

SEPTEMBER 2024 VOLUME 15, NUMBER 9
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MAGAZINE

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FROM THE EDITOR

THE LEAVES ARE GETTING READY TO CHANGE AND AS WE MOVE INTO THE FALL AND schools are back in session, waste and recycling materials collected start shifting. The summer variety is out and school waste is in. This may mean a different strategy or focus that you stepped back from during the summer. What are some of the ways collection may change in your area and how do you deal with any challenges? It is great to get feedback about some of the programs across the U.S. and even internationally. We all learn from what each other on handling waste, whether it is implementing newly developed programs or reaching out to communities explaining how they can help make the waste process more efficient by “recycling right”. Let us know what is going on in your cities and towns. We always appreciate hearing from you.

We have a great issue for you this month. “Best Practices for Developing a Successful Tire Program” discusses how the advancement of tire and digital technology will continue to evolve the commercial industry, and “Choosing Design Elements for a Versatile, Long-Lasting Structure” says that choosing building materials manufactured with quality and designed for a multitude of uses in tough conditions, will ensure a long-lasting, versatile structure, while “Using Telematics Integrations to Eliminate Fuel Fraud in the Waste Industry” makes the case for leveraging advanced solutions such as telematics and fuel cards to maintain a competitive advantage. And don’t miss “Extended Producer Responsibility: Getting to Effectiveness”, which talks about establishing effectiveness goals that are rational and achievable for EPR program collection, and “Advantages of Air Technology Solutions in Waste Management” that explains how air technology is a versatile and essential component of modern waste management strategies. Other great articles include a focus on organics recycling and economic opportunity, the importance of monitoring market rates and exploring opportunities like leveraging collective buying power, how sustainability is a key growth lever to help transform the environmental services sector, and more!

Be sure to visit Waste Advantage Magazine website every day for recent news and articles. In addition, our Supplier Directory spotlights companies that provide you with waste and recycling industry solutions. As a networking platform for buyer and seller, readers can review a company’s specialty, including the products and services offered through descriptions, images, videos and more. At the MarketPlace section, you can find out what’s new, view additional categories, featured listings, while our Videos page features live-action news, practices, product showings, etc. All great information when you are making important decisions.

Our web series, “Talking Trash” is a dedicated channel for the waste collection industry shining a light on what happens behind the scenes at waste collection companies. From tours of MRFs and landfills, walk-throughs of yards and truck fleets to informative interviews, Talking Trash at <https://wasteadvantagemag.com/talking-trash> gives you a closer look at what is happening today at leading waste companies. This great section is sponsored by WIS (Waste Innovative Solutions), specialists in waste management software and hardware solutions. Check out highlights on American Waste Control, Penn Waste (A Waste Connections company), Rumpke Waste & Recycling, and the newest one on Waste Pro. Keep on the lookout for more to come and let us know if you are interested sharing your story in the future.

Stay safe and healthy!

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Photo courtesy of Impact Air Systems.

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Casella Waste Systems, Inc. Expands its Footprint in The Mid-Atlantic with Two Acquisitions

Casella Waste Systems, Inc. announced that it has acquired two solid waste businesses with operations in the Mid-Atlantic, LMR Disposal LLC, which closed on July 1, and Whitetail Disposal, Inc., which closed on August 1. The acquisitions include collection operations across eastern Pennsylvania and western New Jersey, complementing the Company's existing operations in the Mid-Atlantic. The Company expects to generate more than \$100 million of total annualized revenues from the two acquisitions.

"We are very excited about the acquisitions of Whitetail and LMR as they represent continued execution against our disciplined growth strategy, further expanding our operations in the Mid-Atlantic where we are densifying and expanding operations," said John W. Casella, Chairman and CEO of Casella Waste Systems, Inc. "Both businesses fit nicely with our existing regional platform acquired last year and present us with additional growth opportunities."

"We are pleased to welcome the hardworking employees of Whitetail and LMR to our team, and we look forward to partnering with the prior owners to help ensure a smooth transition for our new customers and operations," Casella said. "It is clear the emphasis on people and community has helped support the success of these great businesses. We are committed to consistent and reliable service to our new customers, and we are eager to build upon this by introducing our differentiated resource solutions service offerings and capabilities to their respective customer bases."

For more information, visit www.casella.com.

Rumpke Opens North America's Largest Recycling Center

Rumpke Waste & Recycling has opened North America's largest and most technologically advanced recycling technology and company, state, industry, and community leaders gathered to celebrate at the new Rumpke Recycling & Resource Center in Columbus, OH. "The future of recycling is now. Our Rumpke Recycling & Resource Center ensures enough recycling capacity to serve the long-term needs as the region's commercial development continues and the population tops an estimated 3 million," said Andrew Rumpke, President at Rumpke. "Rumpke is the market leader, providing an essential component of our region's and country's circular economy. Given our mission to deliver exceptional waste and recycling solutions to our customers and communities through a commitment to safety, service the environment, and the growth of our people, we must always strategically plan well into the future to meet our customer's needs by investing, innovating and providing the best options for society's waste.

The facility, which processes material from 50 Ohio counties, fuels the local circular economy. More than 90 percent of the material processed at the Rumpke Recycling & Resource Center goes to end-users in Ohio. The new 226,000 square-foot facility increases processing capability from 160,000 tons of material a year to 250,000 tons. It increases material processing speed to a minimum of 60 tons per hour versus 30 tons per hour, and it increases the material recovery rate to 98 percent.

Rumpke also created a 3,000 square foot education center designed in collaboration with COSI (the Center of Science & Industry) to help the public learn about recycling. Groups of people ages 10 and up can visit Rumpke.com to schedule tours starting in October. The hands-on exhibit allows visitors to shop at a sustainable market, scan products to determine recyclability, enjoy interactive video games, play with an interactive model of the recycling facility, and see the products that recycling creates.

Rumpke designed the facility with the community in mind. The first floor features a career center for Rumpke's CDL, customer service, sales, leadership, and continuing education programs. The second floor features a Research and Development Center, where schools and universities can work with Rumpke to research and study better ways to recycle. Rumpke has already cooperated with Ohio State students and hopes to work with other local schools.

For more information, visit www.rumpke.com.

BVSWMA, Inc. Eliminates Tipping Fees For Cities of Bryan and College Station

The **Brazos Valley Solid Waste Management Agency, Inc.** (BVSWMA) eliminated tipping fees for the cities of Bryan and College Station. This means no city trucks nor residents will pay a fee to dump at Twin Oaks Landfill. The decision will save the cities a combined total of close to \$6 million every year. Response from city officials has been overwhelmingly positive.

"Waiving the tipping fees for local municipalities is a remarkable testament to BVSWMA's adept management and innovative approach. The revenue generated from the landfill's renewable natural gas production has led to substantial savings," City of College Station Mayor and BVSWMA Board Member, John Nichols, said. "Our residents highly value College Station's solid waste services, and these funds will further improve our operations."

City of Bryan Mayor and BVSWMA Board Chairman, Bobby Gutierrez agreed, noting that "collaborative efforts among BVSWMA, Bryan, and College Station are vital for our community's welfare. By eliminating the tipping fee, we can enhance our already superior solid waste services for our residents. We are deeply appreciative of the teamwork and shared vision that make such advancements possible."



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Not only will this decision save the cities millions of dollars, but it also makes Twin Oaks Landfill the first and only landfill in the nation to implement such a fee. “Since its opening in 2011, Twin Oaks Landfill has been working to lower city rates. It is an exciting and unique opportunity to be able to offer the Cities of Bryan and College Station the lowest landfill rate in the United States,” BVSWMA, Inc. Executive Director, Bryan Griesbach, said.

For more information, visit www.bvswma.com.

OC Waste & Recycling Earns National Achievement Award

OC Waste & Recycling (OCWR) has received the 2024 Achievement Award from the National Association of Counties (NACo) for its groundbreaking work in the Senate Bill 1383 Procurement Program & Market Development Plan. The honor acknowledges excellence in pioneering efforts to create markets for recovered organics and fostering collaboration with regional partners.

“Senate Bill 1383 set methane emissions reduction targets for California beginning in 2022, requiring jurisdictions to implement mandatory organic waste collection and reduce organic waste disposal from landfills,” said Tom Koutroulis, Director of OC Waste & Recycling. “OCWR created new procurement partnership opportunities with jurisdictions, businesses, and non-profits, and provided innovative habitat mitigation, all in support of SB 1383 procurement targets.”

OCWR’s comprehensive recycling initiative begins with the collection of green and organic waste from residential curbsides, which is then transformed into compost and mulch. These beneficial products are then distributed back to the community, serving as valuable resources to enhance gardens and landscaping, all free of charge.

Since the beginning of the community composting and mulch program in October 2020, OCWR’s greeneries (located at Bee Canyon and Capistrano, co-located at the County landfills) have successfully diverted more than 30,000 tons of green waste and manure from critical landfill space. OCWR has provided compost and/or mulch to 24 of the 35 cities in Orange County, partnering with a wildlife conservancy, a water district, and three County agencies for compost and mulch. In addition, in 2023, through the market development program, the department received 19,259 tons of feedstock from residential curbside green waste and horse manure for composting, resulting in the distribution of 4,975 tons of mulch and 2,560 tons of compost.

“We thank NACo for recognizing our efforts and for contributing to raising awareness about the comprehensive and sustainable services offered by our County,” continued Koutroulis. “United, we possess the ability to impact and shape a better future for us all.”

For more information, visit www.OCLandfills.com.

Henderson County Public Schools’ Composting Program for Food Scraps and Compostable Foodservice Packaging Enhanced

In 2019, the Henderson County Solid Waste Division launched a pilot composting program across six elementary schools within the Henderson County Public School District, involving nearly 2,800 students. Students actively participated in sorting their lunch waste into designated trash and compost bins. The program aimed to reduce the amount of food scraps that would be destined for the landfill, and instead divert those nutrient-rich food scraps for composting. In addition to food scraps, the county’s school composting program includes items like compostable paper trays, containers and napkins. The inclusion of these compostable items in the program assists in capturing more food scraps into the compost collection containers and further reduces quantities of landfilled packaging material.

To support this effort, Henderson County Solid Waste and Henderson County Schools partnered with the Foodservice Packaging Institute (FPI), the trade association for the foodservice packaging industry in North America, which plays an active role in the recovery of foodservice packaging items. FPI and Henderson County Schools are excited to share the success of the initiative, highlighting the significant strides made in waste diversion within the school community. “The pilot composting program diverted 38.27 tons in 2021 – 2022 and 47.64 tons in 2022 – 2023. However, some non-compostable items were mistakenly included, while compostable items like fiber trays and napkins were discarded,” explained Robert Rolfe, Henderson County Public Schools Director of Child Nutrition. “Partnering with FPI has helped us reinforce handling protocols for organics and packaging, streamlining an effective program for students and staff.”

To assist the schools in engaging their facilities staff, teachers, and students to adopt new habits, FPI provided Henderson County Schools with a communications grant that was used to provide crucial support throughout various stages of the program. Initially, the grant facilitated the creation of training materials for cafeteria and custodian staff. Back-of-house training and over-bin signage were implemented to ensure that those integral to the program understood the importance of proper waste sorting. As the program evolved, FPI’s communications grant expanded its support to engage students and teachers directly. This included the development of a Teacher Training Guide, over-bin signs in the cafeteria with kid-friendly messaging, and vibrant stickers for kids designed to inspire active participation in waste diversion. The stickers featured a “Super Sorter” superhero theme to inject an element of fun into the educational process. Some schools also plan to introduce creative elements, such as compost pledge walls and colorful trackers, showcasing the school’s progress towards their contamination reduction goal.

“We were excited to partner with Henderson County Solid Waste and Henderson County Public Schools in FPI’s first school com

posting partnership to boost their composting program,” said Natha Dempsey, president of the Foodservice Packaging Institute. “The school district’s success demonstrates that a well-designed composting program for food scraps and packaging can offer a significant opportunity to reduce materials going to landfills while educating students about the importance of waste diversion.”

For more information, visit HCRcycles.org.

Republic Services Polymer Center Honored as Industry’s 2023 Sustainability Game Changer

Republic Services, Inc. has been honored with the National Waste & Recycling Association’s (Nwra) 2023 Sustainability Game Changer Award for its Polymer Center, celebrating the facility’s innovative approach to plastics circularity. The Polymer Center in Las Vegas, NV is the first in a national network under development to enable greater circularity for rigid plastics and support sustainable packaging, helping customers achieve their sustainability goals. “Through the Polymer Center, we’re transforming the plastics value chain, from curbside collection to consumer packaging and back again,” said Pete Keller, Vice President of Recycling and Sustainability. “Our goal is to enable true bottle-to-bottle circularity and help consumer packaged goods companies meet their recycled content goals. We’re grateful to Nwra for recognizing the Polymer Center as 2023’s Sustainability Game Changer.”

Republic Services’ Polymer Center processes sorted and baled plastics from recycling facilities, further separating plastics by type and color to produce hot-washed recycled PET flake and color-sorted olefins. Republic also launched the Blue Polymers joint venture to further process olefins from Polymer Centers and create custom drop-in solutions for packaging manufacturers.

“Game changer means the narrative has shifted,” said Nwra President and CEO Michael E. Hoffman. “Republic Services Polymer Center’s strategy has changed the circular economy narrative and demonstrated market-based circular solutions are viable.”

For more information, visit RepublicServices.com.

CO₂ Recovery Technology Ramps Up in North America

Hitachi Zosen Inova North America (HZI), a global expert in providing integrated waste to energy solutions, has exclusively partnered with Hypro Engineers Pvt Ltd (Hypro), a proven CO₂ recovery and liquefaction technology supplier, to maximize CO₂ recovery opportunities from food and beverage manufacturing waste in the U.S..

HZI North America Managing Director Heath Jones said it is a really exciting time for renewable energy in the U.S., and the partnership with Hypro would enable HZI North America to ramp up its

capabilities in CO₂ recovery solutions. “Millions of tons of crops are used in food and beverage production every year, and these crops yield potentially valuable carbon, presenting an opportunity,” Jones said.

Director of Product Management Renewable Gas, HZI North America Dr. Benjamin Burfeind added that HZI and Hypro will leverage their respective industry expertise to recover carbon as part of maximizing the value of waste. “This will enable us to provide a readily available biogenic CO₂ that is refined to food and beverage grade, per the broadly accepted ISBT (International Society of Beverage Technologists) standard,” Dr Burfeind said.

“Hypro’s CO₂ recovery program is already in use by more than 40 beverage producers in 25+ countries, and this exclusive partnership with HZI North America represents a big opportunity for food and beverage manufacturers here,” he said.

Jones added that Hypro’s technology enhances HZI’s already extensive suite of integrated waste to energy solutions. “HZI is a highly experienced waste to energy company that has been around for over a hundred years. Our innovative and reliable solutions have been part of more than 1,600 reference projects worldwide.”

For more information, visit www.hz-inova.com/north-america.



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2024

September

9 – 11: Arkansas Recycling Coalition Conference & Tradeshow

Oaklawn Racing Casino and Resort
Hot Springs, AR
www.recycleark.org

12 – 13: Europack Summit 2024

Fairmont Le Montreux Palace
Montreux, Switzerland
<https://tinyurl.com/3zy4yu36>

15 – 21: National Truck Driver Appreciation Week

www.trucking.org/national-truck-driver-appreciation-week

17 – 18: Net Zero Conference 2024

Anaheim Convention Center
Anaheim, CA
<https://netzeroconference.com>

22 – 27: 39th Annual NAHMA Hazardous Materials Conference

Austin Renaissance Hotel
Austin, TX
<https://nahmma.org>

October

2 – 3: VIRTUAL EVENT: National Zero Waste Conference

<http://zwconference.org>

3 – 4: Women's Environment Leadership Summit

Sonesta Hotel
Nashville, TN
www.tnrecycles.com

5: 2024 SWANA International Road E-O

Dublin, GA
<https://swana.org/events/international-road-e-o>

7 – 9: Iowa Recycling & Solid Waste Management Conference

Grand River Center
Dubuque, IA
https://isoswo.org/Fall_Conference

9 – 10: EREF Fall Classic & Networking Event

Talking Stick Resort
Scottsdale, AZ
<https://erefdn.org/event/2024-fall-classic-networking-event>

15 – 17: Mississippi SWANA Fall Conference

Natchez Grand Hotel & Convention Center
Natchez, MS
www.msswana.org/event/2024fallconference

17 – 18: AmericaPack Summit

Four Seasons Hotel
Westlake Village, CA
<https://bit.ly/3Wj9xFX>

21 – 24: WASTECON® 2024

Gaylord Texan Resort & Convention Center
Grapevine (Dallas), TX
<https://wastecon.org>

22 – 24: Electronics Sustainability Summit

Hyatt Regency Austin
Austin, TX
www.electronicssummit.org

23 – 25: Coast Waste Management Association 2024 Conference: The Power of Collaboration

Victoria Ocean Pointe Resort
Victoria, BC
<https://cwma.ca/cwma-conference-2024-main-site>

28 – 30: NERC's Fall Conference In Partnership with the Center For Sustainable Materials Management at SUNY ESF

The Gateway Center at SUNY ESF
Syracuse, NY
www.nerc.org

November

5 – 7: Waste & Recycling Expo Canada

International Centre
Toronto, ON
<https://waste-recycling-expo-canada.us.messefrankfurt.com>



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Illinois Enacts Nation's 16th Battery Recycling Law

Illinois Governor JB Pritzker signed into law the Portable and Medium-Format Battery Stewardship Act, SB 3686, which will create a statewide program that requires battery producers to fund and manage the collection, transportation, and recycling of portable primary and rechargeable batteries (e.g., from cell phones, TV remote controls, and small power tools), as well as medium format batteries (e.g., from bicycles, hoverboards, and scooters).

This "extended producer responsibility" (EPR) bill was introduced by Illinois State Senator David Koehler and co-sponsored by 16 other state legislators. It marks Illinois' sixth EPR law and raises the total number of battery EPR laws in the U.S. to 16. Taking effect on January 1, 2026, the law mandates that companies selling or distributing batteries in the state participate in a battery stewardship plan, which implements the law. A stewardship plan(s) must be submitted by July 1, 2025, for approval by the Illinois Environmental Protection Agency (IEPA), which will oversee the program and ensure compliance.

Batteries contain valuable materials such as steel, manganese, and zinc that are mined using energy-intensive processes that emit greenhouse gases. Recently, lithium-ion batteries, which are used to power an increasing number of products, have caused fires at waste management facilities that have resulted in millions of dollars in damage, worker injuries, and tragic deaths. Stewardship programs, like the one enacted in Illinois, will save resources and reduce environmental and human health impacts.

"This new EPR law is an impactful win for Illinois, delivering needed collection convenience for consumers, reduced risk of fires at waste and recycling facilities, and enhanced public safety by removing toxins from the waste stream," said Christina Seibert, Executive Director of the Solid Waste Agency of Northern Cook County, a key bill advocate. "The Product Stewardship Institute's (PSI's) battery EPR policy model and technical expertise provided a strong foundation, supporting us in crafting a bill that benefits all Illinois residents and the environment." Seibert is also a PSI board member.

"This bill will result in an efficient and effective program that recovers valuable materials, reduces the growing risk of lithium-ion battery fires, and removes toxics from the waste stream," said Walter Willis, Executive Director of the Solid Waste Agency of Lake County, also a vital bill advocate and PSI board member. "We appreciate the engagement of IEPA, the Rechargeable Battery Association, Call2Recycle, the Illinois Chapter of the National Waste and Recycling Association, Illinois Manufacturers Association, Illinois Retail Merchants Association, and PSI in crafting this bill in a collaborative way that gained broad legislative support."

"Illinois' new law demonstrates the power of partnerships," said Scott Cassel, CEO and Founder of the Product Stewardship Institute. "Each stakeholder brought their unique expertise and perspective into the bill development process that led a unified bill that garnered widespread acceptance, paving the way for its speedy passage."

For more information, visit www.productstewardship.us.

Rural County with Global Recycling Impact: San Benito County Integrated Waste Management In Partnership with Central Coast RMDZ

San Benito County and the San Benito County Integrated Waste Management recently partnered with the California Product Stewardship Council (CPSC) to create an outreach video promoting the Central Coast Recycling Market Development Zone (RMDZ) and local, sustainability-focused businesses that prevent, reduce, reuse, or recycle waste materials through manufacturing or another value-added process.

The Central Coast RMDZ offers loans through CalRecycle for manufacturers engaged in sustainable business practices in addition to local technical assistance. Through the RMDZ program, San Benito County is engaging and encouraging regenerative, inventive business practices. Recycling mitigates waste created by residents and producers, allowing for new business opportunities. These resources allow manufacturers to find new ways to recycle, engage with other businesses, and support their communities.

The outreach video funded by San Benito County Integrated Waste Management featured San Benito County Chamber of Commerce Board Chairman Shawn Herrera, Granite Rock Marketing Services Manager Keith Severson, Fireclay Tile Environmental Health and Safety Director David Galaviz, and Integrated Waste Manager Celina Stotler. Granite Rock and Fireclay Tile had previously collaborated on a project funded by the Central Coast RMDZ, which featured recycled tiles created using excess materials from Granite Rock's quarry. Both businesses have their own sustainable businesses operations, but the funding provided allowed for additional creative reuse practices. County officials from Integrated Waste Management and the San Benito County Chamber of Commerce support local businesses in San Benito and encourage recycling opportunities across the county.

Regarding the assistance offered by San Benito County and the Central Coast RMDZ program, David Galaviz from Fireclay Tiles said "The programs that we have been exposed to have been awesome to us. Not only with actual value, but also with the contacts. I think if in the future they continue doing this, any company is going to benefit from that network. There's more than the actual monetary value here. There's more of this sense of community that is really going to help others." Integrated Waste Manager Celina Stotler is proud of the countywide green initiatives and said "the RMDZ program can further propel the desire of our local businesses to be greater environmental stewards."

For more information, visit www.calpsc.org.

Michigan Governor Whitmer Signs Medical Waste Law Amendment Providing Greater Flexibility to Medical Facilities Managing Sharps

Michigan's medical waste law has been updated to provide greater flexibility to medical facilities managing sharps. Governor Gretchen Whitmer signed Senate Bill 482 on July 23rd, amending the Medi-

cal Waste Regulatory Act. The amended law took immediate effect.

The revisions to the law apply only to sharps containers. Sharps include items like needles, scalpels, syringes, and lancets. The revisions allow sharps containers to be accumulated for up to 18 months from the date the first sharp is placed into the container before disposal is required if the container is no more than 75 percent full. Previously, sharps containers had to be disposed after 90-days regardless of how full they were. The law change will cut overall disposal costs for many regulated medical facilities and reduce the volume of plastic sharps containers that go to Michigan landfills.

Medical facilities should update their medical waste management plans and waste disposal contracts as soon as possible to reflect this change, but can begin implementing this change immediately.

For more information, visit www.michigan.gov.

US Composting Council Awarded \$4.4 Million Grant for Innovative Compost Application Trials

The US Composting Council (USCC) has been awarded a grant of \$4,400,750 as part of the USDA's 2023 Conservation Innovation Grants (CIG). This significant investment will fund the "Comparative and Ongoing Compost Application Trials to Guide and Incentivize Best Use" project, aimed at enhancing compost application practices across diverse agricultural systems.

USCC Executive Director Frank Franciosi said, "The compost industry has long known about the benefits of compost application on soil health and water holding capacity. Whereas good data does exist to support these claims, more data, guidance, and information dissemination will bolster the compost industry, and compost use. Soil health is a key component of the US Composting Councils mission and we are emboldened by this dedication of funds to assist with solidifying composts connection to conserving our soil."

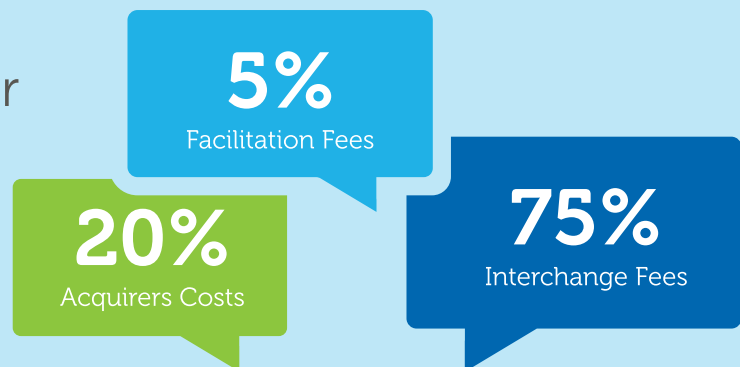
Project Overview:

The US Composting Council will lead this initiative in collaboration with top researchers and implementation partners across three states: California, Colorado, and Washington. The project will conduct 88 Soil Health Demonstration (SHD) trials to evaluate the environmental, economic, and social benefits of compost application. These trials will take place across various soil types, compost types/rates, and production systems. Key objectives of the project include:

- Assessing the impact of compost on soil carbon, water-holding capacity, and overall soil health.
- Developing accessible compost application guidance for producers and technical assistance providers.
- Informing potential updates to the NRCS guidance related to Conservation Practice Standard 336.

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- Providing interoperable data to improve the DayCent and MEMS models.

Through these comprehensive trials, the USCC aims to demonstrate the agronomic, social, and environmental benefits of compost, ultimately guiding best practices and incentivizing wider adoption of compost use in agriculture.

For more information, visit www.compostingcouncil.org.

Recycled Materials Association Honors Massachusetts Lt. Governor Kim Driscoll with the 2024 “Recycling Impact Award”

Massachusetts Lieutenant Governor Kim Driscoll was recognized as the 2024 winner of the “Recycling Impact Award,” presented by the Recycled Materials Association (ReMA) in partnership with the National Lieutenant Governors Association (NLGA). The award is presented annually to a lieutenant governor or second-in-command in state government who has demonstrated a commitment to resource conservation, sustainability, reuse, and recycling. “The recycled materials industry is a cornerstone of the American economy, transforming obsolete, surplus, or incidentally produced materials into fundamental components of our daily lives—from the roads we travel on and the cars we drive, to the buildings we occupy and the packaging that brings consumer goods and food into our households. The industry plays a pivotal role in helping the nation source more materials locally and sustainably, making our supply chain more resilient, our economy stronger, and our planet more sustainable,” said Robin Wiener, President of the Recycled Materials Association. “Lt. Governor Driscoll’s understanding of the importance of recycled materials and her unwavering support for recycling, sustainability, and innovative solutions make her a deserving recipient of the Recycling Impact Award. We are grateful for her support.”

“In Massachusetts, we know that sustainability is key to protecting the environment, and our administration is proud of the efforts we’ve made to invest in and improve our green initiatives,” said Lt. Governor Driscoll. “I’m honored by this recognition from the NLGA and ReMA, and look forward to continuing my efforts to make Massachusetts a national leader in recycling and sustainability.”

Lt. Governor Driscoll is a longtime proponent and supporter of sustainability initiatives, both as the Mayor of Salem and in her current role as lieutenant governor. As Mayor, she implemented programs that significantly improved the city’s recycling rates, addressed waste and litter, and joined the Compact of Mayors, a coalition of city leaders dedicated to reducing greenhouse gas emissions—of which recycling is a crucial contributor. At the state level, Lt. Governor Driscoll champions the Recycling and Reuse Business Development grants to support the private sec-

tor’s efforts to increase recycling, protect the environment, and create jobs. She has also joined the governor in leading the “Mass Leads Act,” an economic development bill aimed at transforming the commonwealth into a climate innovation hub while supporting small businesses, workforce development, and more.

For more information, visit www.recycledmaterials.org.

ASSP Expands Alliances to Advance Worker Safety

The American Society of Safety Professionals (ASSP) recently signed memorandums of understanding (MOUs) with three safety organizations that will expand the Society’s efforts to advance worker safety and health. The Society extended an existing alliance with the National Institute for Occupational Safety and Health (NIOSH) and created new strategic partnerships with the International Safety Equipment Association (ISEA) and Mechanical Contractors Association of America (MCAA). The three alliances are among many joint agreements ASSP now has in place to improve the well-being of workers in all industries.

“We recognize the benefits of collaboration to improve occupational safety and health practices while elevating the voice of our profession,” said ASSP President Pam Walaski, CSP, FASSP. “Together we strive to strengthen advocacy efforts, implement programs and create standards that reduce worker illnesses, injuries, and fatalities.”

Over several years, ASSP and NIOSH have worked cooperatively on conducting and implementing workplace safety research; promoting best practices and professional development opportunities; and encouraging employers to use safety and health management systems that are the cornerstone of successful businesses.

ASSP’s work with ISEA will better connect the Society to leading businesses and corporate leaders involved in the manufacturing, testing, and application of personal protective equipment and safety products. The agreement will also support the development of voluntary national consensus standards.

ASSP’s work with MCAA will widen the Society’s access to safety professionals through greater involvement in MCAA’s safety and health conference—one of the longest-running construction conferences. The annual event offers training and education courses designed to improve safety practices among mechanical contractors.

“Our mutual interests in improving the well-being of workers create valuable opportunities to work together,” Walaski said. “Our MOUs with a range of organizations enhance our ability to engage in more stakeholder meetings and safety education events throughout the year, and expand the safety profession’s influence in optimizing organizational performance.”

For more information, visit www.assp.org.

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The Future-Proof Business Model for Waste Management

As we stand at the crossroads of necessity and opportunity, resource optimization and circular thinking must be more than a department or an initiative—they must be the guiding principles that inform every decision and shape every strategy.

By **Samuele Barrili**



IN THE RAPIDLY EVOLVING LANDSCAPE OF WASTE management, a new paradigm has emerged—one that goes beyond mere disposal to encompass resource optimization, economic efficiency, and long-term viability. As the foremost expert in waste management alchemy, I have witnessed firsthand the transformative power of integrating these principles into the very core of business operations. This article is directed at waste management company owners who are ready to elevate their businesses and position themselves at the forefront of our industry.

The Integration Imperative

The days of viewing resource conservation as a mere add-on or marketing ploy are long gone. Today's discerning clients, both in the private and public sectors, are actively seeking partners who demonstrate a genuine commitment to responsible resource management. By weaving these principles into the core of your business model, you are not just attracting forward-thinking clients, you are future-proofing your enterprise against increasingly stringent regulations and public expectations.

Consider this: a 2023 global survey revealed that 78 percent of consumers are more likely to choose a product or service from a company with a strong track record in responsible resource management. For waste management companies, this translates to a significant competitive advantage. By positioning these principles at the heart of your operations, you are not just managing waste, but you are also cultivating trust, enhancing your brand reputation, and opening doors to new market opportunities.

Embracing the Circular Economy

At the crux of advanced waste management lies the principle of the circular economy. This model challenges the traditional linear “take-

make-dispose” approach, instead advocating for a system where resources are used, recovered, and regenerated in a closed loop. As waste management professionals, we are uniquely positioned to be the architects of this circular future.

Implementing four circular economy principles means rethinking every aspect of your operations, including:

1. *Design for Recyclability:* Collaborate with manufacturers to create products that are easier to recycle or repurpose at the end of their lifecycle.
2. *Resource Recovery:* Invest in advanced sorting technologies to maximize the recovery of valuable materials from waste streams.
3. *Upcycling Initiatives:* Develop innovative processes to transform waste materials into higher-value products, creating new revenue streams in the process.
4. *Collaborative Partnerships:* Foster relationships with industries that can use your recovered materials as inputs for their processes.

By adopting these principles, you are not just reducing waste, but you are also creating value and positioning your company as an indispensable player in the economy of tomorrow.

Waste Reduction Strategies: Beyond the Landfill

While efficient waste management remains crucial, true progress lies in waste reduction. Progressive waste management companies are now offering consultation services to help clients minimize waste generation at the source. This shift from a reactive to a proactive approach not only benefits the bottom line, but also creates new business opportunities. Consider implementing the following strategies:

- *Waste Audits and Consultations:* Offer comprehensive waste audits to clients, identifying areas for reduction and proposing tailored solutions.

• *Pay-As-You-Throw (PAYT) Programs*: Implement volume-based pricing structures that incentivize waste reduction among your clients.

• *Education and Outreach*: Develop programs to educate communities and businesses about waste reduction techniques, positioning your company as a thought leader in the field.

• *Smart Waste Management Systems*: Use IoT-enabled sensors and data analytics to optimize collection routes and schedules, reducing unnecessary pickups and associated costs.

By helping your clients reduce their waste footprint, you are not only providing added value, but also securing long-term partnerships built on trust and shared goals for efficient resource management.

Harnessing Advanced Technologies

The waste management industry is on the cusp of a technological revolution. Embracing cutting-edge technologies is no longer optional—it is a necessity for staying competitive and meeting evolving standards. Key technologies to consider include:

• *Anaerobic Digestion*: Convert organic waste into biogas and nutrient-rich fertilizer, creating a closed-loop system for food waste management.

• *Advanced Material Recovery Facilities (MRFs)*: Invest in AI-powered sorting systems and robotics to increase recycling efficiency and purity of recovered materials.

• *Chemical Recycling*: Explore technologies that can break down hard-to-recycle plastics into their chemical components, opening up new recycling possibilities.

• *Methane Capture and Use*: Implement systems to capture methane from landfills and convert it into usable energy or products.

• *Blockchain for Traceability*: Use blockchain technology to create transparent, verifiable records of waste management processes, enhancing trust and accountability.

By investing in these technologies, you are not just improving operational efficiency, but you are also positioning your company as an innovator in the field, capable of tackling the most complex waste management challenges.

The Road Ahead

As we stand at the crossroads of necessity and opportunity, the path forward for waste management companies is clear. Resource optimization and circular thinking must be more than a department or an initiative—they must be the guiding principles that inform every decision and shape every strategy.

The companies that will thrive in the coming decades are those that view waste not as a problem to be solved, but as a resource to be harnessed. They are the ones who will transform landfills into mines, waste streams into supply chains, and challenges into business opportunities.

As the waste management alchemist, I challenge you to reimagine your role in the global ecosystem. You are not just waste managers, you are pioneers, circular economy architects, and guardians of our

planet's future. By embracing these principles as your core business strategy, you are not just adapting to change—you are driving it. | **WA**

Samuele “Sam” Barrili is known as the go-to guy for helping waste management companies execute growth strategies. He began his journey in this field in 2009 after completing his degree in Toxicological Chemistry and joining a wastewater treatment company to develop its market. Over the years, thanks to his proprietary SAM Method (Stream Advanced Management), Samuele has assisted dozens of waste management companies across America and Europe in increasing their annual profits by more than 25 million dollars. In 2019, he transitioned from the C-Suite of a Chemical Hazardous Waste Company to launching his own MiM agency. His focus has always been on leveraging innovative business strategies to drive growth and profitability. Samuele began sharing content, educating, and consulting with waste company owners worldwide to help them transform their business results through strategic planning and execution. He has had the pleasure of working with world-class clients, implementing strategies that significantly enhanced their operations and profitability. Samuele can be reached at sam@sambarrili.com or visit www.sambarrili.com.

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Investigating Landfill Leachate Seeps

Preventing leachate from impacting surface water during construction and before the final cover placement is imperative. Proactively monitor seeps before they become more than a headache to keep your operations plan up-to-date and regulators happy.

By Daniel Ray

LEACHATE IS A LIQUID THAT HAS PASSED THROUGH OR emerged from solid waste and contains soluble, suspended, or miscible materials, as defined in Title 40 of the Code of Federal Regulations (CFR) part 258 and state regulations such as Chapter 62-701 of the Florida Administrative Code (FAC).

Leachate can contain a multitude of constituents of environmental concern, including ammonia, total suspended solids (TSS), chemical oxidation demand (COD), heavy metals, and per- and polyfluoroalkyl substances (PFAS), to name a few. Because leachate contains constituents that can harm human health and the environment, substantial consideration is given to capturing, collecting, and managing leachate as part of the final landfill design.

Preventing leachate from impacting surface water during construction and before the final cover placement is also imperative. When left unchecked, leachate seeps can travel downslope, impact surface water and the surrounding environment, compromise slope stability, and create a compliance issue for the waste facility.

Spotting Seeps

Leachate seeps from relatively wet landfills are a fact of life for some operators. They increase in intensity and frequency after a storm. Leachate seeps are a flow or leak of leachate out of the landfill surface side wall that may occur during landfill construction before placing the final cover to constrain the waste and leachate.

Leachate seeps can form in several ways, but the most common formation mechanism is leachate flowing downward through the landfill waste until it reaches a continuous lateral layer that is less permeable than the horizontal layer above it. An example of this is a highly compacted continuous waste layer with a more porous daily cover layer on top of it. The leachate traveling downward collects above the lower permeability layer. Then, it moves laterally through the higher permeability layer until it reaches a location where it can discharge, which is often a side slope surface. In essence, leachate will follow the path of least resistance, and when that path is lateral, it can form a leachate seep. Leachate seeps can be readily recog-

nized by the dark-colored liquid flowing out of a side slope, pooling on a side slope, or saturating areas with dead vegetation, as shown in **Figure 1, page 21**.

Get Moving

When first noticing signs of a leachate seep, it is important to investigate as early as possible to identify potential risks and develop design solutions to mitigate them. Landfill staff perform daily visual inspections, recording and sharing any sightings during daily landfill operations with other staff. Identifying the cause of a leachate seep is a crucial first step in the process and is most efficiently done through investigative measures.

Approach leachate seep investigation in various ways depending upon several factors that impact the investigation approach, including:

- Location of the seep on a side wall
- Proximity to surface water
- Volume of leachate flowing out of the seep

If the seep resulted from recent fill operations, investigations could occur through discussions with landfill operations to determine if specific weather conditions or placement of specific types of wastes or daily cover may have contributed to the development of the seep. Seeps that occur longer after placement of fill may involve investigating the seep area itself or obtaining liquid levels in gas extraction wells in the surrounding seep area to determine where leachate is accumulating and traveling through the landfill.

Implementing a Solution

After investigating and identifying the seep's source, develop and implement a design solution to remediate the seep. Multiple design solutions remediate seeps, but the common concepts include:

- Preventing the source leachate from reaching the landfill problem area through improved stormwater management or implementation of synthetic liners,

Figure 1: What appear to be shadows in the images are seeps of dark leachate.

Photos courtesy of SCS Engineers.



- Collect the leachate near the seep location before it exits the landfill surface by installing strategically located dewatering points with pumps or pumps in existing landfill gas wells,
- Diverting the flow to liquid collection infrastructure installed at the landfill using interceptor trenches or toe drains to direct flow to the existing collection infrastructure,
- Preventative planning helps prevent seeps due to erosion, especially in wet landfills.

come more than a headache. Proactively monitor the situation afterward and retain detailed maintenance records to keep your operations plan up-to-date and regulators happy. | **WA**

Daniel Ray is an Environmental Technician at SCS Engineers responsible for managing and overseeing CQA, multi-media sampling, stormwater, and compliance reporting of landfill, LFG, and composting systems for municipal and private clients. Reach him at scsengineers.com.

Record Keeping

Quick detection and remediation resolve seeps before they be-

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Best Practices for Developing a Successful Tire Program

Successful tire programs require more than just the rubber that meets the road. The advancement of tire and digital technology will continue to evolve the commercial industry, making it vital for fleets to stay informed about what tools are available to them and how best to use them.

By Timothy Netzel



The driver checks the tire monitoring sensor attached to the valve stem.
Photos courtesy of Bridgestone.

TO SAY TIRES ARE ESSENTIAL FOR A FLEET'S success would be an understatement. They are a top expenditure for most fleets operating in the U.S. and have a strong influence on profit margins because their performance determines the uptime or productivity of the vehicles they power forward. Because they rely so heavily on the performance of tires to operate successfully, many fleets have developed programs to maintain and protect their tire investments. The purpose of every tire program is to drive productivity, efficiency, and sustainability into operations.

When managing a tire program that optimizes vehicle performance, there is more than one way to be successful, because not all fleets are the same. However, the following tire program best practices can get you started on the right foot and be applied to your operation regardless of whether you are a long-haul trucking fleet of 100 vehicles or an urban waste and recycling fleet of just five.

Understand the Life Cycle of Your Tires

Knowing your tire usage is foundational to developing a successful tire program. If you are just starting, tracking the number of tires used is an excellent place to begin. This knowledge gives businesses a baseline of how many tires are needed to remain operational in a given month or year. As you develop your tire program, the goal will be to reduce these numbers by maximizing the lifespan of each tire.

Next, how are you measuring each tire? Is it total miles, cost per mile, or maybe cost per 32/nd? Each vocation has different ways of measuring and knowing what to measure is a baseline of how to drive efficiency. Establishing this will inform wheth-

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The driver reviews the data captured by his valve stem sensor to determine what tire maintenance is needed to ensure optimal performance and safety.

er you are using the right tires for your business and what kind of return you are getting from your investment. If you have an immediate goal of driving down cost per hour, ensure you are equipping your fleet with tires manufactured specifically for your segment. Thanks to a widespread abundance of tire dealers, an expert who can assist you in choosing the right tires is likely nearby. Global tire manufacturers have worked hard to establish large networks of advisors to help you choose the right tire and retread option for your business.

Lastly, and arguably the most crucial piece of information needed to understand the life cycle of your tires, is tracking the reason behind tire failures. A firm understanding of when and why a tire needs to be replaced can provide insight into the shortcomings of the tire's maintenance and the road conditions it experiences. For example, if one vehicle within your fleet experiences irregular wear more often than others, you may want to proactively schedule additional alignment checks and monitor tire pressure more closely. Over time, tracking this data will provide insight into operations, which allows fleets to take a more proactive approach to tire maintenance and ensure drivers are set up for success.

For additional insight, fleets can also leverage authorized dealers to conduct scrap tire analysis to help maximize the performance of future tires in your fleet and the longevity of your tire casings.

Quality Impacts Quantity

Choosing the correct tire to meet the needs of your business is paramount. If vehicles are running on the wrong tires, you could be creating more problems for your fleet and buying more tires than you need to run your business. Depending on the type of vehicle, location of business, and how you use your equipment in your fleet, you may need specialized tires at every position. Ensuring you have the correct type of tire located at each position helps maximize the longevity of each tire and your investment. It also keeps vehicles running at optimal levels.

This practice may be common sense to most fleet owners, but it is valuable to point out because the goal of any tire program is to get the best performance while maintaining safety. With this in mind, fleets must pay attention to the manufacturing process to ensure that the tires they select will be able to rack up miles.

This does not mean fleet owners need to become experts on tire manufacturing to make smart decisions. Fleets simply need a basic understanding of tire structure. For starters, not all tires are made with the same materials. On the surface, every tire may appear identical, but underneath are differences that can have a significant impact on the tire's performance. For example, most premium tires in the fleet space are engineered with high-quality tire casings. A tire's casing is the core investment or asset you are buying with a new

tire because when the tire becomes worn, you can retread the tire on that same casing. This means that investing in tires with premium casings can increase a tire's retreadability, which can extend the life of that tire, stretch more miles out of your investment, and reduce overall tire waste. For more than 50 years, fleets have been confidently using retreaded tires, which stand as one of the pioneering products in the commercial industry to showcase sustainability. By adding retreaded tires to a tire program, fleet owners can get more with less while also making a considerable positive impact on the environment.

Improve Through Data Insights

The emergence and use of innovative technologies have quickly become a best practice for any tire program continually optimizing to create higher levels of efficiency. The commercial industry has seen a wave of new products and solutions enter the industry in recent years that have provided businesses with new insights. Tire monitoring solutions, for example, have become a staple for businesses aiming to stay on top of tire health by turning insights into preventative actions. Tire monitoring solutions use sensors and cloud-based software to detect issues before they arise and relay information to drivers. The data is accessible from a mobile device and assists operators in making informed decisions about maintenance.

As a result, fleets that use data-driven insights take advantage of the knowledge at their fingertips and perform the maintenance needed to get more performance out of each tire, thus improving productivity and efficiency. Additionally, digital tools play a key role in the retreadability of the tire. The better you can preserve and protect a tire and its casing, the higher the likelihood of being able to retread it.

Evolve with the Industry

The advancement of tire and digital technology will continue to evolve the commercial industry, making it vital for fleets to stay informed about what tools are available to them and how best to use them. Equipment suppliers are now offering not only high-quality tires, but also the tools needed to understand and maintain them for operational and sustainability purposes. Successful tire programs require more than just the rubber that meets the road. Fleets that understand the value of data to help maintain their tires will only improve. | **WA**

Timothy Netzel is Director of TBR Brand Marketing at Bridgestone Americas. Timothy is responsible for the marketing strategy of the Bridgestone TBR product portfolio in North America. For more information, visit www.commercial.bridgestone.com.

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Choosing Design Elements for a Versatile, Long-Lasting Structure

Choosing building materials manufactured with quality and designed for a multitude of uses in tough conditions, will ensure a long-lasting, versatile structure that will last for years. By combining the finest engineering and designed materials, adaptable and resilient structures can offer robustness and longevity to waste management operations.

By Margaret Foley

BUILDING DESIGN IS CRUCIAL IN ANY APPLICATION, BUT for waste management facilities in particular, operations must prioritize strength and versatility above all to meet the demands of their industry. A dependable and functional building made with high-quality components will allow businesses to operate at peak efficiency for years to come, without having to worry about excess maintenance or costly issues arising with their structure.

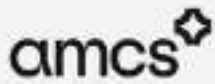
Steel frame structures have become increasingly popular amongst waste and recycling operations, and for good reason. Not only can they be customized around an individual business' unique requirements, but from the right manufacturer, operations will also benefit from a state-of-the-art design and engineering process that ensures the longevity of their building.

Left: Fabric cladding can be customized with door placement for optimized utility, and color specifications for aesthetics.

Below: I-beam frames can be customized with door openings to provide easy maneuvering and storage.



Photos courtesy of ClearSpan.



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Above: Fabric-clad Truss Arch frames allow for natural lighting with the option of supplemental electric lighting.
Left: Steel I-beam frames can be customized for optimal ventilation, easy maneuvering and waste transfer.

During that design process, two of the most important components for operations to consider are their building's framing and cladding. By incorporating the right combination of materials, businesses will end up with a versatile, reliable structure that enables them to stay profitable over time, while also maintaining an ideal environment for workers and any stored materials.

Steel Frames Built to Last

When designing a structure intended for long-term, versatile use, choosing the right frame is crucial. The most durable frames are made of steel, and the two most common types are Truss frames and I-beam frames.

Truss frames are combined networks of triangular sections connected at their ends by joints. Each longer truss network is then attached together to form a frame with excellent strength and long-term durability. Truss frames are relatively lightweight compared to other steel frames, and with high clearances and no required interior support posts, they can still be built to massive dimensions. Their arched design allows for additional height within the structure, providing extensive usable space, without sacrificing strength.

I-beam frames are another steel frame style known for versatility and longevity. While Truss Arch frames are made with steel

segments of hollow pipe, I-beam frames are built with solid steel beams. When cross-sectioned, I-beams look like the capital letter I, with two flat, horizontal edges connected by a longer flat vertical piece. Although I-beam frames are heavier than Truss Arch frames, they offer increased strength and resilience capable of enduring extreme weather. I-beam frames can also be built to massive sizes.

It is crucial that all Truss and I-beam frame components are made from the highest quality steel available. For optimal use and profitability, steel frames should be manufactured using the latest design technology. As well as using advanced engineering, thorough quality control checks are paramount at every stage of manufacturing and construction to detect any flaws that might cause future problems. An outstanding frame must be able to regularly withstand inclement weather, extreme climate conditions, and extensive wear and tear. In addition to passing rigorous quality testing during construction, all structures must also pass local building code requirements. Multiple inspection checkpoints during frame manufacturing will help guarantee a long, productive lifespan and promote overall building efficiency.

Choosing a quality Truss or I-beam frame can provide waste management operations with reliable, multi-functional structures that are ready for the long run and support greater profitability over time.

Functional, Dependable Cladding Choices

While frames are the bones of a structure, when planning a long-lasting, versatile building, a more outwardly visible design element is also one of the most important: cladding. Choosing the right cladding is key for weather-resistance and functionality, both in the short term, as well as in the long run.

In addition to offering protection from the elements, various cladding types can provide further benefits. Some cladding is climate sensitive, can help maintain a healthy environment within a structure or can provide aesthetic value. Steel framed structures are generally outfitted with three types of cladding material: polyethylene fabric, vinyl fabric, metal panels, or a combination.

Polyethylene fabric cladding is lightweight, cost-effective, easily installed, and is climate sensitive. It can allow natural light to permeate into the structure, while still maintaining a protective barrier. This can help operations save on regular electricity costs, as well as create a calming, natural ambience within the structure.

Fabric cladding is especially suitable for waste management processes like composting or large rubbish storage. A poly-clad structure without end walls, for example, can protect waste under cladding, allowing for sunlight permeation and unimpeded airflow. This eliminates the need for electric daytime lighting, and enables maximum ventilation throughout the structure, which can help prevent moisture buildup. Poly fabric cladding can also shield what is inside the structure from excess heat, mitigating bacterial growth and odors affecting working conditions. Alongside moisture management and odor mitigation, polyethylene fabric cladding may feature a rip-stop weave to help prevent tears from growing.

When operations prefer fabric cladding but need thicker, heavier cladding with increased durability, they might choose an architectural polyvinyl cover. Architectural vinyl covers consist of many layers, and their durability makes them both long-lasting and suitable for many purposes. Architectural vinyl fabric covers offer increased strength and durability compared to polyethylene cladding, while still allowing some light permeation.

If businesses prefer something more traditional, they might consider metal cladding. Metal cladding comes in many styles and is suitable for a wide variety of applications. Durable, cost-effective metal panels can be shaped in various corrugations, with connective grooves and joints that provide long use and strong resiliency. Many metal panels come with an anti-corrosive coating to extend their lifespan and protective features.

While metal cladding sometimes consists of single sheets, operations can also select insulated metal panels, which are comprised of a metal sheet, insulation, and another metal sheet sandwiched together. This style of cladding can provide excellent thermal insulation and helps maintain a steady temperature within a structure, keeping it cooler in the summer and warmer in the winter. Insulated metal panels offer a rugged cladding option with versatile applications.



Metal cladding comes in many styles and is suitable for a wide variety of applications.

In addition to the cost-effective impact on a structure's robust weather-readiness and interior environment, cladding can also enhance a building's appearance. Operations may opt to clad their structures in their company's brand colors, or colors that blend into the surrounding natural landscape for an environmentally congruent appearance.

The right cladding can help operations cut down on costs, both initially and monthly. Polyethylene, polyvinyl and metal cladding are versatile and long-lasting, and can provide the protection and support that waste management businesses of all types depend on.

Additional Design Elements for Efficiency and Longevity

As well as choosing from framing and cladding options, operations can also consult expert building designers and engineers to learn about additional design elements, and how they might be customized for a company's specific needs, now and for the future. Some projects might integrate elements like varying floor heights, door, window, or stair placements, along with unique structural features like conveyor belt openings, internal walls, and more. All waste management businesses in need of rugged, time-tested buildings can benefit from choosing quality frames and cladding, but adding the extra touch of project-specific custom designs can extend their structure's capabilities and lifespan even further.

When companies choose building materials manufactured with quality and designed for a multitude of uses in tough conditions, they choose a long-lasting, versatile structure that will last for years. By combining the finest engineering and designed materials, adaptable and resilient structures can offer robustness and longevity to waste management operations. | **WA**

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Using Telematics Integrations to Eliminate Fuel Fraud in the Waste Industry

Adopting technologies and best practices, solid waste and recycling companies can enhance their ability to prevent fuel fraud and theft. As the industry continues to evolve, leveraging advanced solutions such as telematics and fuel cards will be essential for maintaining competitive advantage and achieving operational success.

By Rush Akin

FUEL FRAUD AND THEFT REPRESENT A SIGNIFICANT financial and logistical challenge for solid waste and recycling companies, where operational efficiency and cost control are critical. Because waste fleets rely heavily on fleets of vehicles that consume large amounts of fuel daily, it makes them vulnerable to various forms of fraud. Addressing these issues through advanced technologies and strategic measures is crucial for maintaining profitability.

This article explores the nature of fuel fraud and theft, the role of telematics integrations in understanding fleet performance, and the use of fuel cards as a preventative measure against fuel fraud and fuel misallocation. This is especially important for fleets with a certain portion of their fueling done offsite, as this is where fraud is most prevalent.

What Does Fuel Fraud and Theft Look Like?

Fuel fraud and theft are prevalent issues in the waste management industry, where large

volumes of fuel are required for fleet and route operations. In order to identify effective preventative strategies, we need to first learn where it manifests itself:

- *Direct Fuel Theft:* Examples include unauthorized siphoning of fuel from vehicles or storage tanks. Fuel theft can occur during off-hours when security measures are minimal, or through bypassing inadequate locks and security systems. Thieves might use siphoning equipment or tamper with fuel tanks to extract fuel without detection.
- *Falsified Fuel Records:* Employees or contractors might manipulate fuel consumption records to cover up theft or misuse. This can include inflating fuel usage figures or reporting false refueling events. Falsified records are challenging to detect without accurate monitoring systems and can lead to significant financial losses.

Modern solutions allow you to set rules and spending limits for each card or driver, see where every dollar is spent, lock cards instantly, and monitor AI-enabled reporting to prevent fraud. Images courtesy of Roadflex.





- *Unauthorized Use of Fuel:* Fuel allocated for company vehicles might be diverted for personal use or for non-company vehicles. This type of fraud often involves misappropriating fuel resources, and without proper oversight, it can go unnoticed until significant losses have occurred.

- *Tampered Fuel Quality:* Another form of fuel fraud involves tampering with the quality of the fuel, such as diluting it with other substances. This not only leads to inefficient fuel usage, but can also damage vehicles, resulting in increased maintenance costs and operational disruptions.

The financial impact of fuel theft accounts for an average of 15 percent of expenses across the industry. By taking best practices from fleets from other industries, fleets need to implement data and technology centered solutions to automatically eliminate fuel fraud and theft.

Telematics Integrations: More Data to Understand Fleet Performance

Telematics technology provides a powerful tool for monitoring and improving fleet performance. In the context of fuel fraud prevention with fuel cards used for offsite fueling, telematics systems offer several advantages:

- *Real-Time Fuel Monitoring:* Telematics systems can track fuel levels in real time, providing immediate alerts if discrepancies arise between expected and actual fuel consumption. For example, if fuel levels drop unexpectedly or do not align with the vehicle's mileage, the system can trigger an alert to investigate potential theft or leakage.

- *GPS Tracking and Route Monitoring:* GPS technology allows for precise tracking of vehicle locations and routes. By comparing GPS data with fuel consumption records, companies can identify unauthorized deviations from planned routes or unexplained stops that may indicate fuel misuse. This ensures that vehicles adhere to authorized routes and operational schedules.

- *Driver Behavior Monitoring:* Monitoring driver behavior through telematics helps identify practices that contribute to higher fuel consumption. By analyzing driving patterns such as acceleration, braking, and idling, companies can address inefficient driving habits that might lead to increased fuel use and potential fraud.

- *Automated Reporting and Alerts:* Telematics systems generate detailed reports and automated alerts on various performance metrics. These reports help route managers track fuel usage trends, detect anomalies, and take timely actions to address any issues. Automated alerts for unusual fuel consumption or route deviations enable quick responses to potential fraud.

Using Fuel Cards to Prevent Fuel Fraud and Theft

Fuel cards are an effective tool for controlling and preventing fuel fraud and theft. This is particularly the case when central fueling is not possible or optimal. These cards offer several benefits and features that enhance fuel management and security:

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Above: Use modern fuel cards anywhere Visa is accepted and never worry about out-of-network fuel stations or fees again.

Right: Each fuel card should be linked to a cell phone number to protect it from abuse or fraud. The cards will be unlocked for use following a SMS card unlock process.

- **Controlled Fuel Usage:** Fuel cards enable companies to set limits on the amount of fuel that can be purchased by each cardholder. This control helps prevent excessive fuel purchases and reduces the risk of unauthorized use. Limits can be set based on individual vehicles, drivers, or locations, providing granular control over fuel expenses.

- **Transaction Tracking and Monitoring:** Fuel cards provide detailed transaction records, including the date, time, location, and amount of fuel purchased. These records help companies monitor fuel usage, detect discrepancies, and identify patterns that may indicate fraud. Regularly reviewing transaction records allows for early detection of potential issues.

- **Fraud Detection Features:** Modern fuel cards often include built-in fraud detection features, such as alerts for unusual purchase patterns or transactions outside of approved locations. For example, if a fuel card is used at an unexpected location or for an unusually high amount, the system can flag the transaction for further review.

- **Integration with Telematics Systems:** Fuel cards can be integrated with telematics systems to provide a comprehensive view of fuel usage. By combining fuel card data with telematics data, companies can correlate fuel purchases with vehicle performance and operational metrics. This integration enhances the ability to detect discrepancies and investigate potential fraud.

- **Access Control:** Fuel cards offer access control features that prevent unauthorized individuals from using company fuel resources. Cards can be issued to specific drivers or vehicles, and access can be restricted to designated fueling stations. This control reduces the risk

of fuel theft and ensures that fuel is used only for its intended purpose.

- **Enhanced Reporting and Analytics:** Fuel cards provide detailed reporting and analytics on fuel transactions, which can be used to generate insights into fuel usage trends and identify areas for improvement. Comprehensive reports help companies analyze fuel consumption patterns and develop strategies to prevent fraud and optimize fuel management.

- **Real-Time Monitoring:** Many fuel card systems offer real-time monitoring capabilities, allowing companies to track fuel transactions as they occur. This real-time visibility helps detect and address potential fraud or theft promptly, reducing the impact on operational costs.

Implementing a fuel card system involves selecting a provider that offers features aligned with the company's needs, integrating the system with existing fuel management practices, and training staff to use it effectively. By leveraging fuel cards, waste management companies can enhance their ability to prevent fuel fraud and theft while maintaining control over fuel expenses.

The most optimal type of fuel card will be a Modern Fuel Risk Management Platform, which is known to eradicate fuel theft and fraud at once. This type of solution helps waste management fleets achieve a real-time 360-view of their operations by integrating with fleet management software, accounting tools, telematics data and TMS solutions. The result is that operators are able to optimize fuel spend by creating spending profiles for each per vehicle and driver and leverage even more advanced AI-powered tools. Some examples include:

• **Fuel Level Validation:** Automatically track fuel tank capacity to ensure purchases do not exceed a vehicle's fuel tank capacity, and that the fuel you purchased was received by the correct vehicle. This prevents drivers from filling portable gas containers for personal use or from fueling non-employee vehicles while stopped at a gas station.

Fuel Type Purchase Verification: Automatically flag and decline fuel purchases if the fuel type does not match the fuel type of the specific vehicle.

• **Vehicle Location Validation:** By integrating with telematics, you can automatically verify that the correct vehicle, driver, and fuel card are all located at the same fueling location. If they are not, then you can automatically block the transactions from happening.

• **Card SMS Activation:** For extra security, before you use a fuel card, you will need to activate the card by following an SMS-based card unlock process. Once you do, the cards will be available for 15 minutes, before they are automatically locked again. This prevents the cards from being used in case they are stolen.

• **Retroactive Fuel Analysis:** For each vehicle, modern fuel management solutions will tie back gallons consumed to the number of miles driven. This identifies any potential fuel fraud or vehicle performance issues.

Takeaways

It is particularly important for route operators to address fuel fraud

and theft present in their operations, whether it is for onsite or off-site fueling activities. The first step is in understanding that the solution will require a multi-faceted approach, starting with adopting new technology solutions. Telematics integrations offer valuable insights into fleet performance, enabling companies to monitor fuel usage, detect anomalies, and improve operational efficiency. Fuel cards provide control and security, allowing companies to manage fuel resources effectively and prevent unauthorized use through powerful controls, analytics, and reporting.

By adopting these technologies and practices, solid waste and recycling companies can enhance their ability to prevent fuel fraud and theft. Additionally, as the industry continues to evolve, leveraging advanced solutions such as telematics and fuel cards will be essential for maintaining competitive advantage and achieving operational success. | **WA**

Rush Akin is an experienced veteran in the fleet industry, with more than 22+ years of experience in fleet management. Before joining RoadFlex, Rush served as the SVP of sales for Solera, where he was in charge of overseeing fleet sales and business development in North America. Prior to Solera, Rush worked with well-known brands in the industry, such as Rand McNally, Lytx, FourKytes, and Syntech Systems Fuel Master. Rush has a strong background in fleet and fuel management, as well as customer success. He can be reached at rush.akin@roadflex.com.

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Organics Recycling: A Shift in Mindset from “Hindrane” to “Harbinger” for Sustainability and Economic Opportunity

Food waste in landfills continues to encompass a sizeable portion of greenhouse gas emissions each year. While organics recycling programs are not new, improved understanding of the challenges and possibilities associated with these programs can help transform perceived complications in the process into an economic and environmental boon within a circular economy.

By Shi Chao Zheng

YOU HAVE LIKELY HEARD OF THE DINING CONCEPT “from farm to table,” but let’s reconsider that saying to coin a phrase that is more applicable to waste and recycling—an expression that describes how to repurpose those leftover food scraps from the meal in an environmentally conscious way. Instead, “from field to fertilizer” is a general yet relatively apt way to conceptualize how organics management programs fit into the broader framework of a circular economy, meaning that food waste or food byproducts set to be discarded can be recycled, repurposed or resold.

A New Purpose

Organic waste includes any material derived from plants or animals that will naturally decompose or break down over time. Food scraps, tree branches, leaves, lawn clippings, and other yard trimmings are all in this category and are considered types of organic waste.

When recycled or composted, these organic materials can serve a new purpose within a broader and cyclical lifecycle. Organic waste can be used to create new energy and power sources as biogas and biofuels that generate electricity and renewable energy. Food waste can also take on new life, repurposed as soil, soil additives or mulch



to regrow healthy plants and vegetables for your next meal. However, food and food scraps can pose the most harm to the environment when not diverted from a landfill through an organic recycling program.

According to data released last year from the Environmental Protection Agency, wasted food accounts for roughly “58 percent of methane emissions from municipal solid waste landfills.” This high percentage is caused by foods’ ability to break down relatively quickly once in the landfill, and this rapid decay generates methane, a greenhouse gas and leading contributor to the warming of the climate. A similar statistic from the EPA notes that greenhouse gas emissions caused from wasted food in the U.S. equates to emissions generated from more than 50 million gas-powered vehicles, underscoring the environmental risks when organic waste is not disposed or diverted properly, namely through facilities equipped to handle organic materials or anaerobic digestion.

Access and Investment in Facilities

Organics recycling programs are not new, but program adoption rates for businesses, especially organizations outside of coastal areas in the U.S. where specific regulations are in place, is not as widespread. This slow but steady adoption can be attributed to a lack of specific mandates that enforce these disposal practices, but it is also mainly due to a shortage of facilities that can process organic waste on a large scale.

The two main types of facilities best equipped to handle organic waste are industrial composters and anaerobic digesters. While an industrial composter is better equipped to process a wider range of materials—including food waste, yard waste, wood chippings and compostable plastics—anaerobic digesters or reactors can only process a more specific variety of organic materials, such as food scraps, grains, fats, and other food processing waste.

Limited access to these facilities, coupled with specific parameters around the materials that are accepted, can present a complicated roadmap for widespread implementation across certain footprints, but managed waste providers with teams of dedicated recycling specialists on hand can certainly help navigate that terrain until the availability of these facilities is more commonplace—there is always an option to start small and scale up over time depending on current waste streams and volume.

More investment and reinforcement of the long-term economic and environmental benefits may be critical for renewed growth in the industry, but as more facilities come online, this predicament may change in the next several years. This would open the door even further for managed waste providers to design and support organizations with more full-scale organics recycling programs that keep food particles out of the landfill and reduce greenhouse gas emissions.

Even without the presence of an industrial composter or anaerobic digester willing to take in organic waste, there are still other ways to meaningfully contribute to the organics recycling process. Many municipalities have food donation programs in place, so it is worthwhile to always double-check and donate leftover food deemed safe for consumption rather than tossing it in the trash.



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Improved Communication

One of the most important elements to ensuring recycled organic waste can meet its full, circuitous lifecycle is improved education to help consumers see the positive potential in the process rather than a perceived mindset that is one more obstacle in their day. Continuous education allows teams to better understand how an organics program minimizes environmental impact, as well as their individual role in impacting sustainability.

Simple additions to front- and back-of-house operations—such as posting clear signage and labels in and around high-traffic areas and on recycling bins or equipment that indicate which materials are and are not accepted—can help reinforce organic recycling behaviors while reducing the risk of contaminating the waste stream. To put it in perspective, many compostable utensils look very similar to plastic utensils—one can be recycled in an organic waste stream and the other cannot—and use pictures to help clearly indicate which can be tossed in the organics bin.

Also consider establishing streamlined and easily adaptable internal communications guidelines to disclose when onboarding new team members and be sure to revisit those protocols by sharing helpful reminders periodically throughout the year. Having procedures clearly outlined and documented enforces accountability and supports long-term retention of organics recycling best practices even as staff levels may fluctuate.

Increased Adoption

Amid growing levels of generated food waste, staying steadfast and committed to organic waste recycling is invaluable, as a circular economy model is simply not feasible without further education, increased adoption of organics recycling programs, and a positive mindset that a few extra steps in the everyday waste disposal process can support sustainable change. For further guidance or to identify access to organics recycling services and facilities, consider consulting with a professionally managed waste services provider to audit current waste streams, review options and design a program that addresses achievable goals to transform organic waste from “field to fertilizer.” | **WA**

Shi Chao Zheng is a senior recycling specialist at Waste Harmonics + Keter Environmental Services, where he works directly with customers to support their waste diversion goals. He has more than eight years of experience in the waste management industry, creating custom recycling programs for commercial retail, commercial office and industrial clients, including specializations in waste program design and implementation, employee training and waste audits. Zheng holds a master’s degree in sustainability management and is also a certified TRUE Advisor.

Waste Harmonics is a unique, technology-enabled managed service provider in the waste industry. The company manages waste contracts and third-party vendors, and ultimately helps customers with what every business generates: waste. Waste Harmonics creates customized, technology-driven program solutions that address waste generator expectations and requirements, dealing with single-source management of service suppliers, quality of service, reduction of costs, data and reporting analytics, consolidated invoicing and landfill diversion. Waste Harmonics works with diverse business clients across North America to deliver cost savings, consolidation of invoicing and communications, and recycling and sustainability strategies. For more information, call (585) 924-9640, e-mail info@wasteharmonics.com or visit www.wasteharmonics.com.

Keter Environmental Services is a data-first recycling and waste management company that provides first-class sustainable recycling and waste programs nationwide. Keter works with forward-thinking companies who understand that increasing landfill diversion rates, improving operational efficiency, and using technology for data and reporting are crucial to an effective and sustainable business strategy. Keter approaches every opportunity with the knowledge that each company they work with is unique in its waste streams, needs, goals and challenges. For more information, visit keteres.com.

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Objects in the Mirror are (More Expensive) than they Appear!

Let's talk about the elephant in the room, the acquisition cost of assets for independent waste haulers. In this article, we highlight the importance of monitoring market rates and exploring opportunities like leveraging collective buying power to drive significant operational savings and right-size your spending.

By Cassidy Brauns

WASTE HAULERS ARE TRAINED TO AIM HIGH AND KEEP their eyes moving to “see the big picture.” In a literal sense, drivers are told that we should check at least one of our mirrors every five to eight seconds. By seeing the big picture and constantly checking our mirrors, we set ourselves up to make an informed decision and

deal with variable changes. While the industry implores that drivers check their rear-view mirrors, are you, as an independent waste hauler, checking your rearview mirror as it relates to your Capital and Operational Expenses?

Checking market rates and your vendors' pricing is not only good for the health of your business, but potentially good for your pocketbook.
Photo courtesy of Gatehouse Purchasing.



Unfortunately, many independent haulers are often starting behind the 8-ball from the inception of their companies. They have no established credit, limited capital resources, and have gone “all-in” to pursue the American Dream. However, these haulers possess a passion and a drive to inherently change their marketplaces and bring enhanced customer service to their end-users. With no business history to tout, new haulers often get rejected by vendors (or combat a “cash up-front” scenario), especially for higher-ticket items like trucks, onsite fuel tanks, and containers. Then along comes their saving grace: the vendor that gets it; the partner that is willing to take the chance; the relationship that puts the proverbial wheels of the American dream into motion.

Not only do these vendors and their staff become partners, but they also often become friends inside and outside of the industry. After all, they trusted the small hauler, gave them an out, and saw the bigger picture. However, over time pricing increases, and as a hauler’s demand for assets becomes greater, so does their pricing.

Aggregating Buying Power to Bring the Big Picture into Focus

It is time to check the “rear-view mirror” of your business. We work with a wide array of independent waste haulers ranging from 10 trucks to fleets of 200+ trucks. The goal is to aggregate your buying power to acquire assets more efficiently. On average, an independent waste hauler of roughly 25 to 40 trucks has the opportunity to squeeze an average of \$20,000 to \$30,000 annually in OpEx savings and another \$20,000 to \$30,000 annually in CapEx savings out of their operating costs (depending on the Line of Business offered).

Oftentimes, the savings are even substantially higher than that. In a recent example, a lubricant vendor with a 40+-year relationship with an independent hauler had been overcharging them by ~\$3.60/gallon on AW-46 (direct product specification match). That is a \$50,000+ overcharge at an estimated 14,000 gallons in annual consumption. In another example, a tire dealer was charging a roughly \$200-per-tire premium for a virgin 315/80R22.5 casing. At an estimated 125 tires a year, that was another \$25,000 taken out of the pocket of a small hauler.

Checking the Rearview Mirror: Monitoring Pricing and Increasing Buying Power

So how do we fix this? The answer is simple: by checking the rear-view mirror. The rear-view mirror is the monitoring and analyz-

ing a hauler’s pricing based on the increased buying power available due to their increased asset consumption. As we mentioned above, as a hauler’s demand for assets becomes greater, so does their pricing. So, how do we check the market?

Perhaps the simplest way is to request quotes from multiple vendors. However, anyone in the industry knows that manufacturing quality and customer service drastically vary not just from manufacturer to manufacturer but also from market to market. Additionally, pricing on products like front-load cans and roll-off boxes move with indexes that have volatile swings from week to week. That being said, measuring a product’s quality from an “apples to apples” perspective and understanding the timing of the issued pricing becomes incredibly important.

Other ways to check the market are understanding the ebbs and flows of commodities such as rolled steel and resin, following market trends and major movements such as the UAW strike and the impact that may have on pricing, using industry friends and veteran operators, or look for outside help. The market is a dynamic beast and there is no right or wrong way to do this effectively. Ultimately, checking the rear-view mirror does not mean changes are necessary. You might be able to stay in neutral, but it is important to remain aware of your surroundings to avoid losing focus on the big picture.

Ultimately, checking market rates and your vendors’ pricing is not only good for the health of your business, but potentially good for your pocketbook. With an average EBITDA multiplier of 7x to 8x in today’s market, a \$50,000 pick-up to the bottom line could result in an additional \$400,000 at exit.

Relationships Matter in the Waste Industry

Relationships matter and doing business with people who you trust and who trust you will always trump a dollar of savings here or there. As you take the “ride up the elevator” with your business, ask important questions along the way. Also, ask for constant feedback because at the end of the day jumping over dollars to save pennies does not always make business sense. Jumping over dollars to save \$50,000 is a different story. | **WA**

Cassidy Brauns is President and CEO of Gatehouse Purchasing, where they work with a wide array of independent waste haulers ranging from 10 trucks to fleets of 200+ trucks. If you are a small hauler interested in learning more about market rates and how to effectively check them, call (704) 740-2383 or e-mail cassidy@gatehousepurchasing.com.



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Extended Producer Responsibility: Getting to Effectiveness

Establishing EPR goals is a complex process, however, developing metrics other than the usual convenience factors for performance holds promise for truly effective EPR collection program goals.

By David Nightingale, CHMM, S.C.

IN THE PAST TWO DECADES, EXTENDED PRODUCER Responsibility (EPR) in the U.S. has made great strides moving towards a more circular economy for the management of hazardous and other materials, those which used to be inappropriately disposed of in the garbage. Nonetheless, to more effectively implement these EPR programs, more scrutiny needs to be applied the metrics used to establish levels of effectiveness. This requires looking beyond the common convenience goals contained in many EPR laws.

The Convenience Standard

A common criterion for which state EPR programs are required to meet is a certain level of statewide convenience. A recent example of this is from Illinois' recent Paint Stewardship Act (SB 836). That law includes the goal to provide that: "(A) at least 90 percent of State residents shall have a collection site, collection service, or collection event within a 15-mile radius, and (B) at least one collection

site, collection service, or collection event for every 50,000 residents of the State."

This type of convenience standard is a derivative from the early days of recycling where it was common for local jurisdictions to implement requirements for neighborhood drop-off stations for common recyclables, prior to the more common curbside collection trucks which dominate recycling today. Recycling effectiveness metrics have since evolved and so too should EPR effectiveness metrics.

Convenience Does Not Equal Effectiveness

To meet the letter of this recent Illinois paint stewardship law, a thrifty stewardship program manager looking to limit their costs could provide one collection event per year in strategic locations around the state and be done. Based on the long history of household hazardous waste (HHW) collection events across North America, where leftover paint is the largest single waste type collected, you will at best reach some low level of percentages of households per year. Individual collection events for HHW often attract only a fraction of a percent to a few percent of households in the jurisdiction on an annual basis. In a similar vein, a collection point that is only open once per month for a few hours may also be expected to be relatively ineffective in serving a local community. To be truly effective in collection of HHW, including leftover paints, a program needs to serve around 13 to 14 percent of all households per year.¹



Mike Deacon with full boxes of oil-based and latex paints waiting for shipment to PaintCare, Thurston County WA.

Photos Courtesy of Special Waste Associates.

Establishing and Evolving Effectiveness Goals

Vermont has long been a leading state in adoption of EPR laws under the long-standing leadership of Jennifer Holliday of the Vermont Product Stewardship Council since 2008 and the Director of Public Policy and Communications at the Chittenden Solid Waste District. Vermont passed new EPR legislation in 2023 (Act 58); this time encompassing the larger universe of HHW not already covered by paint, battery, and other prior adopted Vermont EPR laws.

This 2023 Vermont law included a beginning collection performance goal of 5 percent of household participation per year. Future participation goals will be proposed by the stewardship organization. Future percent participation goals will be designed by examining data from waste sorting analysis and other relevant factors through a review process every five years by the stewardship organization and the Secretary of Natural Resources. This law allows the flexibility of adopting future levels of participation at regular intervals and actual evaluation of effectiveness based on the EPR program collection results, what is continuing to be disposed of in the MSW stream, and other credible information sources.

Depending on where you live in Vermont, local HHW collection programs experience different levels of participation. In some jurisdictions, such as Addison County Solid Waste Management District and Chittenden Solid Waste District, annual HHW participation lev-

els of 12 percent and more are routinely reached. These jurisdictions have long-standing permanent collection facilities open many hours all year round. In some other parts of the state the annual level of participation are only a few percent. The 5 percent participation goal should help lower performing areas to catch up to those who have already achieved effective levels of service.

Vermont has been working with local jurisdictions to provide a more complete statewide HHW collection infrastructure to achieve higher levels of annual participation. A 2019 VT Department of Environmental Conservation study suggested that this might be accomplished by expanding the number permanent HHW collection facilities.² The state is now encouraging the development of additional regional permanent HHW collection facilities in strategic locations through a grant program.

Waste Management and Effectiveness

Looking back to the leftover paint issue for a moment. It is laudable that some PaintCare product stewardship state programs are recycling 80 to 90 percent or more of latex paint into new paints. However, this addresses only a success regarding the proportion of collected latex paint managed at the higher levels of the normal waste management hierarchy. This does not address the overall effectiveness of collecting the total amount of paint that is leftover.



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Above: Fluorescent lamps destined for EPR Processing, Thurston County, WA.
Left: Leftover Paint for PaintCare, Thurston County, WA.

There is a commonly used estimate that approximately 10 percent of paint sales become leftover paint that needs to be appropriately managed.³ Data on overall aggregate paint sales by state is available. Using the 10 percent leftover estimate of total annual paint sales could be an even more direct path to establishing ERP goals for paint stewardship programs. A 10 percent paint collection metric would be a more direct way to effectively measure the effectiveness of that EPR program at the state and national level. Of course, leftover paints are often stored for touchups. During the national paint product stewardship initiative that led to the formation of PaintCare, an estimated average age of leftover paint was found to be 7.4 years. So, the 10 percent of leftover paint per year would need to be timed for collection with a delay of about 7.4 years.

Unlike paint, many other problematic wastes that are difficult to handle, such as electronics and batteries, are not consumed during use. In those cases, sales estimates and the expected average useful life estimates can inform establishment of meaningful goals for collection effectiveness and indexing sales to collection timing goals. For example, if a million pounds of lithium-ion batteries are sold during 2024 in a state with a useful life expectancy of four years, then a collection goal based on those batteries becoming waste in 2028 would be established. Such goals would need to account for “leakage” due to inappropriate disposal practices which might be quantifiable through periodic waste sort analysis. One hundred percent recovery of all problematic wastes is not feasible. However, considering 100 percent

of sales as the baseline value of total volumes of the future problem waste stream is a good place to start development of realistic collection effectiveness goalsetting.

Difficult Problems Are Worth Solving

In reality, establishing effectiveness goals is a complex process, as there are many assumptions that must be made to design the method and metrics that are rational and achievable for EPR program collection. However, solving difficult problems is very often a worthy pursuit and, in the EPR/circular economy context, holds the promise of a cleaner future for us and those who must live with our leftovers.

| WA

David Nightingale is the Principal at Special Waste Associates. Special Waste Associates assists communities developing or upgrading HHW collection infrastructure and operations. He currently serves on the North American Hazardous Materials Management Association (www.NAHMMA.org) Board of Directors. You can reach David at (360) 259-6497 or e-mail Dave@SpecialWasteAssoc.com or

Notes

1. <https://wasteadvantagemag.com/hhw-collection-effectiveness-metric/>
2. Product Stewardship Institute, Inc., Report for Vermont Department of Environmental Conservation: Research on EPR Programs for HHW, Final Report, Boston, Feb. 7, 2019.
3. The 2023 Illinois Paint Stewardship Act citing this 10 percent leftover paint estimate, which originated during the Paint Product Stewardship Initiative facilitated by the Product Stewardship Initiative in the early 2000s.



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Advantages of Air Technology Solutions in Waste Management

Air technology is a versatile and essential component of modern waste management strategies, offering substantial economic, operational, and environmental benefits, which can be included as part of the initial design of the recycling facility or retrofitted to suit the needs of the operation.

By Dave Lansdell

AIR TECHNOLOGY FOR RESOURCE RECOVERY OFFERS numerous advantages that enhance the efficiency and effectiveness of modern waste management and recycling processes. Technological advances, and importantly, response to waste operators' requirements over recent years, means there are now many methods that work well to recover valuable and recyclable material, rather than them ending up in a landfill. Air technology is now widely accepted

as one of the key technologies used to support recycling of various material streams.

How Does Air Technology Work?

Air technology is a versatile and efficient method used in various waste separation processes. Not only can air be used to move product from A to B through a ductwork system or to handle a variety of

Airlift flexible plastic packaging recovery system. Images courtesy of Impact Air Systems.



hazards such as dust, fumes, or odors, but it can also be used effectively to separate or grade material. Air separation works by leveraging the differences in physical properties such as weight, size, aerodynamic characteristics, and density of the materials in the waste stream.

Accurately Sort Waste Material

One of the primary benefits is its ability to rapidly and accurately sort waste materials based on their physical properties, such as density, size, weight, and aerodynamic characteristics. Like all technology used in the recycling industry, the key to success is selecting the right solution for the application and applying it in the correct position in the recycling process. Air knives and wind sifters or other similar methods offer high throughput basic levels of heavy/light separation or polishing, while zigzag or air classification offers much more precise and higher quality separation. These technologies can quickly separate lighter materials such as paper, plastic films, and flexibles, and small particles from heavier items such as metals, aggregates, rigid plastics, and glass.



Flexible plastic packaging collected via Impact Airlift System.

Improved Purity

Another major advantage is the improved purity of recovered materials. Air technology can differentiate between different types of materials, resulting in higher quality and less contaminated recycled outputs. For example, the final de-dusting of granulated plastics before extrusion, removal of unpickable light contamination from gypsum recycling or MRF glass, removing unwanted aggregate from finished SRF, through to capturing flexible film plastics at optical separators used to quality control the final material streams such



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Glass clean-up system (Zigzag Air Classifier) in material recovery facility.

as OCC (old corrugated containers) or N&P (newspaper & paper). This increased purity makes the recovered materials more valuable and easier to process in subsequent recycling stages, enhancing the overall economic viability of recycling operations.

Reducing Manual Sorting

Using air technology reduces the reliance on manual sorting, lowering labor costs and minimizing human error, and can also be used to enhance the performance or uptime of other key equipment in the recycling process, such as screens and optical separators. It also decreases the wear and tear on machinery that can occur with other separation methods, such as mechanical sorting, which often involves more contact and friction. This leads to lower maintenance costs and longer equipment lifespan.

Mitigating Environmental Impact

Environmental benefits are also significant. Dust control can be a major benefit to using air separation technology, reducing the respiratory risk to staff and personnel, and reducing the need for house-

keeping and the fire risk due to dust, by treating the air used for the separation using fully compliant dust filters. Additionally, dedicated dust control solutions are becoming more common features of the recycling process and are being considered during the design phase or as part of major plant upgrades. By efficiently separating and recovering recyclable materials, air technology reduces the volume of waste sent to landfills, mitigating the environmental impact of waste disposal. It also supports the circular economy by promoting the reuse of materials, conserving natural resources, and reducing the need for virgin material production.

An Essential Component

Air technology systems can be integrated with other advanced sorting technologies, such as optical sorters, screens, and magnetic separators, to further enhance recovery rates and efficiency.

When you identify inefficiencies in current processes, ensure that you have the budget and infrastructure to support the investment, face regulatory pressure to improve sorting accuracy, and aim to align with sustainability goals. By considering these factors, you

can determine the optimal moment to enhance your waste management operations with air technology, leading to better resource recovery, cost savings, and improved environmental outcomes.

The integration capability makes air technology a versatile and essential component of modern waste management strategies, offering substantial economic, operational, and environmental benefits, which can be included as part of the initial design of the recycling facility or retrofitted to suit the needs of the operation. | **WA**

***Dave Lansdell** is Technical Sales Director for Impact Air Systems, Dave has worked in the engineering sector for more than 25 years and in the air conveyance and recycling sector for 20 years, securing contracts in various recycling facilities across the U.S. and around the world. His extensive knowledge and expertise in this field is unparalleled. He has been an exemplary leader and contributor to the exponential growth of Impact, which led to the buy-out of the company, by Swedish technology firm, Addtech, in 2021. Dave is supported by arguably the best team of technical sales managers, project managers and installation engineers, ensuring that the*



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Sustainability: A Key Growth Lever Helping Transform the Environmental Services Sector

Significant capital inflows are coming into the environmental services sector, resulting in a high level of platform formation and add-on acquisition activity. The favorable regulatory climate, governmental funding tailwinds, and sustainability imperative provide a foundation for defensible growth.

By Efram Kaplan and James Cocita

OVER THE LAST FEW YEARS, THE ENVIRONMENTAL sector has moved closer to the spotlight. The relative stability of the waste and environmental sector has long attracted investor activity because of its essential nature and traditionally strong growth profile. Customers are increasingly pursuing sustainability-focused solutions from their service providers, leading companies to seek acquisitions that can more rapidly build scale and expand service capabilities into adjacent technologies, waste treatment categories, and end markets. The companies that are able to adapt will be the more attractive assets for the investor community.

In our latest Insider covering the Environmental sector, we examine the key drivers that are leading to the prioritization of sustainability, the role technology plays in helping companies achieve their sustainability initiatives, and how select waste-to-value solutions are accelerating the transition towards a more circular economy.

How Technology is Transforming Sustainability in the Waste and Environmental Sectors

Technology is revolutionizing the recycling market, making it possible to use artificial intelligence (AI)-based solutions and robotics to dramatically improve recovery rates and reduce contamination while improving recycling economics. Proven waste-to-energy technologies such as anaerobic digestion (AD) are seeing improved use and rapid deployment, converting waste into valuable renewable energy. Technology developments to streamline the AD process, for example, target pre-treatment systems to increase gas production and software solutions including the use of sensors to improve processes.

For example, technology has played a significant role in advancing WM's sustainability goals and strategy, particularly over the last few years. Automated technology such as optical scanners and intelligent sorting equipment at certain of WM's recycling facilities offers ben-

efits related to volume, efficiency, cost, and material quality, which all contribute to creating a more economically viable recycling process for everyone involved, including customers.

As the largest recycler of post-consumer materials in North America, WM plans to invest more than \$1 billion from 2022 through 2026 to build new and update existing recycling facilities with state-of-the-art technology to increase the number of materials managed that can then be recycled and repurposed into new products. These planned investments are expected to result in nearly 40 new and upgraded recycling facilities, which is expected to add 2.8 million incremental tons of capacity annually.

“With the benefits of technology, WM's recycling facilities are expected to manage greater volumes, capture materials that have been more difficult in the past and deliver higher quality outputs. That helps the economics and, most importantly, can make recycling accessible and more sustainable for more customers in more markets,” P.J. Foote at WM told Brown Gibbons Lang & Company (BGL).

In August, Rumble Recycling & Resource Center announced the opening of a new recycling facility that is considered to be the largest, most technologically advanced of its kind in North America. It will increase the processing capability from 160,000 tons of material a year to 250,000 tons. It also increases the material recovery rate to 98 percent.

Exploring the Emerging Opportunities in Waste-to-Value Solutions

Waste-to-value initiatives continue to play a critical role in the successful transition to a circular economy—a model of production and consumption where materials never become waste and nature is regenerated (**Figure 1**). Techniques such as anaerobic digestion and composting and other processes like pyrolysis, enable waste mate-

rials to be converted into new products or energy sources, thereby reducing the environmental impact of waste disposal and mitigating greenhouse gas emissions.

One area of waste-to-value that holds significant potential is the biogas industry. The American Biogas Council has identified 10,000 new sites as “ripe for development,” including 4,000 waste resource recovery facilities and 2,000 food scrap-only systems. Capital inflows are supporting the growth of AD systems across the country. Among the investors to announce AD investments over the last 12 months were Ares Management (Burnham RNG and Dynamic Renewables), Quinbrook Infrastructure (Purpose Energy), IFM Investors (Green-GasUSA), and Enbridge (Divert).

Other notable investments include Vanguard Renewables (Blackrock, 2022) and Bioenergy Devco (2021), both of which announced plans for aggressive expansion. Blackrock stated the goal to have more than 100 digesters in operation across the U.S. by 2026, a sizable expansion from the six in operation in Massachusetts and Vermont at announcement. BDC has constructed over 250 facilities worldwide.

The composting sector has experienced an influx of investor capital, according to L.E.K Consulting. Large environmental services companies are expanding their portfolio of composting facilities. Last year, WM added composting capabilities, including several new facilities and investment in the expansion of existing compost operations.

WASTE MANAGEMENT HIERARCHY



Figure 1

The circular economic model follows the 3R approach of “reduce, reuse, and recycle” to conserve resources and minimize waste and is aligned with the EPA’s Waste Management Hierarchy. The Waste Management Hierarchy ranks the ways for managing waste streams and materials according to what is best for the environment communicating core messages of waste prevention, resource conservation, and the efficient use of materials and energy.

Another key market development in the waste-to-value economy is the development of alternative fuels such as renewable natural gas, renewable diesel, and sustainable aviation fuel, among others. Renewable natural gas (RNG) is a growing market driven by energy

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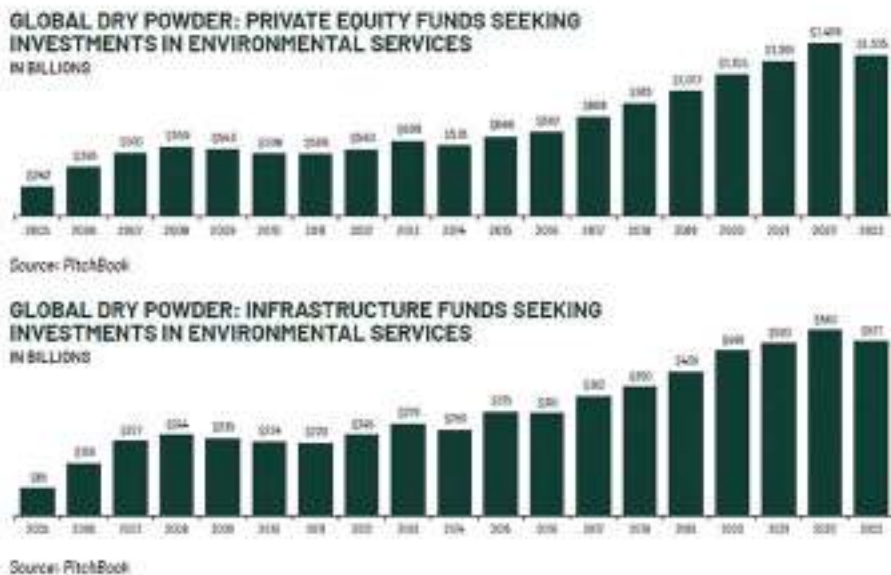
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Figure 2

According to Pitchbook, private equity funds have a keen interest in this sector, with those specializing in environmental services amassing more than \$1.3 trillion globally



security and demand for natural gas, corporate focus on low-carbon energy solutions, and related low-carbon policy incentives. Versatile feedstock ranging from municipal solid waste to agricultural waste can be used in the initial production of RNG.

The U.S. is seeing rapid expansion with large environmental services companies announcing substantial capital investments in RNG projects. WM expects to commission five new RNG facilities by the end of 2024, as part of a longer-term plan to invest in approximately 20 new landfill gas-to-RNG facilities through 2026. The company has been operating WM-owned RNG plants since 2016. One of WM's sustainability ambitions is to target the beneficial use of 65 percent of its captured landfill gas by 2026.

In June 2023, GFL completed the construction of its largest landfill gas to RNG projects, Emerald RNG, with its joint venture partner, OPAL Fuels. By 2030, at least 85 percent of GFL's CNG fleet will be powered by RNG fuel, including RNG produced from its landfills.

Republic Services expects at least 8 RNG projects to be completed in 2024. Five RNG projects came online in 2023. The company has set a long-term sustainability goal to beneficially reuse 50 percent more biogas by 2030.

Sustainable Investment in Environmental Services

Significant capital inflows are coming into the environmental services sector, resulting in a high level of platform formation and add-on acquisition activity. Investors are attracted to the market's stable demand, viewing waste as an essential service and, therefore, more recession resilient. The favorable regulatory climate, governmental funding tailwinds, and sustainability imperative provide a foundation for defensible growth.

Industry consolidators continue to pursue tuck-in acquisitions that are anchored in delivering sustainable solutions, while also helping to diversify and expand service capabilities to support core growth strategies. "Certainly, sustainability plays into our M&A decision mak-

ing. The core of what we do is so tied into sustainability that it must be part of the calculus," said Brian Brantley at VLS in an interview with BGL.

Significant dry powder is available in the market, which allows the creation of acquisition opportunities for companies that have a strong emphasis on sustainability in their operations. According to Pitchbook, private equity funds with an environmental services preference have amassed more than \$1.3 trillion in capital globally while infrastructure funds have accumulated more than \$500 billion (Figure 2).

Best-in-class assets will continue to attract compelling valuations as the investor community and strategics continue to seek ways to deliver strong year-over-year growth while diversifying their mix of sustainability-driven solutions. The favorable regulatory environment, governmental funding tailwinds, and sustainability imperative will provide a foundation for defensible growth in 2024 and beyond.

|WA

Effram E. Kaplan is a Managing Director and the Head of BGL's Services and Infrastructure verticals. With more than 25 years of corporate financial advisory experience, Effram's knowledge spans all facets of guiding an organization's strategic and capital markets needs, including mergers and acquisitions, debt and equity capital, and shareholder and board advisory. His clients primarily include family and entrepreneur-owned, private equity-backed, and publicly traded companies. Effram can be reached at ekaplan@bglco.com.

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Second of Two Parts

PFOA and PFOS Hazardous Substances? What Chevron and Loper Bright Could Mean for Regulations

How your organization can navigate PFAS during these challenging times from a regulatory perspective.

By Sallee Murphy and Leanne Hersey

IF YOU CAUGHT PART 1 OF THIS TWO-PART SERIES (“PFOA and PFOS Added to CERCLA Hazardous Substances List: What You Need to Know,” *Waste Advantage Magazine*, August 2024), the article discussed the implications of the U.S. EPA’s final rule, effective July 8, 2024, designating PFOA and PFOS as hazardous substances under CERCLA (Superfund). To recap:

- According to the law, landfill and solid waste disposal facility operators must now report releases of these chemicals that exceed one pound within a 24-hour period.
- The designation is significant due to the high concentrations of PFAS in landfill leachate, which poses treatment challenges as

conventional methods are costly and often shift the contamination rather than eliminate it.

- While municipal landfills are exempt from cleanup costs, they still face increased monitoring, reporting, and management responsibilities to prevent future releases. The article advises operators to proactively develop comprehensive PFAS management strategies, as PFAS presence in landfills is inevitable.
- The evolving regulatory landscape will likely demand more robust containment and treatment systems to prevent environmental releases of these “forever chemicals.”

Now, let’s outline and discuss potential impacts of the fall of Chevron deference and the evolving PFAS regulatory landscape.

While there is no one size fits all solution to dealing with PFAS contamination, there are several emerging technologies and guidance from EPA on how to evaluate them based on the organizational plan and specific needs.

What Does the Fall of the Chevron Doctrine Mean for New Regulations?

The U.S. Supreme Court's recent decision to overturn the "Chevron doctrine" will have significant implications for federal rule making, particularly for science-based agencies such as EPA, as this will inevitably impact the waste management and recycling industries. The Chevron doctrine, established in 1984, required courts to defer to federal agencies' interpretations of ambiguous statutes. However, the Supreme Court's June 2024 ruling in *Loper Bright Enterprises v. Raimondo* reversed this, mandating that courts independently assess whether agencies acted within their statutory authority.

This reversal may make it easier for opponents of federal regulations to challenge them when the authorizing law is ambiguous, Congress will no longer be able to leave it up to Agency discretion to interpret Congressional intent nor will the Agency serve as the primary advisor on specialized subject matter under its scope. Although the immediate impact on daily waste and recycling operations might be limited, long-term effects could introduce more legal complexities that are critical to understand at the corporate level.

Additionally, another Supreme Court decision, *Corner Post v. Board of Governors of the Federal Reserve System*, changed the timeline for challenging federal rules, allowing entities to do so when they are harmed rather than when the rule is issued. This could

lead to more challenges against EPA regulations, especially regarding the recent designation of certain PFAS as hazardous substances.

While some industry leaders believe these changes will not drastically affect current operations, the reversal of Chevron could influence future rulemaking, making agencies more cautious in their statutory interpretations. The decision may lead to increased legal challenges to new federal rules, particularly those related to environmental and labor regulations. In earnings call in August 2024, Clean Harbors co-CEO Eric Gerstenberg stated that the Chevron reversal (regarding PFAS cleanup) "is not going to have any effect on the regulatory environment for us ... The regulations today, those aren't going to be changed."

Moving Forward

So how does your organization move forward? Here is what we do know: there will be increased judicial review, more lawsuits and federal rulemaking may take longer. The regulatory environment surrounding PFAS is likely to be clearer at the state level. Organizations must stay informed about these changes and be prepared to adapt quickly. Organizations will need to quickly determine their overall compliance plan regarding PFAS. Both from a holistic corporate perspective and applicable to the localities in which they operate in.

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In the past, when there was uncertainty, investors have taken increasingly active roles in advocating for corporate responsibility, particularly concerning environmental, social, and governance (ESG) issues. Recent regulatory filings from several companies are directly addressing PFAS and the various ways organizations are planning to manage potential liabilities. It is likely that PFAS contamination will become a focal point for investors, much like sustainability efforts have been. Companies will need to strike a balance between meeting regulatory requirements and remaining attractive to investors. Demonstrating a strong commitment to managing PFAS risks and maintaining open communication with stakeholders can help companies maintain investor confidence.

While there is no one size fits all solution to dealing with PFAS contamination, there are several emerging technologies and clear guidance from EPA on how to evaluate them based on the organizational plan and specific needs. Organizations that lean in and proactively include PFAS in its overall environmental management plan will be well positioned to navigate the changing regulatory landscape. | **WA**

Sallee Murphy is the Vice President of Supply Chain and Contracts Management for Aclarity. She has been a Supply Chain Management and Contracts Administration professional for more than 10 years. During her career, she has worked in all aspects of the

supply chain from compliance to being an in-house subject matter expert on how environmental compliance can be included in buying practices. Her approach to contracting and supply chain management is to be a business partner providing guidance and risk mitigation in support of the organization's overall goals.

Leanne Hersey serves as Vice President of Marketing at Aclarity and has more than a decade of experience bringing disruptive B2B technologies to market. Leanne has successfully built the marketing function as a revenue generation center for fast growing startups in industries such as carbon nanotube manufacturing, industrial water treatment, and residential construction.

Aclarity's mission is to destroy PFAS forever and offers comprehensive PFAS management services to permanently destroy PFAS chemicals in liquid waste for industrial facilities globally. Their portfolio of cutting-edge technology enables organizations to better manage PFAS, protecting both the environment and public health. With a commitment to sustainability and innovation, Aclarity is a trusted partner for industries seeking effective and reliable PFAS solutions.

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Emerging Trends in Arc Flash Safety: Insights from the NFPA Conference

By embracing digital solutions and adhering to emerging standards like NFPA 70B, the industry can foster a safer working environment and uphold its commitment to protecting personnel from electrical hazards.

By Antonio Di Vaira



ARC FLASH INCIDENTS CONTINUE TO POSE SIGNIFICANT risks in commercial and industrial (C&I) buildings, despite advancements in safety protocols and technologies. This persistent threat stems from human factors such as complacency, insufficient training, and misunderstanding of safety standards, alongside equipment-related issues such as aging infrastructure lacking modern safety features and inadequate maintenance practices. These events contribute to injuries, equipment damage, and economic losses. Sometimes, arc flash incidents can even tragically lead to fatalities.

At the recent National Fire Protection Association (NFPA) Conference, experts highlighted several critical trends and challenges currently shaping the industry's approach to mitigating these hazards.

Understanding the Frequency and Severity

Recent research, including a comprehensive study by Johns Hopkins University, sheds light on the prevalence and impact of arc flash incidents in non-residential buildings. The study analyzed a decade of data, revealing that while the Bureau of Labor Statistics reported thousands of electrical incidents annually, only a fraction of them are officially categorized as arc flash events by safety agencies like OSHA. This underreporting underscores the need for better data collection and standardized reporting practices to accurately assess the true scope of the problem.

Data from various sources, including the Bureau of Labor Statistics (BLS), Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH), and Department of Energy (DOE) provide insights into these incidents, but lack a comprehensive, unified database specifically for arc flash events.

The BLS offers an overview of occupational electrical injuries, while OSHA and NIOSH provide more detailed investigation reports on a subset of incidents, covering a range of equipment and operational scenarios. However, challenges such as limited technical details and varied reporting standards across databases hinder a complete understanding and effective mitigation of arc flash risks.

Analysis of 1,291 investigation reports spanning from the early 1980s to 2022 revealed that arc flash incidents occur across a spectrum of voltage levels and equipment types, often involving common tools like screwdrivers. The reports highlight the diverse contexts in which incidents occur—from routine maintenance to unexpected operational activities—underscoring the complexity of mitigating arc flash risks. Improved data collection and standardization efforts are essential to address these challenges, promoting a

safer working environment through informed policy and procedural enhancements. Enhanced reporting granularity and metadata structuring could significantly aid in refining best practices and regulatory standards, ultimately advancing arc flash safety nationwide.

According to the Johns Hopkins study, an estimated 630 arc flash injuries occur annually in the U.S. This figure, derived from a meticulous extrapolation based on existing incident reports, underscores the urgency for improved safety measures and heightened awareness within the industry. Key findings underscore the need for enhanced safety protocols, including better PPE use and equipment de-energization practices, particularly during maintenance and installation tasks involving both qualified and unqualified workers.

Regulatory Developments: NFPA 70B

NFPA 70B, which traditionally offered recommended practices for electrical equipment maintenance, is gaining momentum as a mandatory standard across the industry. This shift marks a pivotal moment in electrical safety, moving from voluntary to obligatory compliance. However, challenges persist in widespread adoption, as highlighted in industry webinars discussing readiness and implementation hurdles.

NFPA 70B provides guidelines for electrical maintenance practices. Here are the eight recommended steps to help achieve compliance:

- *Establish an Electrical Preventive Maintenance (EPM) Program:* Develop a structured program that outlines the scope, objectives, and procedures for electrical maintenance.
- *Identify Critical Equipment:* Determine which electrical systems and components are critical to your operation and prioritize them for maintenance.
- *Develop Maintenance Procedures:* Create detailed procedures for inspecting, testing, and maintaining electrical equipment. These procedures should be based on manufacturer recommendations and industry standards.
- *Schedule Regular Inspections and Testing:* Implement a schedule for routine inspections and testing of electrical systems to identify potential issues before they escalate.
- *Train Personnel:* Ensure that personnel responsible for electrical maintenance are trained in safe work practices and procedures specific to the equipment they will be maintaining.
- *Maintain Detailed Records:* Keep accurate records of all maintenance activities, including inspections, tests, repairs, and re-



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placements. These records help demonstrate compliance and track equipment performance over time.

- **Monitor Changes in Standards and Regulations:** Stay informed about updates to NFPA 70B and other relevant standards to ensure continued compliance with industry best practices.
- **Review and Improve the Program:** Regularly evaluate the effectiveness of your EPM program through audits, feedback from maintenance personnel, and performance metrics. Make adjustments as necessary to improve safety and reliability.

Role of Digitalization in Compliance

Addressing these challenges requires a multifaceted approach, with digitalization emerging as a cornerstone strategy. Technologies such as digital twins, predictive maintenance, and advanced analytics are increasingly leveraged to enhance equipment reliability and streamline compliance with NFPA standards. These innovations not only optimize maintenance schedules, but also minimize downtime and operational disruptions, crucial for maintaining safety and productivity in C&I environments.

Recommendations for Enhanced Compliance

Industry leaders advocate for a systematic approach to achieve NFPA 70B compliance effectively:

- **Comprehensive Assessments:** Conduct thorough assessments of electrical equipment to identify potential risks and prioritize maintenance efforts.
- **Digital Tools Adoption:** Embrace predictive maintenance technologies and digital twins to monitor equipment health in real-time and preemptively address issues.
- **Training and Awareness:** Invest in continuous education and training programs to ensure personnel are proficient in safety protocols and compliance requirements.
- **Data-Driven Decision Making:** Use analytics to derive actionable insights from maintenance data, optimizing operational efficiencies and reducing risks associated with arc flash incidents.

A Critical Juncture

The NFPA conference highlighted a critical juncture in the industry's commitment to arc flash safety, emphasizing the need for proactive measures and technological innovations. Following these steps can help organizations maintain compliance with NFPA 70B standards and promote electrical safety and reliability in their facilities. As regulatory landscapes evolve and awareness grows, stakeholders are urged to collaborate, innovate, and prioritize safety to mitigate the impact of arc flash incidents effectively. By embracing digital solutions and adhering to emerging standards like NFPA 70B, the industry can foster a safer working environment and uphold its commitment to protecting personnel from electrical hazards. Through these concerted efforts, the path forward promises not only enhanced safety, but also increased operational resilience and sustainability in C&I buildings across the nation. | **WA**

Antonio Di Vaira is the Senior Vice President for Power Products over North America, Mexico, and Central America at Schneider Electric. In this role, he has full responsibility for all aspects of Schneider Electric's offer, and solution development, including strategy, R&D, market development, and go-to-market for the entire ANSI, NEMA, LV, and MV portfolio including Services. His relentless commitment to research and data has led to breakthrough innovations and fresh perspectives. Through his vast experience and diverse skill set, Antonio continues to apply his education and expertise across the global landscape of the industry showing his commitment to driving electrification and transformation in demanding market environments. For more information, visit www.se.com.

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So, You Think You Want to Be an Expert Witness— Some Lessons Learned

Experts are those persons who have special training, skill, education, or expertise beyond the experience of ordinary members of the public. Lawyers involved in environmental litigation use experts in a variety of ways and a new expert should understand what type of expert they are asked to be.

By Marc J. Rogoff, Ph.D.



YOUR PHONE RINGS OR YOU GET AN E-MAIL FROM A lawyer colleague who did some research on the Internet and found a recent article that you have published. He or she is wondering whether you might be a key to their recent legal case, either providing answers to research or serving as an expert in his or her legal proceeding.

I have worked for more than 40 years in the solid waste management industry and have provided my opinions on solid waste topics in more than five hundred consulting engagements in 48 states, three hundred publications in the trade press, and authored eight textbooks. Some consider me an expert on this subject.

However, like many environmental professionals, my knowledge base of the legal profession and civil trial procedure has been quite limited, fashioned on what I picked up in watching re-runs of Perry Mason, inhaling the series of John Grisham novels, catching up on Law and Order, watching trials played out before the American public, and what I was taught in my high school civics lessons. So, my experiences being engaged as an expert witness has been an educational one and I have learned that much of what I thought I knew about

how expert testimony works in a legal proceeding is quite different.

I have prepared this article to provide other experts who may be in the same situation with some information and lessons learned in the hope that it is helpful as they wade into the expert testimony waters. A few years ago, I authored an article for a statewide environmental organization, and now updated it based on my recent experiences as an expert. If you are already an accomplished expert witness, this article may be a refresher. However, if you are new to the expert witness arena, this article is for you.

A First Step

Recently, I received a telephone call from an attorney inquiring whether I might be interested in serving as an expert on a major lawsuit involving his client; I was intrigued. His client was aware of my lengthy career and reputation in the solid waste management industry, and I liked the idea of being considered and serving as an expert in such an important case. But, at the same time, I was concerned about the prospect of being cross-examined and picked apart on the stand during the trial like I have seen happen to witnesses so many times in popular media.

To make an informed decision about whether to accept this expert engagement, I interviewed my firm's legal counsel, talked to friends who had served as experts, and researched whether my firm, Geosyntec, had any potential conflicts of interest in my taking on this assignment. After confirming that there were no conflicts and receiving the advice from my support team, I decided to take the plunge and accept the expert engagement. As a first step, I sought information targeted at someone like me to provide a general overview of what I can expect to transpire and what my role would be during the upcoming civil



Tips for testifying:

1. Tell the truth and nothing but the truth. Careers and cases have ended when untruths are given in depositions or at trial.
2. Think before you answer. Take time to consider your answer. This will at least allow your attorney enough time to object to the question or line of questioning.
3. Answer the question asked. Even if you think the question is not relevant, do not follow-up with the question you think the examiner should have asked.
4. Do not volunteer information. Quite literally answer the question asked and then stop. It is not your role to educate the examiner. Once you have answered, remain quiet. The examiner will use the pregnant pause and stare at you to get you to further elaborate on your testimony.
5. Do not answer a question that you do not understand. If you do not understand the question, tell the examiner that you do not understand the question. Ask him/her to rephrase—it is not your job to ask the questions!
6. Do not guess. Be as specific as you can, but never guess. If you cannot recall, tell the examiner, that you cannot remember.

proceeding. Unfortunately, there is little, if anything, written for the non-lawyer on expert witnesses. The following sets forth the lessons learned, or if you will, a basic summary of the civil process and the role of the expert in such cases.

What Is an Expert Witness or Consultant?

In general, experts are those persons who have special training, skill, education, or expertise beyond the experience of ordinary members of the public. Lawyers involved in environmental litigation use experts in a variety of ways. For example, the expert or consultant may serve solely to evaluate the case and help determine whether the claim has merit. They may conduct onsite, or laboratory testing to prove or disprove a point or help build or defend the case. In other cases, the expert may serve solely as an expert witness at the trial. The major takeaway here is that experts are used in a variety of ways and that a new expert should understand what type of expert they are asked to be.

Discovery

American jurisprudence provides a formalized process for collecting relevant data and information during a legal proceeding. This process, typically described as “discovery”, is designed to provide the defendant and plaintiff with the same information so that they are working from the same factual basis. As an expert, there will be a formal process for how you get your information. You need to understand that process. In general, you need to keep track of all the information you review and provide references to all documents used as a basis for your opinions. Any documents that you generate during your engagement may need to be provided to the other side (subject to certain expert disclosure restrictions). Federal Rule of Civil Procedure 26 covers discovery and expert discovery; Cornell has a good excerpt here: www.law.cornell.edu/rules/frcp/rule_26.

Pleadings and Motions

Pleadings and motions are written by lawyers. Experts may be asked to provide consultation and/or support to certain aspects of these, which may be included as attachments. Often, it is helpful for

the expert to review these pleadings as they provide good background information—in some cases that has been stipulated by both sides. The plaintiff has the burden of proof in the lawsuit. Again, the expert can be helpful in developing the formal complaint or crafting the answers.

Expert Reports

Experts are used in litigation to help the judge or jury’s understanding of the facts of the case. In this way, they can first help to estab-

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lish and interpret the pertinent facts of the case by sifting through the often-voluminous amount of paper obtained during discovery. Calculations, articles, and memos used to develop the expert report as well as the report itself, must be made available to the opposing side. There are certain requirements on what must be included in expert reports—this can vary by area. In general, the expert must include all opinions and the basis for the opinions, including necessary references. A good technical editor can help immensely in preparing a concise expert report.

Daubert Standard

In 1993, the United States Supreme Court set a new standard for expert testimony in the case of *Daubert vs. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). This standard listed a non-exhaustive list of factors, including general acceptance in the scientific community, that the courts may consider when they decide whether to admit expert testimony. These include five basic factor to consider:

1. Whether the expert's technique or theory can be tested and assessed for reliability
2. Whether the technique or theory has been subject to peer review and publication
3. The known or potential rate of error of the technique or theory
4. The existence and maintenance of standards and controls
5. Whether the technique or theory has been generally accepted in the scientific community

The intent of the court was to provide basic factors for judges to consider in the Federal courts, although many states have enacted bills to adopt the Daubert standard in state trials as well.

Depositions

The “deposition” is a direct way to gather evidence for trial from anyone with any relevant knowledge of the case, including the experts hired by either party. Witnesses are sworn to tell the truth by a court reporter and a transcript is prepared. Questioning is designed to probe the expert's biases, potential weaknesses, and to accelerate the expert's learning curve on facts surrounding the case or the industry in general.

Tip for Testifying sidebar, page 63, contains some useful tips for experts. Be prepared. Prepare for a long day—rest and eat. Remember to speak clearly and verbally (no hand signals). Make sure you understand the question and then only answer that question. Pause after each question is asked to allow counsel on your side to object if needed. Spell out complicated words and define acronyms for the reporter. Avoid verbal tics (ums, uhs, likes)—instead, pause.

The Trial

At trial, the expert witness will be used in direct examination to lay out the facts of the case and the story in terms a lay person can understand. The role of the expert is to unravel the mysteries of the case in terms of their special expertise. Know the trial exhibits that your counsel plans to use to guide your testimony. Be ready for clarifying questions from the judge and address them respectfully and directly.

Settlement

Prior to and during the trial there is always a possibility that the parties can negotiate an amicable settlement. In this case, they would jointly inform the presiding judge that the case has been settled. Therefore, from an expert's perspective, all papers used in preparation of the case must be preserved until the case is settled.

A Personal Side

A Federal case for which I served as an expert witness for three years involved claims of tens of millions of dollars. Both parties had invested millions of dollars in researching their complaint and defense as the case weaved its way through the Federal district court system. Experts on both sides provided focus for the case and eventually provided a mechanism by which both sides evaluated the merits of their case and preparation prior to trial. This eventually translated into a decision to settle the case before opening statements were made to the jury.

Having never served as an expert witness before this case, I was a little anxious about testifying in court. And yes, I was happy when the case was settled! However, the training and advice given to me by the defendant's counsel during my engagement gave me invaluable insight and experience for future situations. I expect that my expert report was helpful in narrowing the gulf between the two sides and supporting the progress toward a settlement, resolving the dispute, and freeing up valuable court time.

Best of luck to all of you new expert witnesses. I hope my sharing of this experience and information helps you successfully navigate the process. |WA

Marc J. Rogoff, Ph.D. is a Senior Consultant with Geosyntec Consultants. He has served as an “expert” on a variety of cases both in state and federal courts in matters involving landfills, transfer stations, personal accidents, fatalities, industry standards of care, and applicable standards. These efforts have assisted clients in winning their cases by providing research, reports, depositions, and testimony. Marc can be reached at (813) 810-5547 or e-mail mrogoff@geosyntec.com.

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The Can Advantage: The Cross-Benefits of Boosting Metal Packaging Collection

Whether through infrastructure improvements and legislative support or consumer activation and greater understanding of recyclable materials, strengthening the U.S. recycling system requires an underlying sense of responsibility from the entire value chain.

By Jennifer Bogs and Vikas Chandola



Crown's Conroe, Texas beverage can plant, through more than 300 volunteer hours as the official recycling partner of the local Montgomery County Fair and Rodeo, managed to collect nearly 60,000 beverage cans from event attendees. The initiative worked to build awareness around the importance of recycling and to teach the next generation to be advocates for the cause.

Photo courtesy of Crown.

CAN MANUFACTURERS AND WASTE PROFESSIONALS, while seemingly at opposite ends of the value chain, have more in common than one might think. The biggest connection: Both maintain an obligation to minimize landfill contributions and foster a more circular economy. In the U.S., striking this balance remains challenging, given factors like an ongoing lack of infrastructure for recycling systems and a gap in consumer education and commitment to recycling. In fact, according to the U.S. EPA's last report in 2018, more than 50 percent of municipal solid waste (MSW) was sent to landfill that year, and only 32 percent of MSW was recycled. Yet, a more positive outlook for recycling is possible, due to unique advantages found through recycling cans. By understanding substrate nuances and using the material to strengthen waste streams, as well as creating greater awareness of the impact of can recycling, the waste collection industry can make realistic progress toward a more sustainable future.

Focusing on the Right Materials

Waste professionals, while tasked with managing a wide range of materials, know that not all packaging is created equally. Some consumer-packaged goods waste is truly debris and has a set path to landfill, while some is salvageable for reuse or recycling. Aluminum and steel cans take the definition of "recyclable" to a higher standard, representing a substrate that is inherently circular and can be recycled infinitely with zero loss in durability or quality.

This level of circularity offers several sustainability benefits to the waste collection industry and beyond. For one, properly recycling metal cans and using that recycled material to produce new goods saves more than 90 percent of the energy required in production using virgin materials. That entire can-to-can process can happen within just 60 days—making the concept of recycling very tangible and impactful. Additionally, effectively recycling metal packaging saves

precious materials from going to landfill unnecessarily and causing further strain on the planet's natural resources. All of this results in less energy consumption, reducing carbon emissions, and fostering greater climate action.

On an economic front, recycling metal packaging yields equally critical value. Aluminum and steel are two of the highest-valued substrates in the recycling stream, due to their circularity and strength. According to the Can Manufacturers Institute (CMI), aluminum beverage cans in non-deposit states account in a typical material recovery facility (MRF) for 33 percent of the revenue, more than any other single material commodity. Without the revenue from UBCs, most MRFs would not be able to operate, meaning the larger recycling system is heavily dependent on metals to remain functional. This demonstrates how imperative it is for the waste collection industry to focus on metal packaging and work diligently to recapture as much of it as possible.

By creating extra system support for substrates like metal that serve as such low-hanging, valuable fruit, the industry can better fund overall collection and improve overall recycling rates.

Investing in Communities

Despite the economic and environmental value of aluminum and steel cans, only a respective 45 percent and 58 percent are currently

recycled each year in the U.S. While still at a higher percentage than some substrates, this number has the potential to skyrocket with the right strategies and support—and it is crucial that it does rise to create a stronger closed loop that minimizes material waste and energy consumption. When it comes to beverage cans in particular, CMI's research shows that if all used cans were recycled, that would result in another \$940 million of economic value in the U.S.—underscoring the importance of improving consumer compliance and system effectiveness.

To contribute to increased recycling rates for metal packaging, the waste collection industry can prioritize efforts in two core areas.

#1: Building Greater Infrastructure

Recycling systems remain inconsistent in states across the nation in terms of sorting capacity and legislative backing. The can manufacturing industry is leveraging a couple of tactics to increase attention toward and effectiveness for these systems, including:

- Advocating for stronger recycling policies at the city or state level, such as a deposit return scheme (DRS), in which consumers are incentivized to return their used beverage packaging; and extended producer responsibility (EPR), which places more accountability with consumer-packaged goods companies and their suppliers to monitor their products throughout their complete life cycles and strive to

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minimize the impact of that life cycle. Other influential policies may involve incentives or requirements for manufacturers to use recycled content in their products, and limits on the use of non-recyclable, minimally recyclable, or difficult-to-recycle materials.

- Finding opportunities for more effective sorting equipment, with the goal of increased can capture rates that save more cans from mistakenly going to landfill. Industry actions currently in play include investments in robotics and other technologies that more accurately differentiate between substrates and prioritize valuable metal packaging at MRFs. Additionally, communities can strengthen their infrastructure by making collection points like curbside recycling more accessible, as well as working with legislators to create more viable pathways between MRFs and manufacturing suppliers seeking recycled material.

#2: Driving Awareness and Accountability with Consumers

For recycling rates for metal cans and all substrates to improve, the entire consumer-packaged goods value chain must understand that consumer engagement and education are essential. For consumers to commit to recycling, they need brands, retailers, waste collectors and government bodies all demonstrating what goods are recyclable, how to properly recycle them, and why it all matters. They also need recy-

cling to be accessible (speaking again to infrastructure) where they are in their communities. A few ways the manufacturing industry and waste collection industry can continue to encourage consumer action include:

- Ingraining positive recycling habits in younger generations and families. One effective example of how to target this demographic is to create interactive recycling challenges at academic institutions or at community venues such as sports games, concerts, or parks, through which consumers can learn about different substrates and practice good habits.
- Correcting misconceptions about recycling with all demographics, including investing in community-distributed materials that show the impact of recycling and the role that each individual has in creating an effective system.
- Using the connections and reach of industry associations to help create more of a nationwide narrative around current waste collection industry goals for recycling and the ways consumers can be a part of the solution.

The Value Chain

Ultimately, whether through infrastructure improvements and legislative support or consumer activation and greater understanding of recyclable materials, strengthening the U.S. recycling system requires an underlying sense of responsibility from the entire value chain. Manufacturers, brands, retailers, consumers, waste collectors, and legislators—all have to work in tandem to drive progress toward higher recycling rates. By starting with collaboration around aluminum and steel cans, that progress falls within reach. | **WA**

Jennifer Bogs is a global director of sustainability at Crown, overseeing the strategy and implementation of the Company's sustainability program at approximately 400 locations in 40 countries while leading a global team of sustainability professionals. Working alongside the global executive team, Jennifer is client-facing with some of the world's largest household-name brands. She has experience working in the food and beverage industry, packaging, and in the steel industry, with 20+ years' experience in the environmental field and 9+ years of experience in sustainability. Jennifer holds a law degree as well as an M.B.A.

Vikas Chandola serves as a manager of sustainability for Crown, using his extensive expertise as a certified Life Cycle Assessment Certified Professional (LCACP) from the American Center for Life Cycle Assessment to support the Company with LCAs and other reporting initiatives. He holds a Bachelor of Technology in Chemical Engineering from the Indian Institute of Technology, an MBA from the Indian Institute of Management, and also a Master of Liberal Arts in Sustainability from Harvard University's Extension School, the last of which he teaches LCA coursework in his spare time.

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How Transportation Fleets Have Evolved to Embrace Digital Contracts

From origination transactions to back-office operations, digital transformation can revolutionize how fleets operate and collaborate.

By Matt de Aguiar



ALMOST IMMEDIATELY FOLLOWING THE ONSET OF THE pandemic, many organizations, including transportation fleets, rushed to digitize their operations to reduce the handling of paper-based contracts and documents. Today, organizations are increasingly digitizing for a number of business benefits unrelated to the pandemic, which has resulted in significant efficiencies for transportation fleets and their financing partners.

Contracts are the lifeblood of relationships between lenders, partners, and customers, such as organizations with heavy-duty transportation fleets. Technology has enabled the modernization of company processes, and this has resulted in reducing their reliance on paper contracts. This shift not only improves the speed and efficiency of transactions, but also ensures greater security and compliance with stringent regulations for equipment financing.

The transition to digital contracts also addresses concerns related to document storage and access control. Digitization enables better protection of documents during transfers between the transportation fleets and their finance partners, as an example. Recognizing the inefficiencies in paper-based processes, transportation fleets and their finance partners are actively seeking to minimize their reliance on physical paperwork. This shift is particularly seen in many industries that operate private fleets, such as construction. As an example of this, in terms of how companies have contracted partnerships with transportation fleets, about 7.5 percent of all documents end up getting lost, which is a significant reason why keeping everything digital today is extremely effective.¹

Delivering More Accuracy and Efficiency

To be clear, paper is still used throughout the industry, but through digital transformation, companies are realizing a more effective alternative in solving several key pain points for the industry. First and foremost, digitization will significantly improve the accuracy and added costs to manage paper, keeping up with revisions, etc. Digital contracts not only reduce the risk of using outdated agreements, but also facilitate smoother interactions between the lender and the truck dealer or business.

Today's transportation fleets and their finance partners recognize the importance of digitization, and they have seen significant enhancements including faster processing, streamlined workflows and a more reliable, trusted document handling system. Managers like the ease of logging in, reviewing, and signing their documents, which automatically pushes the document to the next approver.

What's more, aside from e-signatures and digital contracting, the electronic storage of these contracts is crucial for all parties involved, ensuring secure access and facilitating audits.

Digital contracting will only grow in prominence, so equipment financiers should recognize this if they want to be considered leaders of tomorrow. According to industry data, the global digital signature market size is projected to grow from \$7.4 billion in 2023 to \$34.8 billion by 2028—a CAGR of 36 percent during that time.² Leading companies in their respective industries will quickly turn toward digitizing their contracts and signatures.

The next phase of contracting digital transformation will involve leveraging advanced workflow processes such as e-contracting, multi-channel origination, digital certainty, auditing, document governance, security, post-transaction asset management, and analysis tasks. Each of these areas may seem mundane to the average person, but they each remain critical for the industry to evolve to the next chapter of digitalization.

Centralized data management will allow transportation fleets and their finance professionals to access and analyze metadata across various origination channels and asset classes. It will also help to control and track access, manage status changes, and transfer control of digital documents while using sophisticated granular controls and permissions to allow for departmental separation and visibility. All of this will result in improved speed and process efficiency for the entire industry.

Time to Advance Your Operations

Despite the numerous benefits of digital transformation, some organizations have been slow to adopt these changes. Challenges, such as legacy internal processes, user resistance, and concerns about software costs have hindered progress for some. However, delaying this adoption of digital solutions will result in a significant competitive disadvantage.

With these enhancements, the equipment finance and transportation fleet industries can advance in digital transformation. From origination transactions to back-office operations, digital transformation can revolutionize how original equipment manufacturers (OEMs), dealers, equipment financiers, and the fleets themselves operate and collaborate. | **WA**

***Matt de Aguiar** is the Chief Operating Officer at Fleet Advantage, a leading innovator in truck fleet business analytics, equipment financing and lifecycle cost management. For more information, visit www.FleetAdvantage.com.*

Notes

1. www.itbriefcase.net/adoption-and-trends-of-digital-signatures-in-the-construction-industry
2. www.marketsandmarkets.com/Market-Reports/digital-signature-market-177504698.html



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- Motivating and thought-provoking keynotes on topics such as impacts of climate change on the industry, building a culture of safety, and the future of extended producer responsibility.
- Technical sessions on timely topics, including: landfill regulatory compliance, PFAS management, fire prevention, food waste management, policies to support recycling, disaster debris management, planning for rate increases, and much more!
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 2. Plastic Roads: Paving the Way to Sustainability Innovation in Action: Republic Services Plano Recycling Center
 3. Power and Precision: Inside the Peterbilt Factory
- A brand-new course: Essential Leachate PFAS Treatment and Management Training for Landfill Professionals.
- |An exhibit hall that encourages conversations and connections with suppliers and other executives, including in-booth educational opportunities, and demonstrations delivered by sponsoring solution providers.
- |Networking time to make connections with strategic partners and colleagues in the industry.



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Behind the scenes: VIP Tour of Dallas Cowboys AT&T Stadium

Experience the ultimate VIP tour of the iconic AT&T Stadium, home of the Dallas Cowboys. Explore exclusive areas such as the Cotton Bowl Hall of Fame, Post Game Interview Room, and the Dallas Cowboys and Cheerleaders Locker Rooms. Meet the Head of Sanitation and learn about the stadium's waste management practices, including a visit to the trash compactor room. Get an insider's view of how this world-class venue handles sustainability and operations.

Innovation in Action: Republic Services Plano Recycling Center

Discover the future of recycling at the Republic Services Plano Recycling Center. This award-winning facility processes up to 250,000 tons of material annually with cutting-edge sorting technologies, including advanced optical sorters. Visit the expansive Learning Center, featuring interactive displays and a live stream of recycling operations. Get a behind-the-scenes view from the observation deck and learn how this facility is transforming sustainability efforts in the Dallas-Fort Worth market.



Photos courtesy of SWANA.

Plastic Roads: Paving the Way to Sustainability

Join us on a journey to the forefront of sustainable infrastructure with the Plastic Road project at the University of Texas at Arlington. Witness how recycled plastic is revolutionizing road construction, enhancing durability, and reducing environmental pollution. Visit the plastic road-testing facility and observe sections of the innovative plastic road that have withstood extreme conditions. Learn how this project is addressing climate change and promoting a circular economy.

Power and Precision: Inside the Peterbilt Factory

Step into the world of top-tier truck manufacturing at the Peterbilt Motors plant in Denton, TX. Experience the PACCAR Production System, which ensures every truck is built to the highest standards. Explore eco-friendly technologies and green initiatives that reduce environmental impact. See firsthand why Peterbilt trucks are renowned for their durability and quality, earning the title “Best in Class.”

New SWANA Course: Essential Leachate PFAS Treatment and Management Training for Landfill Professionals

Increasingly, landfills can play a critical societal role in the management of PFAS wastes and concentrates and have a large capacity to sequester and store PFAS waste. This new course provides landfill personnel with the terminology and understanding necessary to engage with regulators, engineers, and vendors about leachate management and treatment options and requirements.

Attendees will learn about the drivers and consequences of the ever-changing PFAS regulatory landscape and how new and future regulations could impact their choices of management approaches and technologies selection. Landfill managers need to understand the management options and opportunities available to address the PFAS issue. This course provides the information and education needed to understand and evaluate the benefits, costs, and commer-

cialization status of the numerous treatment technologies and systems that are available to treat leachate for PFAS removal on site.

Experiencing Grapevine

Grapevine offers Texas-sized fun in a small, welcoming community with an authentic, relaxed atmosphere. Enjoy a charming, walkable Main Street, lake activities, and year-round festivals and events, all within a 3-mile radius. Host city to DFW Airport, Grapevine is the ideal home base for exploring all the Dallas-Fort Worth Metroplex has to offer. But with so much to do in Grapevine, you might not want to leave. Be sure to enjoy offers through Grapevine’s “Show Your Badge” program! Visit the Grapevine Vintage Texas Website to view special offers presented by local Grapevine businesses. Show your WASTECON® badge at any of these businesses and save!

WASTECON® offers the ideal forum for leaders and practitioners to converge, collaborate, and innovate for a sustainable future! | **WA**

This event is hosted by SWANA, the leading professional association in solid waste management. The association’s 10,000+ members are professionals committed to advancing from solid waste management to resource management through their shared emphasis on education, advocacy, and research. For more information and to register visit WASTECON.org.



Capturing Valuable Materials Through Effective Waste Diversion

How King County, WA is leveraging Juno® to achieve zero waste goals.

By Christer Henriksson

IN 2019, KING COUNTY, WA, PUBLISHED A WASTE Characterization study that revealed, despite its well-established curbside recycling programs, nearly 70 percent of waste—more than 600,000 tons—was still ending up in municipal landfills. The Cedar Hills Landfill, approaching its land-bearing capacity with a projected closure date of 2040, prompted King County to transition away from a linear “throwaway economy” and divert more waste.

Waste Reduction

In 2023, King County launched Re+, an initiative aimed at cutting landfill waste by 70 percent by 2030, through the reduction of single-use items, improving recycling programs and renewing commu-

nity engagement. A key component of this strategy is to understand and assess new technologies that can better capture and divert valuable, recyclable materials. Enter Juno® Technology, a breakthrough waste recovery technology capable of diverting up to 90 percent of the materials it processes away from landfills and incinerators. Developed by pulp and paper industry leader Georgia-Pacific, the first Juno facility is just five hours south of King County.

In early 2023, King County partnered with Juno to pilot their mixed waste processing facility and test how much of the recyclable material sent to landfills could be recovered. Juno® Technology uses a patented wet-separation process to sanitize and separate municipal solid waste (MSW), recovering valuable materials that



Juno began processing waste from Seattle's King County, the 12th largest county in the U.S., as the municipality explored opportunities to divert waste from landfills.



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After visual inspection for non-conforming items, waste is sent to a rough shredder, baled, and fed into the Juno™ Clave via conveyor belt.

standard recycling methods frequently overlook. The technology captures previously unrecoverable paper fibers in the waste stream, such as those from coated cups and contaminated packaging, while also capturing valuable recyclable metals and plastics that could be repurposed into new products.

Sorting and Processing

During the 10-week trial, King County sent about 740 tons of MSW from the Renton Recycling and Transfer Station to the Juno facility in Toledo, OR. After the material was shredded, baled, wrapped, and delivered to the Juno facility, the material underwent a heat and pressure treatment process to sanitize the waste. The sanitized materials were then sorted and recovered paper fiber was processed and removed to later be made into recycled paper products such as corrugated boxes. Sand and grit that could be used as aggregate, were filtered out, while ferrous metals, such as steel and cast iron, were extracted by industrial magnets to make new metal products. Non-ferrous metals, such as aluminum and copper, were also recovered.

Of the 737 tons processed at the Juno facility, Juno achieved diversion range of 38 percent to 58.2 percent, depending on the compilation of the load, with 342 tons diverted and recovered, including 18 percent paper fiber, 3 percent metals and 25 percent water/organics (food, wood, textiles and leather). About 395 tons (54 percent) of residuals was sent to Cedar Hills Regional Landfill, meaning nearly half of the waste processed was diverted into new material through Juno® Technology alone.

Higher Recovery Rates

The trial also revealed potential areas for growth among local governments and municipal customers. A considerable amount of construction and demolition materials were discovered, which are crucial to separate from waste processing. Construction and demolition materials were removed by Juno staff and added to the residual pile for the landfill, which likely impacted the potential for higher recovery rates in the trial's data.

As the cost of waste volumes, permits, and operating facilities continue to rise, regulations governing waste management are becoming more complex. As a result, local governments and municipi-



Waste is sent through the Juno™ Clave that uses steam, pressure, and heat to sanitize it.



After exiting the Juno Clave, the material goes into a wet separation unit that uses Georgia-Pacific's extensive knowledge of paper fiber cleaning to separate the paper fibers from the rest of the waste. This is what sets Juno apart from other waste and recovery technologies. Photos courtesy of Juno.

palties are seeking ways to reduce the amount of waste requiring disposal. These strategies aim to reclaim valuable materials from waste streams rather than pay to dispose of them. By increasing recycling and composting efforts, municipalities can reduce their waste disposal costs, recover valuable resources, and meet regulatory requirements.

The outcomes of the trial demonstrate how Juno's technology optimizes the sorting and separation of materials, leading to more effective waste diversion. When waste is diverted and properly managed, less waste ends up in landfills and incinerators, which has many environmental benefits including reducing harmful emissions and lowering the risk of contaminating groundwater.

The facility currently has an annual capacity of 60,000 to 70,000 tons, while operating on a schedule of four-days per week. Looking ahead, future Juno facilities will be capable of processing 330,000 tons of MSW per year using additional sorting equipment, increasing diversion rates up to 90 percent.

Looking to the Future

As King County looks to the future of waste management, the results from the Juno pilot underscore both the benefit and necessity of reducing landfill waste through increasing material recovery and diversion.

“We are really excited about the diversion potential of mixed waste processing technologies like Juno,” said Pat D. McLaughlin, King County's Solid Waste Division Director. “Mixed waste processing, alongside other waste reduction, prevention, and recycling initiatives, has the potential to be an important piece of our long-term plans to reduce the amount of garbage going to the landfill, and lower our carbon footprint here in King County.”

Georgia-Pacific opened its initial pilot plant in Savannah, GA, in 2013, and its first commercial facility in Toledo, OR, in May 2021, where it continues to process local waste today. In its first year of operation, the Juno facility nearly tripled landfill diversion rates in Toledo, OR and expects to expand its footprint with facilities around the globe. | **WA**

Christer Henriksson is President of Juno, a Georgia-Pacific owned company. Prior to leading the Juno team, he spent 12 years modernizing Georgia-Pacific's recycling operations and leading the development of innovative recycling technologies. Before joining Georgia-Pacific, Christer served as SVP and COO of American Fiber Resources International, a multi-recycled-pulp mill entity. Christer can be reached at chenriks@gapac.com.

Resource

- <https://kingcounty.gov/en/dept/dnrp/waste-services/garbage-recycling-compost/solid-waste-programs/re-plus>

BREAKTHROUGHS AND INNOVATIONS

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Air Burners®, a leading manufacturer of air curtain burner systems worldwide, developed revolutionary technology that tackles the root of the problem by permanently eliminating woody and vegetative debris, all while taking care of the environment and your bottom line. The BioCharger is the first machine of its kind, combining three innovative steps to provide off-grid power from vegetative waste management.

Harnessing the power of nature, Air Burners used its more than 25 years of industry experience to develop the BioCharger, which transforms vegetative waste into clean, renewable energy with unparalleled efficiency and minimal environmental impact. Eliminating waste at an accelerated rate—up to 10 tons of clean wood and vegetative waste per hour—the BioCharger stores energy in the Battery Storage Module to power your electric vehicles onsite, helping you save time, money, and the planet.

The BioCharger is fully automated and offers Internet connectivity through remote access, enabling the Air Burners team to be in constant contact with your machine should you experience any technical issues. Should an issue arise, the Air Burners team will receive an alert and will follow up to troubleshoot and apply the fix remotely.

Operating the BioCharger is straightforward: Press the green start button to initiate all internal checks and prompt the machine to seek heat from the FireBox Module. If the system detects heat, the generator will start, and energy will be delivered to the Battery Storage Model (BSM). At any point during operation when heat is not present from the FireBox Module, the system will go into Standby Mode until it senses heat. Simply press the red stop button and send the system into shut down mode, where it sits ready for another day. The BSM can be used at any time, but typically, energy is stored throughout the day to recharge battery-powered machines overnight, providing “free” energy for the next day’s work. The BioCharger closes the energy loop, enabling off-grid operation and the charging of vehicles, equipment, and power tools.

For more information, call (855) 802-6639 or visit <https://airburners.com>.



Diversys, a leading provider of innovative SaaS solutions for waste management, has officially launched its state-of-the-art platform designed to address the critical pain points faced by waste management stewardships. With a mission of “Powering A World Without Waste,” Diversys is set to revolutionize the industry by offering unparalleled efficiency, compliance, and sustainability.

Waste management organizations face a mix of challenges, from stringent regulatory requirements and operational inefficiencies to the complexities of data management and the pressing need for sustainable practices. Diversys’ SaaS solution is designed to meet these challenges head-on, providing a user-friendly platform that integrates seamlessly into existing operations. Diversys offers a suite of features that cater to the diverse needs of the waste management sector:

- **Regulatory Compliance:** Simplifies adherence to federal and provincial waste management regulations, ensuring timely and accurate reporting.
- **Operational Efficiency:** Enhances the efficiency of resource recovery, sorting, and disposal processes, reducing operational costs.
- **Data Management:** Delivers powerful data analytics and reporting tools, enabling better decision-making and performance tracking.
- **Sustainability:** Supports organizations in achieving their sustainability targets by optimizing waste

reduction and recycling efforts.

- **Stakeholder Collaboration:** Facilitates effective communication and collaboration among government agencies, waste management companies, in-field participants such as collectors, haulers, processors and remanufacturers, and other stakeholders.

- **Future Proofing:** Diversys helps to prepare organizations for the future of waste and resource management, leveraging best-practices from stewardships.

For more information, visit www.diversys.com.

ARI-HETRA highlights its cutting-edge BPW Wireless Mobile Column Lifts. Designed to advance efficiency and safeguard operations, these industry-leading lifts maximize performance for service techs across numerous industries.

The BPW Wireless Mobile Column Lifts deliver unparalleled versatility and practicality, cementing their role as essential shop equipment. They are powered by a low friction recirculating ball-screw mechanism allowing for precise control and ultimate efficiency. A longer battery life promises the highest number of lifting cycles in the industry. Technicians can easily move and reposition each wireless mobile column lift, increasing turn-around time and productivity. Their wireless mobile column lifts can be hooked up in sets of up to 8 with a maximum capacity of 144,000 lbs. Key features include:

- Made In the USA - Alabama.
- Each wireless lift supports up to 18,000 lbs.; a set of 8 bears up to 144,000 lbs.
- No wiring needed, which declutters work areas and reduces risks.
- Recirculating ball-screw mechanism requires little maintenance, is lightweight, and does not leak like hydraulic systems may.
- Intuitive Interface: User-friendly controls with precise lift positioning.
- Safety: Self-balancing and automatic shut-off add protective measures.
- Versatility: Optimal for an assortment of medium and heavy-duty vehicles.

In addition to their impressive technical specifications, the BPW Wireless Mobile Column Lifts are designed with the user in mind. The intuitive interface and robust construction ensure that operators can perform maintenance tasks efficiently and safely, reducing downtime and increasing productivity.

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BREAKTHROUGHS AND INNOVATIONS

The new Galaxy Giraffe ND Severe Duty Service (SDS) tire from **Yokohama-ATG** brings three-stage solid construction to telehandlers operating in a wide range of environments, from loose soil to heavy debris and indoor surfaces. The three layers of specially engineered compounds minimize heat build-up and vibration while maximizing stability and ride comfort. The puncture-proof solid construction of the Giraffe ND SDS also features a non-directional block pattern that optimizes the balance between ride quality and comfort on pavement with forward-and-reverse traction and self-cleaning on loose surfaces.

“The three-stage construction of the Galaxy Giraffe ND SDS solid combines our durable tread compound that extends up the sidewall for extra damage protection, a rugged base compound for tight grip on the rim, and between them, a cushion core that reduces heat build-up and provides operator comfort without apertures,” says Bhavesh Sondagar, Yokohama Off-Highway Tires America, Inc., Product Manager for Earthmoving, Construction and Industrial Tires. “In many solid tires carrying heavy loads, cracking around the apertures is a common point of failure,” he explains. “The special cushion core in the Galaxy Giraffe ND SDS allows us to provide a comfortable and stable ride without the need for apertures.”

The new 360/85-28 Galaxy Giraffe ND provides a stable, long-lasting option for heavy-duty operations with high load-carrying capacity. The same dense tread pattern, wide footprint and solid construction that minimize vibration also make the Galaxy Giraffe ND SDS significantly more stable—and give operators more confidence—than R-4 telehandler tires. They also lengthen service life. “The Galaxy Giraffe ND SDS also has 20 percent more wearable rubber above the 60J line and better wear and heat resistance than the top competitor,” Bhavesh adds. “Those benefits combine to deliver significantly longer tire life.”

“With its big, wide, even footprint and non-directional tread, the Giraffe ND solid is an ultra-stable, top performing tire that extends the working possibilities of telehandlers through its durability, traction, and extremely high load carrying capacity due to its 28-inch rim,” Bhavesh concludes. “This tire makes telehandlers an even more versatile tool for work outdoors and indoors, from rough construction and materials handling, scrapyards, waste/recycling facilities, and demolition sites to arenas, stadiums, and commercial structures with sensitive flooring.”

Yokohama Off-Highway Tires America, Inc., has launched the new Galaxy Giraffe ND SDS solid in the 360/85-28 size. A 315/95-28 will be available later this year.

For more information, visit www.yokohama-oh.com



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BREAKTHROUGHS AND INNOVATIONS

TOMRA's new cutting-edge deep learning solution enables MRFs to maximize recovery and purity of aluminum from metal packaging waste streams. GAINnext™ leverages sophisticated AI to instantly detect and eject non-UBC materials like aluminum bottles, food cans, trays, UBC metals or plastics, and more, for high-accuracy, automated sorting of aluminum cans. The new solution features automated sorting at high belt speeds to significantly improve operational efficiency with up to 33 times more throughput than manual sorting.

Developed as an end-of-line solution for MRFs, GAINnext™ quickly integrates into existing lines to lower overall costs and improve return on investment (ROI). GAINnext™ uses an RGB camera, trained by thousands of images, to recognize UBC based on shape, size, dimension, and more. Its high-throughput processing delivers up to 2,000 ejections per minute, and the deep learning software identifies overlapping objects and calculates positioning for high-precision, above 98% purity sorting. Offering exceptional purity levels, the GAINnext™ UBC application gives the market an automated process for aluminum can-to-can recycling.

Field proven for years, TOMRA was the first to introduce deep learning AI technology in 2019 with its application to identify and remove polyethylene (PE) silicone cartridges from PE streams. A game-changing second deep learning application focused on wood chip classification, sorting solid wood from wood-based materials like chipboard, plywood, and MDF into individual fractions.

Earlier this year, TOMRA announced five new plastics and paper deep learning sorting applications using GAINnext™ initially for the European market. Three revolutionary applications efficiently separate food-grade from non-food-grade PET, PP, and HDPE at high throughput rates with purity levels reaching 95%. Two non-food applications for the GAINnext™ ecosystem include a PET cleaner application delivering even higher purity PET bottle streams and an application for deinking paper for cleaner paper streams. The new UBC application is TOMRA's region-specific GAINnext™ sorting application initially targeting the needs of recyclers in the Americas.

For more information, visit www.tomra.com.



Two significant factors determine the success of a demolition project: safety and cost-saving solutions. **SENNEBOGEN** engineering has continued to respond to the market's needs. With these new features on their proven demolition machine, the 830 R-HDD continues to enhance its onsite flexibility. Demolition work often takes place in urban areas characterized by confined spaces and limited working areas for machines. The additional reach on this platform has increased the flexibility of the jobs that can be undertaken while also enhancing safety. The 830 R-HDD has proven itself to be the ideal machine for work in cramped, inner-city locations. Its environmentally friendly engine, compact dimensions, flexibility in operations, and attachment selection capability make it the go-to machine for these demolition jobs.

In addition to the standard safety features already built into the unit, such as bulletproof windshields, skylights, and rear-view and right-side camera systems, this machine has an exceptionally wide working mode stance of 14'9", ensuring optimal stability and a vibration-free working environment, even when dismantling structures at maximum height. The hydraulically elevating Maxcab, with up to a 30° tilt, allows operators to maintain a comfortable working position while keeping a safe distance from the danger zone. The powerful high-flow hydraulics mean that a wide variety of attachments can be used, including shears, grabs, hammers, and pulverizers. These attachments can be quickly changed on-site, thanks to a fully hydraulic quick-coupler system.

The new long front equipment provides additional reach. The AB23 three-part system not only increases the distance from the site but also enhances the machine's utilization. With the help of a fully hydraulic quick-change system, equipment can be picked up or put down at the push of a button quickly and safely and even switched to shorter handling equipment without the operator having to leave the cab. Furthermore, with the 75' (23 m) reach, the 830 R-HDD can master new heights, increasing jobsite safety. It can work over projecting edges with its articulating boom. Thanks to the removable counterweight, the SENNEBOGEN 830 R-HDD can be transported on a lowboy trailer

from site to site quickly and more cost-effectively in up to three sections. A button on the remote control reduces the transport weight of the 830 by approximately 20,000 lbs. using a hydraulic ballast rack. Additionally, for transportation, the telescopic undercarriage can be reduced to 9'7", while the three-part demolition arm is taken to the next site in a transport frame in a simple, cost-saving, and efficient manner.

For more information, visit www.sennebogen-na.com



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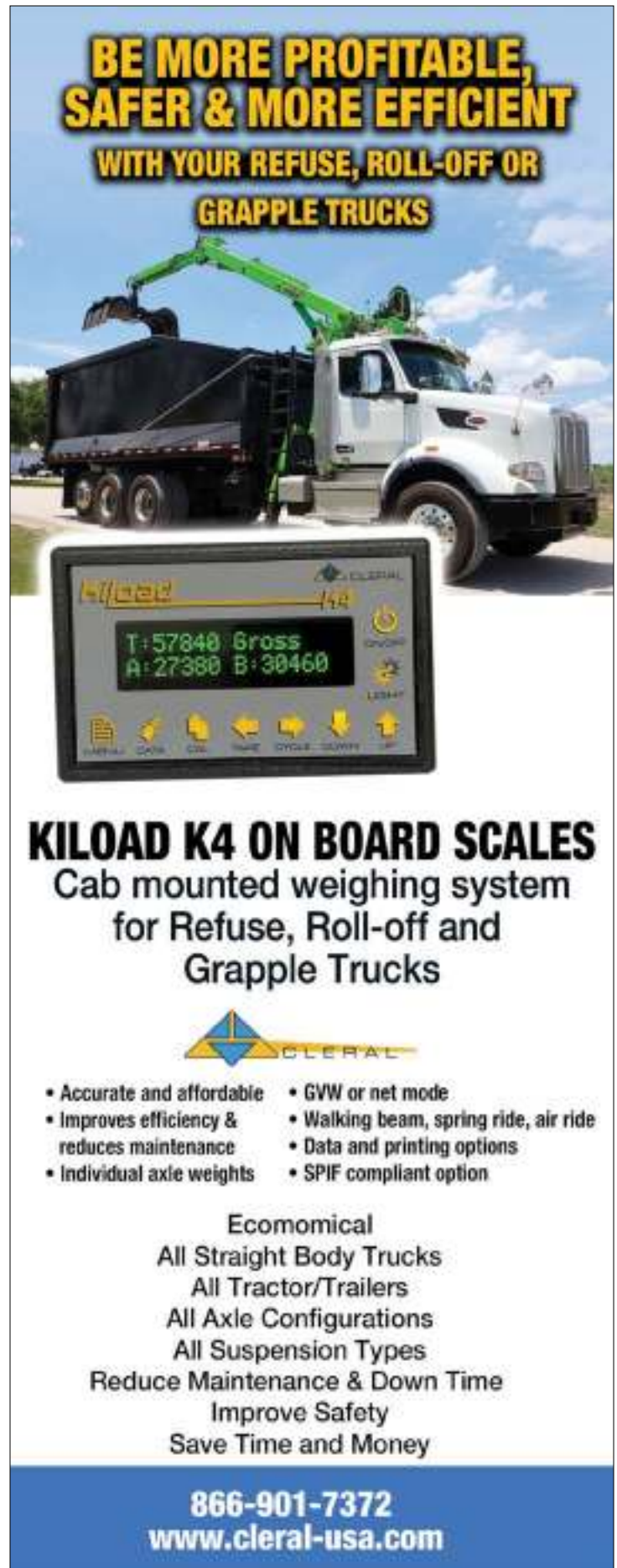
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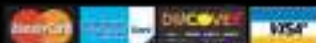
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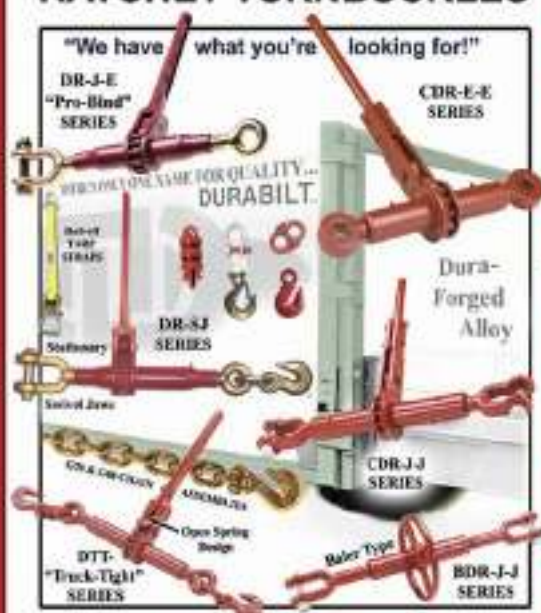
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2012 VOLVO VHD64F200

D11 395 HP, diesel, 471,747 mi., Easton-Fuller manual trans., walking beam susp., GALBREATH hoist, clean, double frame, diff. lock, IN/OUT controls



\$45,000!!

2009 FREIGHTLINER BUSINESS CLASS M2 112

Mercedes-Benz MBE 4000, 435 HP Eaton-Fuller 8LL manual, TufTrac susp., Tandem, well maintained, K-PAK hoist, IN/OUT controls, differential lock, 313,072 mi.



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2016-2017 VOLVO VHD-64-T 450 HP Volvo D13 engine, only 70,200 mi. only 5,180 engine hrs., engine brake, Allison HD-4560-P 6 spd. auto. trans., 20,000 lbs. front axle, 40,000 lbs. rear axle on Hendrickson suspension with FULL LOCKERS, a 4.56 gear ratio, hub piloted rims, A/C. This truck was previously municipal owned and maintained, has a 25 yd. Labrie side loader mounted to the back of the truck. \$148,832

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AR-450 FLOOR SIDE WALLS AND ROOF

ALLISON MD-3560-P 6-SPEED AUTO. TRANS.

2007 FREIGHTLINER M2-106 PRE-EMISSION 330 HP Mercedes Benz L906 engine, 324,281 ECM miles and 13,984 ECM hours, Allison MD-3560-P 6-speed automatic transmission, 18,000 lbs. front axle, 40,000 lbs. rear axle on Hendrickson suspension with FULL LOCKERS, hub piloted rims, A/C, and has about 17-18' of clean rust free frame behind the cab. This truck was previously municipal owned and maintained. \$146,624

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ALLISON HD - 4560 AUTO. TRANS.

2007-2010 CCC LETS-46 310 HP ISL Cummins engine with low miles, Allison HD-4560-P auto. trans. 20,000 lbs. front axle, 46,000 lbs. rear axle on Hendrickson HMX suspension, hub piloted rims, A/C. This truck was previously owned and maintained by a southern municipality. \$146,794

2007 - 2010 CCC LET-46 - PRE-EMISSIONS

345 HP ISL Cummins engine with low miles and low hours, Allison HD-4560-P automatic transmission, 20,000 lbs. front axle and 46,000 lbs. rear axle on Hendrickson suspension, hub piloted rims. This truck has a 25 yd. G&H 60/40 split body with AR-450 floors side walls and roof with dual cart tippers, and was previously municipal owned and maintained. \$146,779/8799

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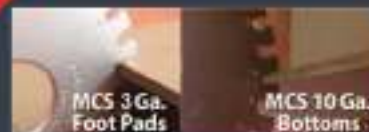
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