL	% VAR. AUG. VS. JULY	YTD 2023 (8 MON.)	YTD 2022 (8 MON.)	% VAR. 2023 VS. 2022	SEPT. 2022 TO AUG. 2023	SEPT. 2021 TO AUG. 2022	% VAR.
Canada	547	531	3.0%	4,719	4,710	0.2%	6,868	7,002	-1.9%
Mexico	365	290	25.5%	2,980	3,899	-23.6%	4,383	5,775	-24.1%
Brazil	209	384	-45.5%	2,671	1,984	34.7%	3,255	2,987	9.0%
South Korea	254	158	61.1%	1,728	1,938	-10.8%	2,607	2,903	-10.2%
Japan	95	122	-22.7%	824	855	-3.6%	1,230	1,247	-1.4%
Germany	78	104	-24.6%	713	742	-3.9%	1,097	1,142	-3.9%
Taiwan	44	36	20.4%	437	755	-42.1%	720	1,102	-34.6%
China	40	28	39.5%	455	441	3.3%	666	647	2.9%
Vietnam	92	51	80.8%	397	766	-48.2%	567	1,296	-56.3%
Italy	31	66	-52.2%	357	262	36.1%	546	336	62.6%
Netherlands	51	50	1.0%	329	382	-13.7%	542	630	-13.9%
Algeria	90	30	203.0%	445	426	4.3%	527	611	-13.6%
Turkey	7	14	-54.1%	224	761	-70.6%	463	1,220	-62.0%
India	19	14	41.1%	255	482	-47.1%	457	711	-35.7%
Australia	13	26	-51.3%	266	131	-103.6%	434	192	126.4%
All Other	343	466	-26.4%	2,855	3,445	-17.1%	4,162	5,446	-23.6%
Total	2,277	2,371	-4.0%	19,655	21,978	-10.6%	28,526	33,248	-14.2%
memo EU-27	300	433	-30.8%	2,817	2,898	-2.8%	4,329	4,212	2.8%

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WASTE

Recology diverts 1.3 million tons from landfills

Recology released its Sustainability Report, which showcases the company's commitments to decrease greenhouse gas emissions, support a diverse workforce, and partner with local communities to advance resource recovery and help slow climate change.

The report, based on 2022 data, shows:

- For every ton of greenhouse gases emitted by the company's operations, Recology and its partners avoided 10 times more greenhouse gas emissions through recycling and composting activities.
- Recology's collection and processing activities supported the recovery of more than 1.3 million tons of recyclable and compostable materials, including more than 684,000 tons for composting at Recology facilities – a 12 percent year-over-year increase.
- Recology achieved its goal of powering its fleet with more than 90 percent renewable or alternative energy sources.
- Recology facilities ran on 90 percent renewable or carbon-free electricity.

"As the largest 100 percent employee-owned company in our industry, we owe our success to a passionate workforce that's committed to meeting the ambitious goals we set in our pursuit of a world without waste," said Recology chief executive officer, Sal Coniglio.

Recology announced new, five-year, sustainability targets as part of the report.

By 2028, Recology has committed to powering its facilities with 100 percent renewable or carbon-free electricity and using 75 percent collected landfill gas to generate renewable energy.

Coniglio said Recology will continue to make progress toward its goals by, for example, opting into clean electricity service levels, implementing solar installations at its facilities, and pursuing renewable energy projects at its landfills.

Recology pioneered curbside food scrap collection for composting in North America and will continue to pursue innovations in this important field to advance the circular economy and combat climate change, Coniglio said. Composting keeps materials out of

landfills, helps local farms grow healthy food and save water, and reduces greenhouse gas emissions.

Recology owns and operates eight composting facilities in California and Oregon including two of the largest on the West Coast. The company is helping cities up and down California, including Los Angeles and San Francisco, comply with SB 1383, the statewide law requiring all municipalities to reduce landfilling of compostable materials by 75 percent.

Other highlights from the company's sustainability report include:

- 10 times more owned and operated recovery facilities than active landfills
- 44 percent reduction in fleet fuel emissions over the last three years
- 50 percent of landfill gas collected is used to generate renewable electricity
- More than 41,500 MWh of renewable energy produced by landfill gas conversion engines — enough to power 2,270 US households for a year
- \$60 million invested in advanced technologies to upgrade sorting capabilities in Recology recycling plants, also known as material recovery facilities (MRFs)
- 2022 greenhouse gas emission inventory verified by an independent third-party
- More than 60 percent of Recology stock is beneficially owned by employee-owners who are women and/or members of an ethnic minority group
- Recology also recently completed its first "materiality assessment," which identified the environmental, social, and governance (ESG) topics most important to the company's stakeholders and business. Coniglio said the main priorities identified—such as improving recovery and circularity, helping address climate change, protecting the health and safety of employee-owners, and upholding high standards of corporate responsibility – will play key roles in the company's sustainability strategy.

Chicago Teamsters ratify five year contract with WM

Members of Teamsters Local 731 at Waste Management, Inc. (WM) in Chicago have voted by an overwhelming 2-1 margin for a strong new contract. The five-year agreement is being hailed as the richest ever negotiated by the 450-worker group and contains numerous improvements to benefits, contract language and working conditions.

"We were successful in these negotiations because we were united and determined at the table. I've been a proud union member for over 30 years, and the future has never been brighter," said Glenda

Schaller, a WMI driver. Local 731 is currently negotiating agreements for more than 2,500 waste workers at several other employers, including Republic Services, Waste Connections, Lakeshore Recycling Systems, and several other private commercial waste companies for the city. At each employer, the Teamsters are fighting for higher wages, improved working conditions, and language guaranteeing workers the right to honor picket lines in the new contracts. The WMI contract victory marks the first group of workers to reach a deal in the Chicagoland area.

Waste Pro gives \$100,000 to employees marking 20 years of service

Waste Pro founder and executive board chairman John Jennings and president and chief executive officer Sean Jennings surprised 10 employees with breakfast, a plaque, and a \$10,000 bonus, thanking them for their 20 years of dedication and service.

Among the employees honored during the celebration were Jeannie Amaro – Sanford, Florida customer service supervisor, Dave Black – Flager County, Florida, roll-off driver, Derrick Davis – Daytona, Florida residential route supervisor, Tim Dolan – vice president of government affairs, Christopher Dudley – Fanning Springs, Florida residential driver, Nancy

Finley – Northeast Florida sales representative, Russell Mackie – southeast Florida vice president of business development, Cindi Tiger – Cocoa, Florida office supervisor, Garrey Thompson – Ft. Pierce, Florida roll-off driver, and Denis Zeledon – Daytona, Florida grapple driver.

Jennings shared personal stories of each recipient, all of whom he has developed close working relationships with over the past two decades. "These folks have made Waste Pro what it is today. We are a 100-year company, and these dedicated Waste Pros have helped with our tremendous growth as we look towards continued success in the future."



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AUTO

Organize your COA to CYA: Most small business owners don't read their P&L

Contributed by: PAUL D'ADAMO

Most small business owners are not certified accounting or financial professionals, so they typically don't prepare the financials at their own business. They either hire people internally or outsource the work. However, they still need to be able to know what data being processed, to ensure their reports are factual and functional. Most importantly, we need solid accounting reports to run our operations profitably. For some, it might be in preparation for a possible sale. This article focuses on the profit and loss (P&L). Once your chart of accounts (COA) is in order, your balance sheet will be more effective.

Technical definition (courtesy of Investopedia): The COA is an index of all financial accounts in a company's general ledger. It is an organizational tool that lists by category and line item, all the company's financial transactions during a specific accounting period. These categories feed into your business's two most important financial statements: the P&L and balance sheet.

The COA is the heart and soul of a P&L. As someone who sold their business to a publicly traded company, our P&L spoke volumes in terms of the type of company we were running. In other words, if your COA is a mess, your P&L will be unreadable and, therefore, useless in allowing owners to think critically and factually to make short and long-term decisions.

The Importance of Categories

Categories are critical in the COA. Take sales, for example; You will naturally have a category for parts sales and any other line items related to parts sales. Next, you should have a category for Cores, Commodities, and Recalls.

When categorizing your expenses, put every expense associated with employees into a labor category. There are typically many more expense categories like advertising, insurance, maintenance, and repairs. Organize your categories, prioritize them, and list them accordingly based on their cost to the business. Labor is our most significant expense, so list that first. Do not sort them alphabetically! We want owners to first see their largest expense categories and not get side-tracked.

Time is Not On Your Side

Whether you are considering selling your business or not, get your financial house in order by hiring a CPA to assist in reorganizing your COA. The second recommendation would be to hire a professional appraiser to assess the value of your operation. It's a wake-up call to measure your estimate of what the business is worth against a professional opinion. Most companies will look for financial statements from the last three to five years. Consistency from year to year is essential.

PLASTICS

Aquapak joins WRAP and UK Plastic Pact

Aquapak Polymers Ltd. specializing in polymer based material technologies that can deliver both performance and environmental responsibility at scale, has joined Waste & Resources Action Program (WRAP), the climate action NGO which works around the globe to tackle the causes of the climate crisis and give the planet a sustainable future.

Aquapak will also join the UK Plastics Pact, which brings together businesses from across the entire plastics value chain with UK governments and NGOs to tackle the issue of plastic waste. Pact members are committed to eliminating problematic plastics, reducing the total amount of packaging on supermarket shelves, stimulating innovation and new business models

and helping to build a stronger recycling system in the UK.

Aquapak has developed and commercialized Hydropol™, a highly functional, specialty environmental polymer that allows product design to support the circular economy. It is designed to be an alternative to traditional plastics, offering their versatility and functionality, but without harming the environment.

As an enabling technology, Hydropol can be used on its own or in combination with other materials to enhance recyclability, compostability and end-of-life options. Its material properties allow for scalability into diverse types of products and its solubility makes it easy to separate from other materials when recycling.

ISRI board to consider changes to recycled plastic specifications

The ISRI board of directors considered the following proposed changes to the Guidelines for Recycled Plastic that were approved by the ISRI Plastics Division at its Fall Board Meeting in Denver, Colorado:

Revised Specifications:

- PP Small Rigid Plastic
- Mixed Small Rigid Plastic
- Mixed Bulky Rigid Plastic

The full board may adopt, amend or reject the recommendations of the Division or table them pending further review. More information about the rules governing the

procedures from the addition, amendment, or withdrawal of ISRI's Specifications can be found in ISRI Specifications information. To submit comments, recommendations, or questions please contact ISRI chief economist Joe Pickard (jpickard@isri.org) or ISRI Senior Economist Bret Biggers (bbiggers@isri.org). If adopted or amended, there will be an open comment period for 30 days following the vote by the board.

These three proposed revisions combine nine expected specifications which reflect current trading in the marketplace.

APR publishes expanded Global Design Guidance Catalog

The Association of Plastic Recyclers (APR) recently expanded and updated the APR Global Design Catalog, a comprehensive resource to access the most current plastic packaging recyclability guidelines for countries and regions around the world.

Different countries and regions operate a variety of recycling collection and processing systems. Many of them oversee complex Extended Producer Responsibility (EPR) programs that hold manufacturers and suppliers accountable for the end-of-life fate of packaging materials. EPR programs in virtually all jurisdictions reference a local design for recyclability index to encourage companies to design more sustainable packaging.

APR's catalog saves time and resources for brands and packaging suppliers without global counterparts looking to comply with varying global standards. The catalog is a quick reference guide to stay up to date with global standards and facilitate more meaningful discussions with international counterparts.

"Package producers worldwide rely on the APR Design® Guide for Plastics Recyclability and the APR Global Design Catalog to create recyclable packaging," stated

Steve Alexander, APR president & chief executive officer. "Although the principles of recyclable package design are universal, recycling infrastructure, packaging trends, culture, and attitudes toward resource management vary regionally, even within each country."

The APR Global Design Catalog offers consolidated, easy access to regularly updated design for recyclability requirements for countries and regions around the world including Denmark, the European Union, France, Germany, Netherlands, South Africa, South Korea, Sweden, the United Kingdom, and the United States, with the recent additions of Chile and Italy. It covers recyclability criteria evaluations through an extensive list of design features for rigid PET, rigid HDPE, rigid PP, and flexible PE film packaging. One pack labeling guidance has been added as a new parameter being tracked for all countries.

"Recycling, along with reduction and reuse, are essential to tackling plastic waste and pollution," continued Alexander.

This is a FREE resource for all APR members. Non-members can subscribe to the guidance for an annual subscription fee.

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PLASTICS

Plastics Industry Association launches Recycling is Real Advocacy Campaign

The Plastics Industry Association (PLASTICS) has launched a new advocacy campaign called Recycling is Real, dedicated to promoting and defending plastic recycling in America. The campaign will provide content to help elected officials and policymakers understand that recycling is a vital link of the sustainability and circularity chain, enabling them to make more well-informed decisions.

The campaign has also been created in an effort to put an end to false narratives claiming that recycling doesn't happen or is a "myth." Anti-recycling organizations and their allies have created a coordinated campaign against plastic recycling in an effort to advance their anti-plastics agenda.

"Plastic recycling is very real, and it happens every single day across America," said PLASTICS' president and chief executive officer Matt Seaholm. "The

Recycling is Real campaign allows both the public and lawmakers to see for themselves the extraordinary role recycling plays in the circular economy, making it undeniable that recycling is not only effective but is a feasible and economical way to achieve our shared sustainability goals."

PLASTICS is committed to sustainability and ensuring plastic material remains in our circular economy, and out of the environment. Recycling is an integral part of achieving this goal. Recycling has come under attack from those who wish to reduce or eliminate the production of plastic altogether. Recycling is Real will show how recycling happens, where it happens and introduce the people who make it happen. This initial launch will spotlight recycling efforts taking place at Ultra-Poly, Placon, Novolex and MAAG.

Borealis and TotalEnergies launch Baystar JV polyethylene unit

Borealis and TotalEnergies celebrated the start-up of their Baystar joint venture's new 625,000 metric ton-per-year Borstar® polyethylene (PE) unit, which more than doubles the current production capacity at Baystar's site in Pasadena, Texas.

The \$1.4 billion unit completes the partners' integrated petrochemicals venture, includes the expanded Bayport PE facility, and the ethane cracker at the TotalEnergies Platform in Port Arthur, Texas.

The new PE unit, referred to as Bay 3, increases the Baystar site's total production to over one million tons per year, which includes two legacy polyethylene production units. Bay 3 features the state-of-the-art proprietary Borstar® 3G technology licensed in North America for the first time. Borstar technology delivers advanced value-added polymers with enhanced sustainability by enabling

light-weighting and the incorporation of greater amounts of post-consumer recycled materials in a variety of end products, serving the energy, infrastructure and consumer products industries.

"The arrival of Borealis' proprietary Borstar technology in North America by way of Baystar marks, in line with our owners' strategies, a crucial step for us in becoming a global leader in advanced and sustainable chemicals and material solutions," said Borealis chief executive officer, Thomas Gangl.

"After the inauguration of the ethane cracker unit in Port Arthur last year, the start-up of the new PE unit is the second milestone of this joint venture aimed at establishing Baystar as a fully integrated U.S. petrochemical player," said Bernard Pinatel, president, Refining & Chemicals, TotalEnergies.

Terracycle expands recycling partnership with Sanofi Consumer Healthcare

TerraCycle® is expanding the Gold Bond®, Cortizone-10®, and Selsun Blue® Recycling Program to become the Gold Bond®, ACT®, and Cortizone-10 Free Recycling Program. Now, the expansion offers customers a free and simple way to recycle ACT mouthwash packaging along with Gold Bond, Cortizone 10 and Selsun Blue packaging.

Developed in partnership with Sanofi Consumer Healthcare, makers of these brands, the expanded platform now enables customers to recycle ACT mouthwash plastic bottles, providing a sustainable solution for consumers whose curbside recycling programs don't accept #1 and #2 plastics.

Following is how the Gold Bond, ACT, and Cortizone-10 Free Recycling Program works:

1. Sign up at terracycle.com/en-US/brigades/sanofi.
2. Collect plastic packaging (plastic tubes, dark plastic bottles, tubs sticks, pumps and caps) from Gold Bond, ACT, Cortizone-10, and Selsun Blue products.
3. Ship the packaging to TerraCycle using a free, prepaid shipping label.
4. Earn recycling reward points for every shipment sent to TerraCycle.
5. Redeem points in the form of a donation to the consumer's chosen school or charity.

Once collected, the packaging is cleaned and separated by material type. The materials are then recycled into raw formats that can be remolded to make new products.

England bans single use plastics

A range of polluting single-use plastics will be banned in England, Thérèse Coffey, environment secretary announced.

The ban will include single-use plastic plates, trays, bowls, cutlery, balloon sticks, and certain types of polystyrene cups and food containers.

According to estimates, England uses 2.7 billion items of single-use cutlery – most of which are plastic – and 721 million single-use plates per year, but only 10 percent are recycled.

Effective October 1, these products will be unavailable to all and this includes retailers, takeaways, food vendors and the hospitality industry.

Plastic pollution takes hundreds of years to break down and inflicts serious damage to our oceans, rivers and land. It is also a major source of greenhouse gas emissions, from the production and manufacture of the plastic itself to the way it is disposed.

"We all know the absolutely devastating impacts that plastic can have on our environment and wildlife. We have listened to the public and these new single-use plastics bans will continue our vital work to protect the environment for future generations. I am proud of our efforts in this area: we have banned microbeads, restricted the use of straws, stirrers and cotton buds and our carrier bag charge has successfully cut sales by over 97 percent in the main supermarkets", said Coffey.

The Government is also carefully considering further measures around other commonly littered and problematic plastic items, including wet wipes, tobacco filters and sachets, following the call for evidence on this issue.

Future steps that could be explored include banning plastic in these items, and mandatory labeling on packaging to help consumers dispose of these items correctly. A new research project will also look into the impact of wet wipes on blockages in the sewage system, and will inform any future policy actions.

The ban will not apply to plates, trays, and bowls that are used as packaging in shelf-ready pre-packaged food items, as these will be included in our plans for an extended producer responsibility scheme – which will incentivize producers to use packaging that can be recycled and meet higher recycling targets. For example, this would include pre-packaged salad bowls and bowls filled with food at the counter of a takeaway.

Through the Environment Act, the Government is bringing in further measures to tackle plastic pollution and litter. This includes a deposit return scheme for drinks containers to recycle billions more plastic bottles and stop them being landfilled, incinerated, or littered via a small deposit on drinks products to incentivize people to recycle, and plans for consistent recycling collections for every household and business in England.

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PAPER

Life cycle assessment reinforces corrugated packaging industry's sustainability leadership



The corrugated packaging industry has achieved substantial reductions in the environmental impacts of a corrugated cardboard box, according to a new life cycle assessment (LCA) recently released. The study shows a 50 percent per unit reduction in greenhouse gas emissions between 2006 and 2020, tackling the most urgent and predominant causes of our changing climate.

The LCA, conducted for the Corrugated Packaging Alliance (CPA) by Anthesis and the National Council for Air and Stream Improvement with third-party review by the Athena Institute, analyzed the cradle-to-grave life cycle of an average corrugated cardboard box made in the U.S. in 2020. It estimated impacts to land, air and water based upon the new materials, manufacturing of those materials into products, the distribution/transportation and use of the products, and the end-of-life.

Meaningful reductions were also achieved in ozone depletion (13 percent), energy usage (13 percent), water usage (18 percent), acid rain (41 percent), smog (44

percent), respiratory effects (54 percent) and eutrophication, which leads to algae blooms and dead zones in bodies of water (30 percent).

The industry's progress was attained through energy improvements, strong recycling infrastructure, sustainably managed forests, and an ongoing commitment to improvement. The industry continues to shift to cleaner-burning fuel, has increased its participation in a greener U.S. electric grid and made investments in energy efficiency.

The introduction of new, fresh fibers from sustainably managed forests drives the removal of carbon dioxide from the atmosphere. The use of old corrugated containers (OCC) has also contributed to the avoidance of carbon dioxide and methane emissions from landfills. This combination of both new, fresh fibers, and recycled fibers maximizes fiber reuse and enables circularity. Much of this progress is also driven by the sustainability commitments of companies in the industry.

"Sustainable practices are at the foundation of the paper and wood products industry," said Heidi Brock, AF&PA president & chief executive officer. "Our industry has a long track record of sustainability leadership, and we are committed to making continued progress on quantifiable sustainability goals as part of the Better Practices, Better Planet 2030 initiative. This life cycle assessment reflects a longstanding commitment to sustainable manufacturing furthering the circular nature of our industry."

AF&PA releases paper reports

The American Forest & Paper Association released its August 2023 U.S. paper reports.

Printing-Writing

According to the report, total printing-writing paper shipments decreased 20 percent in August compared to August 2022. U.S. purchases of total printing-writing papers decreased 33 percent in July compared to the same month last year. Total printing-writing paper inventory levels decreased 5 percent when compared to July 2023.

U.S. shipments increased in all three major P-W grades (UFS, CFS and MECH) when compared to July, with uncoated free sheet papers recording the greatest increase by volume of approximately 33,000 tons. Net imports in all 3 major grades decreased in July compared

to the same month last year. July year-to-date U.S. purchases by volume decreased 22 percent compared to the same period last year.

Packaging Papers

Total packaging papers & specialty packaging shipments in August decreased 4 percent compared to August 2022. They were down 3 percent when compared to the same 8 months of 2022.

- Shipments of the biggest subgrade in bleached packaging papers – food wrapping – were 25,900 short tons for the month of August, down 16.4 percent year-to-date.
- The unbleached packaging papers operating rate was 83.7 percent, down 9.6 points from August 2023 and down 9.4 points year-to-date.

BUSINESS BRIEFS

Vianode welcomed Straube as new CEO

■ Vianode, a Norwegian producer of advanced battery materials with a greener footprint, has hired Burkhard Straube as their new chief executive officer.

Together with the leadership team and wider Vianode organization, the new chief executive officer will have a sharp focus on addressing the growing market opportunity for advanced battery materials while furthering the sustainable transformation of the EV industry with Vianode's innovative products.

Straube comes from the position of president of the Graphite Solutions Business Unit at SGL Carbon, a position he has held since 2015. He brings more than 30 years of international leadership.

Meridian Waste acquires Patterson TnWaste Hauling

■ Meridian Waste Tennessee, LLC, an integrated, non-hazardous solid waste services company, has acquired Patterson TnWaste Hauling to densify and expand the company's roll off hauling footprint the Knoxville region, and fortify its disposals volumes received at its two construction and demolition landfills, including Poplar View Landfill and Riverside Landfill.

The asset purchase includes 21 collection vehicles and approximately 800 containers. The commercial driver's license drivers will transition to Meridian Waste. The owners will continue their dump trucking operations.

BluMetric appoints new CFO

■ BluMetric Environmental Inc., a full service environmental consulting and engineering cleantech firm, has appointed Dan Hilton to the role of chief financial officer (CFO) subject to TSX Venture Exchange approval.

Hilton has a proven track record as a finance leader in both fast-growing and established technology companies. He was most recently CFO at Fully Managed Inc. (formerly Careworx), where he played a strategic role on the executive team and board. He successfully contributed to the growth of the managed IT services business, overseeing its expansion to over 500 employees and ultimately orchestrating its profitable sale in 2022.

Before joining Fully Managed Inc., Hilton served as CFO of Datawind Ltd. and Enablence Technologies Inc. He currently holds board positions at Clarity IOT Services & Technology Inc. and UpSnap Inc.

Effective October 1, 2023, the board granted options for 400,000 common shares to Hilton, pursuant to his employment agreement. The options vest over three years and are exercisable into common shares of BluMetric at a price of \$0.30 per share for five years.

Two men were driving home one night when one asked the other to check if the car's turning signals were working. He promptly stuck his head out the window and said: "Yes, no, yes, no, yes, no, yes, no."



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BUSINESS BRIEFS

Hendrickson acquires Brunner

■ Hendrickson acquired Brunner International Inc., Medina, New York and Brunner Manufacturing and Sales LTD. based in Niagara Falls, Ontario, Canada. Brunner is a business that manufactures components for the commercial vehicle, bus and trailer markets.

Brunner's primary product lines include brake shoes and s-cams. These products complement Hendrickson's primary business of designing and manufacturing suspension systems.

The Brunner product brand will be kept and used going forward. Brunner will operate as a division of Hendrickson Brake and Wheel End and its approximately 325 employees will become employees of Hendrickson.

Wieckowski named CEO Bosch Rexroth

■ Bosch Rexroth announced that Erwin Wieckowski, P.Eng. has been named the new president and chief executive officer of Bosch Rexroth North and Central America, based in Charlotte, North Carolina.

The role had been performed on an interim basis by Reinhard Schaefer, in addition to his role as a member of the divisional board of management with responsibility for manufacturing. Schaefer will remain in the region to support the transition.

Aquapak appoints Tom Barrett as COO

■ Aquapak Polymers Ltd, has appointed Tom Barrett as chief operating officer based at the firm's main manufacturing site in Birmingham, UK. He will be responsible for supporting the expansion of Aquapak as it develops its portfolio of products and their applications, which provide a planet-friendly alternative to conventional plastics.

Barrett has a successful track record in operations having worked for multi-site businesses with international supply chains. He held the director of operations role at aerospace business, Sigma, for 15 years, and was at Rical Group for 6 years.

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The mounting e-waste challenge

by MAURA KELLER

mkeller@americanrecycler.com

The speed at which technology advances and consumers purchase and replace electronic devices is staggering. As a result, the issue of e-waste management has come to the forefront as industry experts grapple with the exponential amount of e-waste entering the recycling and waste stream both in the U.S. and globally.

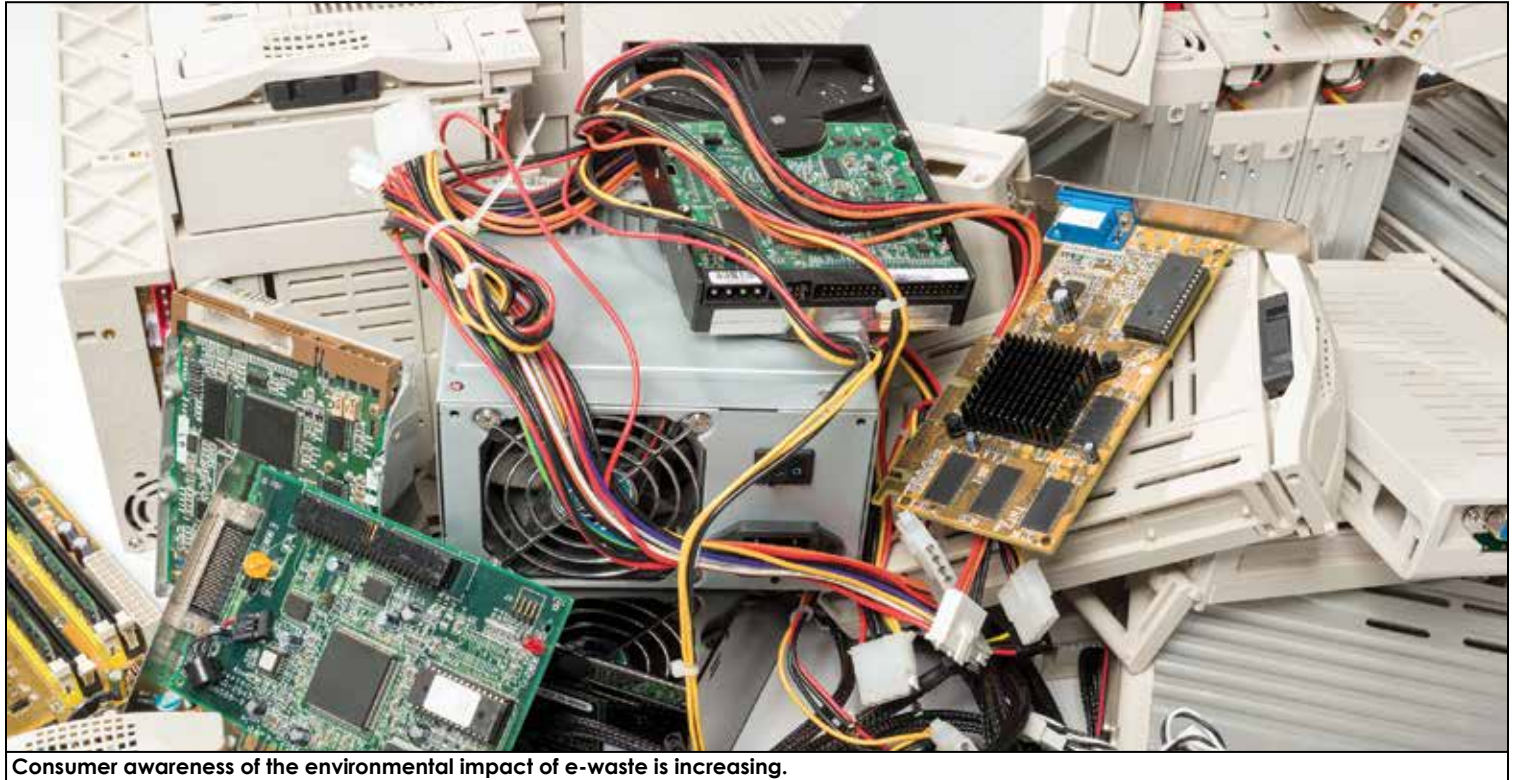
Brian Bilbruck, chief executive officer at Captjur, said e-waste has continued to be one of the fastest growing waste streams in the U.S. as the recycling rate for e-waste has remained relatively low compared to other recyclable materials like paper and plastic.

“Many people still dispose of their electronic devices in landfills, contributing to environmental pollution. Regarding legislation and regulations, various states have implemented or are considering legislation to address e-waste, including extended producer responsibility (EPR) laws,” Bilbruck said. “These laws shift some of the responsibility for recycling e-waste from consumers to manufacturers, which can incentivize companies to design products that are easier to recycle and develop programs that help in the recycling of these products.”

Kristy Ferguson, vice president of growth at The Junkluggers, agreed that e-waste is one of the fastest growing waste streams in the U.S. and internationally, however less than 20 percent of e-waste is formally recycled.

“This data is alarming. The rapid expansion of technology, not to mention an increasingly consumption-driven society, results in the creation of a very large and growing amount of electronic waste or e-waste,” Ferguson said. Electronic waste accounts for two percent of the municipal waste stream but contributes more than seventy percent of the toxins.

According to Stacy Savage, founder & chief executive officer at Zero Waste Strategies, in 2019 alone, over six million tons of e-waste were generated, a 21 percent increase from just 5 years prior according to EPA estimates. Yet only 15 to 20 percent of this is properly recycled, with the rest finding its way into landfills



Consumer awareness of the environmental impact of e-waste is increasing.

or illegal export channels.

“Solving America’s e-waste crisis requires a multi-pronged approach that addresses excessive consumption, recycling barriers, infrastructure gaps and technological limitations,” Savage said. “And while some efforts have been made to restrict e-waste exports through voluntary industry initiatives and legislation like the Responsible Electronics Recycling Act, significant amounts of America’s e-waste continues to be exported abroad for recycling and disposal. This is often done through illegal channels to countries with less stringent environmental regulations and labor standards. More stringent oversight and domestic recycling infrastructure improvements are still needed to ethically and safely manage the e-waste generated in the U.S.”

The good news is that consumer awareness is on the rise, namely the environmental impact of e-waste is increasing among consumers bringing more attention to this area. More individuals and organizations are promoting responsible e-waste disposal and recycling practices.

“Many factors are contributing to the growth of e-waste and rapid technolog-

ical advancements is one of the largest factors. The consumer electronics industry continually releases new and updated products with enhanced features and capabilities,” Bilbruck said. “This drives consumers to replace their existing devices more frequently, leading to increased e-waste. Shorter product lifespans and life cycles of these products means that electronics are designed with shorter lifespans due to rapid technological obsolescence and built-in obsolescence, encouraging consumers to upgrade to newer models sooner.”

Ferguson said the U.S. government’s stricter stance on exporting e-waste to third-world countries signifies a commitment to a new level of sustainable e-waste management practices domestically.

“E-waste recycling laws vary by state with around 25 states having laws related to recycling. Some legislation focuses on older/larger electronics; however, we must also address smaller technology such as phones, tablets and laptops,” Ferguson said.

At The Junkluggers, they partner with municipalities, local businesses, and local charities to collect e-waste for free so

it can be discarded properly and kept out of landfills.

“We are starting to see designated e-waste drop off sections at some landfills,” Ferguson said. “Overall, it is important to educate consumers about e-waste by reinforcing what it is, what should be recycled and how to do it.”

Heather Walch, chief executive officer of Repowered, one of the largest collectors of e-waste in Minnesota, said in that state, a recent study showed that an estimated 266 million pounds of electronic waste could be recycled, but only about 24 percent actually make it to a recycler. Companies and individuals are either stockpiling in storage closets and basements or, putting these items in the trash.

“The pandemic had a significant impact on the e-waste sector: increase in remote work (and now long-term hybrid work environments), permanent closure of some offices, 1:1 strategies of iPads and Chromebooks in schools, and so on,” Walch said. “These changes occurred in schools and businesses and even in homes, where each person now has multiple devices.”

See MOUNTING E-WASTE, Page B6

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Ohio EPA awards \$3.2 million in grants for electric vehicle & equipment upgrades



The Ohio EPA is awarding more than \$3.2 million to seven organizations to replace aging diesel-powered vehicles and equipment with new electric vehicles and equipment.

Ohio EPA estimates that these upgrades will greatly reduce annual emissions across Ohio, including those pollutants that create smog.

“Every little bit helps when it comes to improving air quality,” said Ohio EPA director Anne M. Vogel. “It’s exciting to know that these grants fund projects that will reduce the amount of pollutants

released into the air. This is just one of many things the DeWine administration is doing to improve air quality throughout the state as we transition to modern, cleaner technologies for both transportation and industry.”

Grant recipients are:

- Dutch Maid Logistics, Inc., Cuyahoga and Portage counties, is receiving \$764,865 to help replace three 2006-2007 model year terminal tractors with new all-electric terminal tractors.

- Exel Inc. dba DHL Supply Chain (USA), Lucas County, is receiving \$309,000 to help replace two 2015 and 2019 model year diesel terminal tractors with new all-electric terminal tractors.

- KWA Inc. Ltd., Trumbull County, is receiving \$217,661 to help replace a 2017 diesel terminal tractor with one new all-electric terminal tractor.

- City of Mentor, Lake County, \$329,000 to help replace two 1996 and 2005 diesel school buses with one new all-electric school bus.

- Metalico Akron Inc., Summit County, is receiving \$754,188 to help replace a 2005 diesel material handler with one new all-electric material handler.

- Ruan Transport Corporation, Cuyahoga County, is receiving \$292,165 to help replace one 2007 diesel terminal tractor with one new all-electric terminal tractor.

- Shaker Heights City Schools, Cuyahoga County, is receiving \$596,144 to help replace two 2010 model year diesel school buses with new all-electric school buses.

The grants are funded from dollars allocated to Ohio from the settlement of an enforcement action taken against

Volkswagen and its affiliated companies by U.S. EPA and the state of California for violations under the Clean Air Act. During his time as Attorney General, Governor DeWine, along with other state attorneys general, worked to ensure that states would receive their share of funding from the settlement. The grant program is investing \$75 million over 10 years to reduce nitrogen oxide pollution in Ohio. Selection considerations were given for specifically targeted reduction categories (e.g., school and transit buses, and heavy-duty trucks) and to vehicle replacement projects that would produce the largest reduction of nitrogen oxide emissions for the grant dollars invested.

A committee of Ohio EPA and Ohio Department of Transportation representatives reviewed the grant applications and selected the grant recipients.

E-waste recycling market to hit \$7.3 billion by 2031

According to Transparency Market Research Inc., the global e-scrap recycling market is projected to flourish at a CAGR of 7.6 percent from 2021 to 2031. As per a report published by TMR, a valuation of \$7.3 billion is anticipated for the market in 2031. As of 2023, the market for e-scrap recycling is expected to close at \$ 4.1 billion.

Increasing consumer awareness about the environmental impact of electronic waste encourages responsible recycling practices, increasing the volume of electronics sent for recycling.

The growing global demand for electronic devices, including smartphones, laptops, tablets, and consumer electronics, leads to higher e-scrap generation, and the growing need to manage this waste appropriately, propels the growth of the market.

The global e-scrap recycling market is projected to grow at a significant pace during the forecast period, owing to the presence of institutions dealing with environmental issues, including e-scrap management, and the availability of large e-scrap volumes across the globe.

Key Takeaways from the Market Study

- As of 2022, the e-scrap recycling market was valued at \$3.8 billion.
- Based on product type, the large white goods segment is anticipated to dominate the industry during the forecast period. The increase in demand for refrigerators and freezers, washing machines, dishwashers, and many other consumer electronic goods has resulted in a rise in the recycling of large goods.
- Based on processed material, the metal segment dominates the market and is further anticipated to grow during the forecast period.



E-scrap Recycling Market: Key Trends and Opportunistic Frontiers

- Innovations in recycling technologies, including automated sorting, shredding, and material recovery processes, have made e-scrap recycling more efficient and cost-effective.
- Growing environmental awareness and concern about the impact of electronic waste on landfills, water, and air quality drive the demand for e-scrap recycling.

E-scrap Recycling Market- Regional Analysis

- Europe is expected to dominate the global e-scrap recycling industry during the forecast period. Amendment of stringent regulations regarding the e-scrap recycling process and a strong focus on recycling and sustainability, leading to a well-developed e-scrap recycling market. The EU’s WEEE (Waste Electrical and Electronic Equipment) Directive mandates responsible disposal and recycling of electronic waste.
- North America is anticipated to hold the largest E-scrap recycling market share during the forecast period owing to the strong presence of a well-established E-scrap recycling industry due to high levels of electronic device consumption. The United States, in particular, has a mature e-scrap recycling ecosystem.

California adopts nation’s strongest electronics repair law

California Governor Gavin Newsom signed the nation’s most sweeping electronics device repair legislation, SB 244, into law. Under the bill, manufacturers will be required to facilitate the repair of covered consumer electronics – including computers – by making certain tools and parts available to consumers and repair shops for at least seven years after production. The bill was supported by Apple and HP, yet opposed by device manufacturer trade associations, including the Consumer Technology Association.

In 2023 alone, 30 states introduced right-to-repair legislation for consumer electronics, farm equipment, or other products. California is now the third state with a consumer electronics repair law, following Minnesota and New York, and all three repair laws will be effective by 2024. A fourth law, specific to tractor repair, was also signed into law in Colorado earlier this year.

Right-to-repair laws represent a growing regulatory and reputational risk to companies with a large electronic waste

footprint, especially consumer electronic manufacturers.

In 2021, As You Sow filed a resolution with Microsoft urging action on the growing right-to-repair movement, later withdrawn after the company agreed to publish a plan to initiate new repair mechanisms for consumers. Following the agreement, Microsoft published a report in 2022 and has taken new actions to improve repairability, including Xbox consoles.

“California is the home of technological innovation and the nation’s most populous state. With the passage of a consumer electronics device repair law here, right-to-repair laws are poised to gain momentum in other states,” said Kelly McBee, circular economy senior coordinator at As You Sow. “Device manufacturers must mitigate regulatory and reputational risk by expediting product redesign for longevity and repairability, providing parts, tools, and repair instructions in all markets, and extending support for current and future device repair legislation, just as Apple has done in California.”

TDEC lands solar-powered EV chargers

The Tennessee Department of Environment and Conservation (TDEC) announced two solar-powered, non-grid-tied electric vehicle (EV) charging stations are now available for EV drivers to utilize free-of-charge at Pogue Creek Canyon’s Astronomy Field and the Window Cliffs State Natural Area trailhead.

The EV chargers, donated to TDEC by the Tennessee Valley Authority (TVA), will provide visitors to the State Natural Areas in Fentress and Putnam counties the ability to charge an EV in locations where the existing electric power grid could not support standard chargers. As part of the donation, TVA has also obtained and provided a prepaid maintenance plan for the chargers, minimizing state maintenance obligations for the equipment.

The effort supports the cooperative framework TDEC and TVA established under a 2021 Memorandum of Agreement to promote the development of a statewide EV charging network, the Fast Charge TN Network, that is part of TVA’s broader, multi-state Fast Charge Network. The solar-assisted chargers at two State Natural Area locations will also supplement the network of Level 2 charging stations being installed at all viable Tennessee State Parks as part of a partnership between TDEC and automotive manufacturer Rivian.

“A clean environment will continue to be necessary for future economic success and quality of life in Tennessee, and our ongoing commitment to EV infrastructure is an important part of this equation,” said TDEC commissioner David Salyers.

Apple will use 100 percent recycled cobalt by 2025

Apple announced a major acceleration of its work to expand recycled materials across its products, including a new 2025 target to use 100 percent recycled cobalt in all Apple-designed batteries. Additionally, by 2025, magnets in Apple devices will use entirely recycled rare earth elements, and all Apple-designed printed circuit boards will use 100 percent recycled tin soldering and 100 percent recycled gold plating.

In 2022, the company significantly expanded its use of key recycled metals, and now sources over two-thirds of all aluminum, nearly three-quarters of all rare earths, and more than 95 percent of all tungsten in Apple products from 100 percent recycled material. This rapid progress brings Apple closer to its aim to one day make all products with only recycled and renewable materials, and advances the company's 2030 goal to make every product carbon neutral.

"Every day, Apple is innovating to make technology that enriches people's lives, while protecting the planet we all share," said Tim Cook, Apple's chief executive officer. "From the recycled materials in our products, to the clean energy that powers our operations, our environmental work is integral to everything we make and to who we are. So we'll keep pressing forward in the belief that great technology should be great for our users, and for the environment."

"Our ambition to one day use 100 percent recycled and renewable materials in our products works hand in hand with Apple 2030: our goal to achieve carbon neutral products by 2030," said Lisa Jackson, Apple's vice president of

Environment, Policy, and Social Initiatives. "We're working toward both goals with urgency and advancing innovation across our entire industry in the process.

Apple has significantly expanded the use of 100 percent certified recycled cobalt over the past three years, making it possible to include in all Apple-designed batteries by 2025. In 2022, a quarter of all cobalt found in Apple products came from recycled material, up from 13 percent the previous year. Cobalt is a critical material in the batteries used in most consumer electronics, including Apple devices, enabling high energy density while also meeting Apple's robust standards for longevity and safety. Apple-designed batteries found in iPhone, iPad, Apple Watch, MacBook, and many other products represent a significant majority of the company's use of cobalt.

The company's use of 100 percent certified recycled rare earth elements has greatly expanded in the last year as well, going from 45 percent in 2021 to 73 percent in 2022. Since first introducing re-

cycled rare earths in the Taptic Engine of iPhone 11, Apple has expanded its use of the material across its devices, including in all magnets found in the latest iPhone, iPad, Apple Watch, MacBook, and Mac models. As magnets are by far Apple's largest use of rare earths, the new 2025 target means nearly all rare earths in Apple products will soon be 100 percent recycled.

As part of the accelerated new timeline, all Apple-designed printed circuit boards will use 100 percent certified recycled gold plating by 2025. This includes rigid boards, such as the main logic board, and flexible boards, like those connecting to the cameras or buttons in iPhone. Since pioneering an exclusively recycled supply chain for gold in the plating of the main logic board for iPhone 13, Apple has extended the material's use in additional components and products, including the wire of all cameras in the iPhone 14 lineup, and printed circuit boards of iPad, Apple Watch, AirPods Pro, MacBook Pro, Mac mini, and HomePod. Ap-

ple is also working to encourage broader adoption of recycled gold for non-custom components across the electronics industry.

By 2025, the company will use 100 percent certified recycled tin soldering on all Apple-designed printed rigid and flexible circuit boards. In recent years, Apple's use of recycled tin has expanded to the solder of many flexible printed circuit boards across Apple products, with 38 percent of all tin used last year coming from recycled sources. The application of recycled tin across even more components is underway, and the company is engaging more suppliers in this effort.

Innovation has also driven progress toward another of Apple's 2025 commitments: to eliminate plastics from the company's packaging. The development of fiber alternatives for packaging components like screen films, wraps, and foam cushioning has kept Apple on track toward this ambitious goal. To address the remaining 4 percent plastic in the company's packaging footprint, Apple is innovating to replace labels, lamination, and other small uses. In the last year, Apple developed a custom printer to introduce digital printing directly onto the boxes of iPhone 14 and iPhone 14 Pro, eliminating the need for most labels. And a new overprint varnish found in iPad Air, iPad Pro, and Apple Watch Series 8 packaging replaces the polypropylene plastic lamination found on boxes and packaging components. The innovation helped avoid over 1,100 metric tons of plastic and over 2,400 metric tons of carbon dioxide.



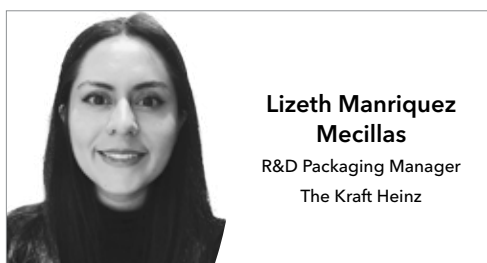
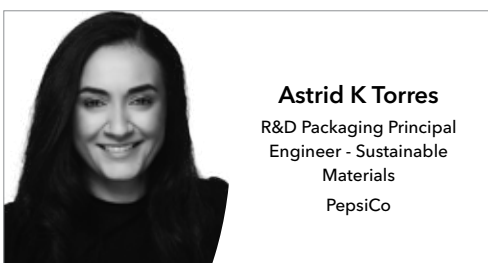
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EQUIPMENT SPOTLIGHT

Primary Reduction

Securing discarded electronic products can be a serious task. Primary reduction of e-scrap is important not only because of the valuable elements that must be recovered, but because all secure data elements must be destroyed as well. Statista recently reported that global e-waste represents roughly \$60 billion worth of raw materials such as gold, palladium, silver and copper. Only 17 percent of global e-waste, however, is documented as collected and properly recycled annually. To help increase that percentage, the following companies offer a variety of machines that can be used in e-scrap processing.

“A client recently purchased four of our Franklin Miller TASKMASTER® Shredders to improve vital stages of their shredding process,” explained Bill Galanty, president. This client processes the smallest electronic components, such as flash cards and circuit boards, to large components such as mainframe computers. The shredding end goal was to extract components such as silver, gold, and copper. To extract those precious metals, the e-waste feed required a multi-stage, size reduction sequence to achieve the required output size. Our team installed two, dual-stage, size reduction lines running simultaneously, using the Franklin Miller TASKMASTER TM3000 and a dual TASKMASTER TM1600 in each line.

“The shredders were the perfect solution for the tough, cutter alloy required and the processing demands involved. E-waste first flowed through the larger, TM3000 with fine, multi-tooth cutters

– the first step in the shredding process. The TM3000 reduces high volumes of solids with a low speed, high torque and dual shaft design. This shredder is beneficial in applications that demand high power, large throat openings and extra heavy-duty construction. The unit design provides effective operation with low noise, sparking, dust or heat rise. It can also rip, tear and shred through a variety of tough solids and reduce volume for further processing or economical disposal,” stated Galanty.

In the next processing stage, material flowed through a dual stage Franklin Miller TASKMASTER TM1600. These machines employed fine cutters to achieve the final output size required. Although smaller, the TM1600 is a powerful workhorse that shreds heavy solids in both gravity and liquid systems. Once the Franklin Miller shredders had finely reduced the e-waste, the material was ready for final processing. For over 100 years and three generations, Franklin Miller



Franklin Miller Inc.

has manufactured crushers, shredders, grinders, wastewater treatment systems and more, for the recycling, chemical, pharmaceutical, food, mineral and wastewater processing markets.

“Processing electronic scrap presents special challenges because when destroyed, the material must ultimately be devoid of all user specific data. Also, not all products require the same degree of destruction, but all electronic waste offers some level of recyclable materials,” commented Greg Wright, vice president of Granutech-Saturn Systems. “As a result, separation and recovery are critical elements of the overall process and Granutech-Saturn shredders provide the precision required for the destruction of all data storage products. Fully integrated separators perform efficient sorting and reclamation of e-scrap, regardless of the type involved. Our machines are designed to produce the final reduction piece size required while seamlessly integrating material separation and ultimately, the maximum volume of recyclable product. Granutech-Saturn e-scrap shredders provide the low to mid-range speed and high torque needed for high volume processing – up to 100 tons per hour – and with a wide array of additional processing requirement options. We also offer grinders that can be useful as part of a multi-stage system. Primary shredders for commercial e-scrap processing include our Saturn single, dual or quad-shaft machines and the multi-stage Saturn Grizzly M80 shredder.



Recycling Equipment Inc.

See PRIMARY REDUCTION, Page B5

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Continued on Page B5

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Primary Reduction

■Continued from Page B4

Integrated systems also provide the primary and secondary separation and size reduction needed for end product sale or disposal,” Wright added.

Cutter options are available depending on the size, shape, quantity and material involved, and more in-depth custom shredding solutions for high-security applications. Other options: custom blades, drives from 50 to 1250 hp, screens or magnets that may be needed for separation, post-shredding, grinders and granulators as needed and ancillary items such as infeed and discharge conveyors and vibration or rotary screen classifiers. The staff at Granutech-Saturn is proud to offer over 50 years of experience in manufacturing size reduction equipment for the recycling industry and they’re happy to help clients with their e-scrap processing needs.

Drew Ramsey, Southeast sales manager at Recycling Equipment (REI), stated, “We specialize in designing, manufacturing, and distributing a wide range of recycling equipment for various industries and applications. Whether its electronics, paper, plastic, wood, metal or other recyclable materials, REI delivers innovative machinery to efficiently process and prepare them for reuse or further recycling.”

Ramsey continued, “Many times, it can be challenging to find a turn-key solution to your equipment needs; this is where REI stands out. Testing customer materials is essential to sizing and designing the correct equipment. Equipped with a dual shaft, single shaft, and guillotine roll shear in our test lab, you can have confidence in your system design. REI heavy duty, low speed, high torque shredders stand up to the most demanding applications and our DS series operates at a slow speed with minimum noise, dust, and energy requirements. Our product line includes roll shears, shredders, balers, air systems, conveyors, tippers and more, which can help streamline the recycling process.

“REI team members take pride in our commitment to customer satisfaction and we offer comprehensive support services, including installation, maintenance, and training. Our team of experts collaborate closely with clients



Granutech-Saturn Systems

to understand their specific recycling needs and provide tailored solutions that maximize productivity, minimize waste, and contribute to a greener future. We’ve made a strong commitment to sustainability and environmental stewardship. By partnering with REI, businesses and organizations can optimize their recycling operations, improve resource efficiency, and reduce their environmental impact. With our reliable and cutting-edge equipment, we are paving the way for a circular economy, where materials are reused and recycled, fostering a more sustainable and eco-friendlier world.”



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For over 100 years, Franklin Miller has been a leader in providing size reduction technology via the equipment the company manufactures: crushers, shredders, grinders, wastewater treatment systems and more. The firm’s broad line of processors includes units for recycling, chemical processing, pharmaceuticals, foodstuffs, minerals, wastewater treatment and many other industries.



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Mounting E-waste

Continued from Page B1

E-waste recycling has always been a low-margin business model, but Walch said the model has felt increasingly difficult this past year as the value of refurbished laptops plummeted.

“At the same time that the economics of this work are immensely challenging, we see increased usage of lithium batteries in small gadgets, which can cause ‘thermal events’ in recycling facilities,” Walch said. “Consumers also expect to be able to recycle for free, despite it being very expensive to responsibly recycle electronics and guarantee data security.”

Innovative Approaches To E-Waste

Bilbruck said lifecycle management of these products and devices will be the norm as companies and manufacturers are put in a more responsible role of what happens with these products through new regulations and laws.

“Also there is a push to reclaim rare earth materials that are used in building many of these devices because of the global scarcity of these materials and the high demand they have in today’s market,” Bilbruck said.

“In my opinion it is a huge opportunity for us to recycle and reuse these materials here in the U.S.,” Bilbruck said. “This could result in new and innovative business models that keep the recycling and manufacturing of these devices on U.S. soil and thus help forge a whole new industry for the U.S. marketplace. It also puts more control in our hands for the supply chain of these devices and the materials that are used in the manufacturing of these devices. Chain of custody and lifecycle management is a huge opportunity for companies and recyclers.”

Initially the e-waste challenge was focused on keeping toxins out of landfills and that remains critical. However, as Ferguson said, today the precious metals required to create electronic devices are also being depleted.

“It is imperative that we properly recycle e-waste so we can reuse the materials and keep them out of landfills,” Ferguson said. “The recycling industry will play a key role in helping us do this successfully. There is a great opportunity for the recycling industry to educate manufacturers, businesses, and consumers on how to dispose of electronics properly and to get everyone involved. Players in the industry will need to continue to come up with creative solutions to make e-waste recycling easier.”

At the collection point, Repowered is focused on processes to make recycling easier and more convenient.

“We believe the opportunity for innovation is greater downstream – there is still a lot of work to get metals ready for manufacturers, which is ripe for disruption and innovation,” Walch said.

E-waste tracking has improved in recent years, Savage said there is still room for expansion. Currently, 25 states and the District of Columbia have enacted statewide “takeback” e-waste laws.

“Some of these laws are focused on producer ‘take-back’ programs to release local governments and taxpayers of the financial burden of managing toxic e-waste,” Savage said. “The EPA has an online tracking system called the Na-



tional Environmental Information Exchange Network that monitors e-waste movement across participating states. More manufacturers and recyclers are also adopting blockchain and RFID tags to better track devices end-to-end. However, in states without comprehensive laws, significant e-waste still escapes proper tracking and monitoring.”

Emerging technologies like AI-based sorting systems, advanced robotics, and green chemistry solutions are beginning to improve e-waste recycling efficiency. But Savage said technology alone cannot address the root drivers.

“Designing devices for repair, refurbishment, and material recovery is critical to slowing resource consumption,” Savage said. “Producer take-back programs could alleviate cost and logistic barriers to recycling. Additional frameworks for voluntary and legislated options warrant consideration.”

Ownership Shift

Looking ahead, Bilbruck said e-waste recycling will be a managed service that is bundled from the manufacturer at the creation of the product in the future. It will be priced into the total price when you buy the product and third parties, like Captjur, will conduct these programs for large manufacturers. Manufacturers must make sure these products are being recycled properly and that we are reclaiming as much of the materials as possible. In addition, there will be total tracking of these devices within these programs.

“With AI technology-enabled platforms to do this and block chain (chain of command) technology, we will know where every device is and the life cycle point where it stands,” Bilbruck said. “This holds great upside revenue potential not only for manufacturers, but for a new waste management and recycling vertical for waste management companies.”

Fundamentally, Savage stressed that addressing America’s e-waste challenge requires transitioning to a circular economic model. She said this entails reducing consumption, designing for recyclability, extending product lifecycles, improving collection infrastructure, adopting smarter recycling technologies, and stronger oversight and tracking.

“Collaborative efforts between domestic and foreign policymakers, manufacturers, recyclers, and consumers are essential to bring about this systemic shift,” Savage said. “With electronics waste one of the world’s fastest growing and most toxic waste streams, the environmental stakes could not be higher.”

Recycling companies convicted for illegally processing 800 tons of hazardous e-waste

New York State Department of Environmental Conservation (DEC) Commissioner Basil Seggos and Attorney General Letitia James announced the convictions of ALPCO Recycling, Inc., (ALPCO), and its owner, Alton Plumb, Jr., as well as Finger Lakes Cleanup and Recycling Consultants, Inc., and its project manager, Craig Foster, for their roles in illegally processing and disposing of 800 tons of electronic waste (e-waste) in Wayne County. The convictions are the result of a joint investigation by DEC, the Office of the Attorney General (OAG), and the U.S. Environmental Protection Agency (EPA).

“Dumping e-waste is illegal and has the potential to damage our natural resources and impact the health of New Yorkers long after the dumping occurs,” said Commissioner Seggos. “DEC’s thorough investigation and the joint enforcement action with Attorney General James and the U.S. EPA resulted in these convictions of two recycling companies and sends a strong message that New York State is not a dumping ground for illegal waste disposal and violators will be brought to justice.”

In 2015, a large amount of e-waste was abandoned at the Geneva Enterprise Development Center (GEDC) in Seneca County. The abandoned waste included television and computer monitors with Cathode Ray Tubes, which are hazardous and contain lead. In 2016, when Finger Lakes Cleanup and Recycling Consultants was hired to clean up the abandoned e-waste, Foster approached ALPCO owner Plumb, Jr. for assistance. Despite knowing that ALPCO did not have a permit and was not authorized to process hazardous waste, Foster, on behalf of his company, entered into an agreement with Plumb to process and dispose of the abandoned e-waste. Altogether, ALPCO unlawfully processed and disposed of 800 tons of e-waste from May 2016 to July 2016.

Under New York Environmental Conservation Law, e-waste must be properly disposed of through the appropriate waste or recycling system. By law, a DEC solid waste facility registration must be completed and approved by DEC in order for an entity to lawfully process e-waste in New York State. Recently adopted regulations require electronic waste recycling facilities to submit closure plans and closure cost estimates that must be updated annually. The owner or operator of the electronic waste recycling facility must provide proof of financial assurance to DEC within 180 days of the registration approval. These regulations are in place to protect New York residents and the environment from improperly disposed of hazardous materials and e-waste.

Both Foster and Finger Lakes Cleanup and Recycling Consultants, pleaded guilty in Wayne County Court before the Hon. Richard M. Hea. Foster pleaded guilty to Unauthorized Possession, Disposal and Dealing in Hazardous Wastes (Class A misdemeanor) and was sentenced to a one year conditional discharge. Finger Lakes Cleanup and Recycling Consultants pleaded guilty to Unlawful Dealing in Hazardous Wastes in the First Degree (Class E felony) and was sentenced to a three year conditional discharge. Additionally, they were both fined \$5,000 each.

Plumb and his company, ALPCO, previously pleaded guilty in Wayne County Court to violating the state’s Environmental Conservation Law and was sentenced to a one year conditional discharge, and paid a \$1,500 fine. ALPCO pleaded guilty to Unauthorized Possession, Disposal, and Dealing in Hazardous Wastes (Class A misdemeanor) and was sentenced to an unconditional discharge. Plumb also previously agreed to a DEC consent order, requiring him to pay \$225,000 in civil penalties for Environmental Conservation Law and Permit violations.

TDEC lands solar-powered EV chargers

The Tennessee Department of Environment and Conservation (TDEC) announced two solar-powered, non-grid-tied electric vehicle (EV) charging stations are now available for EV drivers to utilize free-of-charge at Pogue Creek Canyon’s Astronomy Field and the Window Cliffs State Natural Area trailhead.

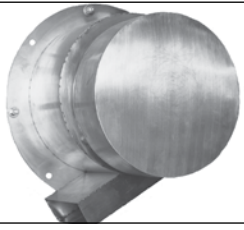
The EV chargers, donated to TDEC by the Tennessee Valley Authority (TVA), will provide visitors to the State Natural Areas in Fentress and Putnam counties the ability to charge an EV in locations where the existing electric power grid could not support standard chargers. As part of the donation, TVA has also obtained and provided a prepaid maintenance plan for the chargers, minimizing state maintenance obligations for the equipment.

The effort supports the cooperative

framework TDEC and TVA established under a 2021 Memorandum of Agreement to promote the development of a statewide EV charging network, the Fast Charge TN Network, that is part of TVA’s broader, multi-state Fast Charge Network. The solar-assisted chargers at two State Natural Area locations will also supplement the network of Level 2 charging stations being installed at all viable Tennessee State Parks as part of a partnership between TDEC and automotive manufacturer Rivian.

“A clean environment will continue to be necessary for future economic success and quality of life in Tennessee, and our ongoing commitment to EV infrastructure is an important part of this equation,” said TDEC commissioner David Salyers. “The stations will provide added value to our natural area visitors while keeping our air clean and our economy thriving.”

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Ascend Elements, SK ecoplant to build battery recycling facility in Kentucky

Kentucky Gov. Andy Beshear highlighted another investment in Kentucky's rapidly growing electric vehicle (EV) sector, as Ascend Elements and SK ecoplant have announced plans to locate a \$65.8 million lithium-ion battery recycling facility in Christian County that will create 60 full time jobs.

The project to locate a 100,000 sq.ft. facility comes as part of a joint venture between Ascend Elements, SK ecoplant and its subsidiary, TES. Construction is expected to begin in November with completion scheduled for January 2025. The operation will annually produce around 12,000 metric tons of black mass. The black mass produced at the Hopkinsville facility will help supply Ascend Elements' nearby Apex 1 engineered battery materials facility, an approximately \$1 billion project announced in 2022 that is currently under construction. Apex 1 is on schedule to begin operation in 2024 and will be North America's first sustainable cathode precursor (pCAM) and cathode active material (CAM) manufacturing facility. At full capacity, the Apex 1 project

will produce enough pCAM for approximately 750,000 new EVs each year.

"With this joint venture, we are deepening our relationship with SK ecoplant and reaffirming our commitment to Southwestern Kentucky," said Michael O'Kronley, chief executive officer of Ascend Elements. "The EV battery materials industry will continue to grow in the United States, and Kentucky is at the center of it all. I'd like to thank Gov. Beshear and his staff for their partnership as we work to accelerate the global transition to clean energy and bring good jobs to the community."

Serving as the key player of SK Group's green business, South Korea-based SK ecoplant changed its name from SK Engineering and Construction in May 2021 and expanded into an environmental energy solutions business. The company has undertaken more than 100 projects in various international locations. Its affiliated company, TES, is a global organization specializing in sustainable technology lifecycle services and e-waste recycling in Singapore, which operates 46 treatment facilities in 23 countries.

Volvo Cars and Northvolt break ground on Gothenburg gigafactory

Construction of Volvo Cars and Northvolt's joint Li-on battery gigafactory in Gothenburg, Sweden, is underway. Once complete, it will be among the largest in Europe, with over 3,000 employees and potential to produce batteries for around half a million cars per year.

During the summer, Novo Energy, the joint company, had its environmental permit for the new plant approved. In August, the City Planning Committee in Gothenburg also approved the building permit for the first phase. The building will include the first production line, which is expected to be operational in late 2026.

Novo Energy's R&D activities at Lindholmen are expanding at a fast pace. There, specialists and engineers are developing tomorrow's batteries for Volvo and Polestar cars.

When complete, the new battery gigafactory in Gothenburg will have a potential annual cell production capacity of up to 50 gigawatt hours (GWh).

Purified wastewater will be used to cool the plant, which is unique at this scale. Two large pipes, one meter in diameter, are currently being laid to transport the water from the region's wastewater plant to the gigafactory, and opposite, a

distance of six kilometres.

Göteborg Energi and Vattenfall are building a power station north of the site for connecting the gigafactory to the regional grid's 130 kV power line. Preparatory work is also underway, among other things, to connect the site to the district heating, water, stormwater and wastewater systems.

Building the gigafactory will involve a large number of construction jobs, as well as increased traffic. Work is underway to facilitate the building process and reduce the impact on people working in the area and society at large. This involves temporary housing for construction workers and solutions for handling increased traffic volumes to the area in Torslanda.

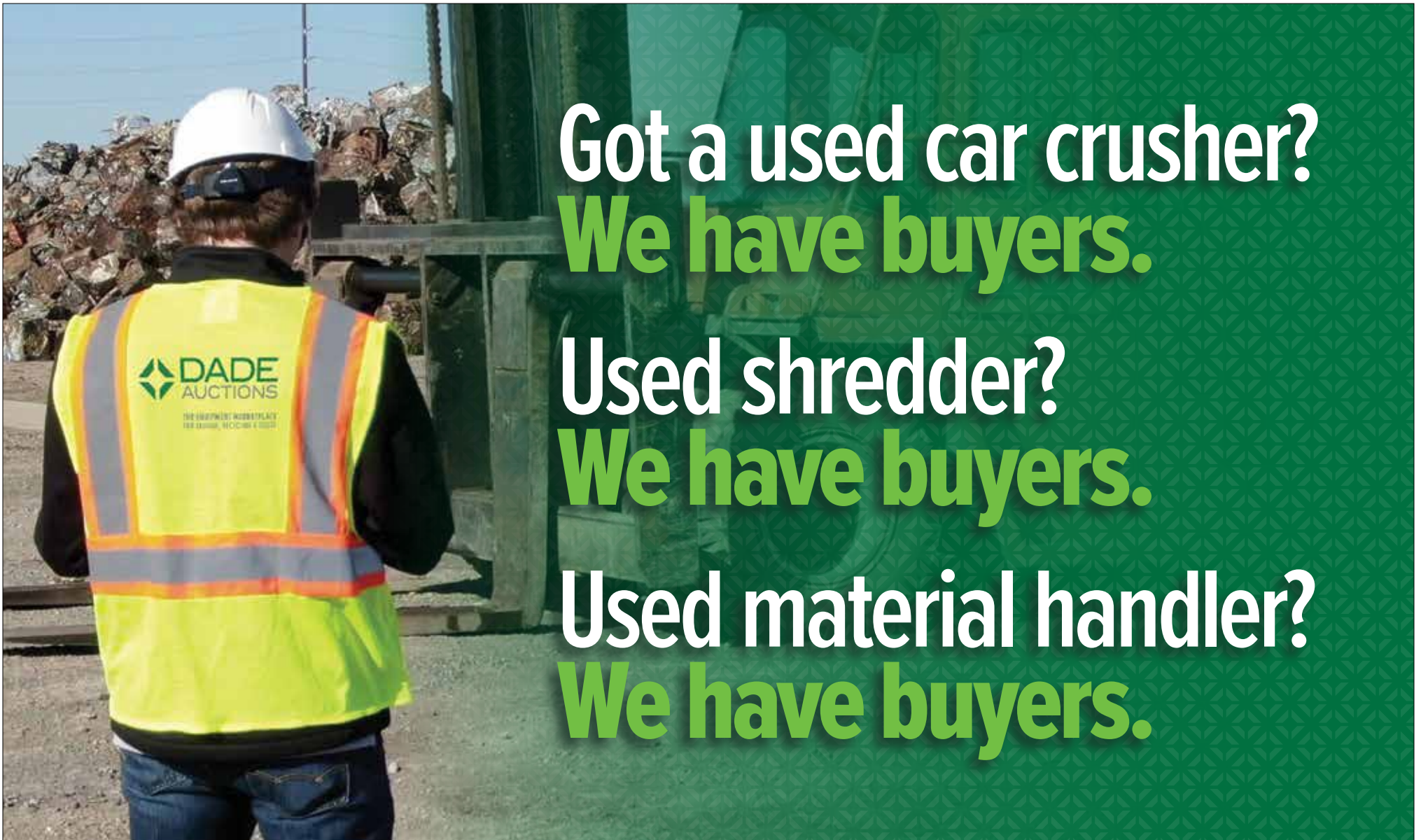
The City of Gothenburg has decided to establish a training center for electromobility and battery manufacturing at Lindholmen. There, employees, as well as high school students, adult students and students at vocational colleges will be able to be trained in modern learning environments. The City of Gothenburg and Region Västra Götaland are each investing SEK 45 million (approx. EUR 4 million) in the training center, which is expected to open in autumn 2024.



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