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GLOBAL RECYCLING

The Magazine for Business Opportunities & International Markets

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THE NEW TECHNOLOGY FOR THE SORTING OF ALUMINUM ALLOYS

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Recycling: Worldwide Solutions for the Circular Economy

Brigitte Weber
Editor-in-Chief

On March 18, the Global Recycling Day took place – an annual event that aims to raise awareness of the importance of recycling and encourage people to take action to reduce waste and protect the environment. The day brings together individuals, organizations, and governments from around the world to promote sustainable practices and highlight the benefits of recycling.

As underlined by the Global Recycling Foundation, that promotes Global Recycling Day, recycling is a key part of the circular economy and recognized in the UN's Sustainable Development Goals 2030. "Each year the 'Seventh Resource' (recyclables) saves over 700 million tons in CO_2 emissions and this is projected to increase to 1 billion tons by 2030. There is no doubt recycling is on the front line in the war to save the future of our planet and humanity."

Some days later, there was another awareness day: To address the 2022 waste crisis, the United Nations General Assembly proclaimed March 30 as International Day of Zero Waste. During this event, member states, organizations, civil society, the private sector, and other stakeholders are invited to engage in activities to encourage adopting sustainable consumption and production practices, fostering the transition to circularity, and raising awareness about the role of zero-waste initiatives. Having an active role in various EU-funded projects in the field of circular economy, ICONS (a private Italian group that develops large-scale projects in the field of science innovation and culture) took also part in this year's event with a joint social media campaign – labeled #CircularWasteEU – in collaboration with eight European projects.

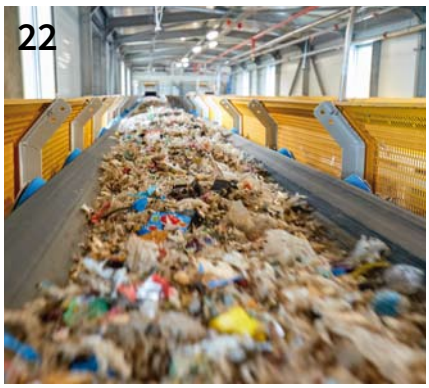
The well-known trade fair IFAT Munich, taking place in the Munich exhibition halls from May 13 to 17, 2024, will feature top-class speakers, more international exhibitors, and a varied event program, according to the organizers. "At the world's leading trade fair for water, sewage, waste and raw materials management, visitors can expect innovative environmental technologies, flanked by panel discussions, expert lectures, and live demonstrations."

In this issue of GLOBAL RECYCLING, you can also find interesting information regarding recycling. In Africa, there are more than one opportunities in the field of waste management (page 3). For example, the Republic of Ghana is on the road to circular economy (page 27 onward). The waste-to-energy technology on the African continent is growing as well (page 22 onward). As for the technical side of the recycling practice, we recommend the solutions presented in this Machinery section from page 38 onward.

We hope you get a lot of new and useful information from reading this current magazine.

Yours
Brigitte Weber (weber@msvgmbh.eu)

Cover Photo: SGM Magnetics



OPPORTUNITIES IN AFRICA

According to Indian market research company Mordor Intelligence, the African waste management market is set to grow.

As stated in 2022, prior to the 27th United Nations Conference of Parties (COP27), the African market size was estimated at 21.72 billion US-Dollar in 2024, and was expected to grow until 2029 at a CAGR (composed annual growth rate) of nearly five percent. Over the course of the years, the market would reach 27.70 billion US-Dollar, the company predicted. "The market is driven by government initiatives and projects." Furthermore, it was driven by the companies emerging in the sector to increase recycling needs.

Africa's urban population is growing fast: 3.5 percent per year. Although waste generation in Africa is currently lower than in the developed world, "SubSaharan Africa is expected to overtake the developed world as the dominant region in terms of total waste generation if current generation trends continue". Population growth, rapid urbanization, a growing middle class, changing consumption habits and production patterns, and global waste trade and trafficking would contribute to waste generation in Africa. "Inadequate waste management in Africa is causing economic, social, and environmental problems. However, there are some encouraging signs."

According to the market research company, with an average of 57 percent of MSW (Municipal Solid Waste) being biodegradable organic waste, the bulk of waste is dumped, typically in uncontrolled and controlled dumpsites. Only about four percent of the waste is recycled, often by informal actors (as with reuse). "Africa has lately become a dumping site for waste, particularly hazardous waste, often from developed countries," Mordor Intelligence gave account. "More than 130 people have died in landfill collapses in Africa in the past year, 2/3 of whom were women. To address these concerns, many social and technological innovations have emerged in the waste sector in Africa."

In comparison to the continent's low recycling rate, South Africa would stand out as a "shining beacon". In 2021, the country consumed approximately 3.4 million tons of packaging (glass, paper, metal, and plastic), with approximately 54 percent collected for recycling.

Increasing awareness towards the waste management

"One of the most significant decisions in the history of waste management in Africa was taken when African environment ministers gathered in Senegal in the middle of September 2022," Mordor Intelligence informed. "The ministers started the process of putting an end to open rubbish burning and dumping. This choice will have a variety of effects on the economy, the environment, and society. Millions of lives could be saved across the continent."

The market research firm identified waste management initiatives as the most urgently needed investment for climate infrastructure in African towns. "Among all projects that were disclosed, waste management projects ranked first (50 projects, or 27 percent of the total), followed by water management (28 projects, or 15.5 percent), transportation (27 projects, or 15 percent), renewable energy (25 projects, or 14 percent), and buildings (ten percent and five percent, respectively), with a total of 29 projects." 50 waste management projects totaling 935 million US-Dollar in value and more than 356 million US-Dollar in investment were reported by 31 local governments. "The key initiatives were phasing out open dump sites, building sanitary landfills, and redirecting trash from landfills to more sustainable waste recovery and treatment methods," Mordor Intelligence reported. 🌐 mordorintelligence.com/industry-reports/africa-waste-management-market

Photo: El Grincho / pixabay.com

Financier: The Africa Circular Economy Facility

The Africa Circular Economy Facility (ACEF) – which became operational in 2022 for an initial five-year period – is a multi-donor grants trust fund hosted by the Climate Change and Green Growth Department of the African Development Bank. "Its objective is mainstreaming the circular economy as an inclusive green growth strategy to help African nations fulfill their development priorities while meeting the goals of the Paris Agreement, Sustainable Development Goals (SDGs) and the African Union's Agenda 2063," the African bank group informs on the organization's homepage. "ACEF supports the creation of institutional frameworks to foster the circular economy and provides private sector support for the circular transition. It is funded by the Ministry of Foreign Affairs of Finland and the Nordic Development Fund." Furthermore, ACEF is working toward scaling its activities and becoming a leading financier of the circular transition in Africa.

According to an information leaflet published by the African Development Bank Group's Department of Climate Change & Green Growth, in 2023, ACEF supported national circular economy policy roadmaps and strengthened capacity to design policies that create an enabling environment for the circular economy. A multi-country project was implemented to help four countries to develop their national circular economy roadmap. In addition, fora and trainings for peer exchange between governments were created. Also in 2023, the Africa Circular Economy Facility supported the implementation of business development programs by providing technical assistance to start-ups and small grants to eligible SMEs through financial intermediaries.

Finally, yet importantly, ACEF fostered the African Circular Economy Alliance (ACEA) and its secretariat in creating a pool of circular economy champions and encouraging partnerships and knowledge sharing on the African continent and beyond. "Support is provided for African engagement on global and regional circular economy fora such as the World Circular Economy Forum (WCEF)."

https://www.afdb.org/sites/default/files/2023/05/12/acef_brochure_-_e_version_.pdf

GOOD PROSPECTS FOR THE TIRE RECYCLING DOWNSTREAM PRODUCTS MARKET

"Tire Recycling Downstream Product Market Report: Trends, Forecast and Competitive Analysis to 2030" is the title of the publication, which has been added to ResearchAndMarkets.com's offering.

Based on the market research store, the global market is expected to reach an estimated 5.5 billion US-Dollar by 2030 with a CAGR (compound annual growth rate) of 3.2 percent from 2024 to 2030. "The future of the global tire recycling downstream product market looks promising with opportunities in the cement manufacturing, pulp and paper mill, utility boiler, construction and infrastructure, sports complex and playground, and tire and rubber markets," the Irish company pointed out. "The major drivers for this market are increasing demand for high performance road construction materials, growing trend of scrap tires, and rising awareness towards the benefits of tire recycling."

Companies in the market would compete on the basis of product quality offered. Major players in this market would focus on expanding their manufacturing facilities, R&D investments, infrastructural development and leverage integration opportunities across the value chain. "With these strategies, tire recycling downstream product companies cater to increasing demand, ensure competitive effectiveness, develop innovative products and technologies, reduce production costs, and expand their customer base," the information said.

Foto: BRV

ResearchAndMarkets.com gave the following insights:

- Rubber powder is expected to witness the highest growth over the forecast period as it can be repurposed, reworked, or manually fashioned into new goods.
- Within this market, construction and infrastructure are expected to witness the highest growth due to rising demand for high-performance road construction materials so as to avoid cracks and holes.
- The Asia-Pacific region (APAC) is expected to witness the highest growth over the forecast period due to growing industrialization and urbanization in developing economies like China and India.

researchandmarkets.com

Textile Industry:

HOW PROJECT FINANCE CAN BRIDGE THE COMMERCIALIZATION GAP

The Netherlands-based company Fashion for Good, a global platform for sustainable fashion innovation, has teamed up with Spring Lane Capital (USA and Canada) to help unlock the capital needed to scale sustainable innovation in the textile industry.

According to the Dutch company, their report "The Great Unlock – Closing the Innovation Commercialization Gap through Project Finance Solutions" aims to enhance innovators' understanding of relevant industry stakeholders "and ultimately assists in further enabling the scaling of much-needed innovation". Furthermore, it would review the different types of capital available to close the funding gap within the commercialization stage. "It discusses the benefits, requirements, and opportunities related to project finance as a funding solution in this space, and highlights the roles

that various stakeholders would need to play in order to bring this to life."

Financial needs for next-generation materials, recycling, and processing

As underlined by the authors – Katrin Ley, Frans Jooste, Jordan Kasarjian, and Nathaniel Lowbeer-Lewis – in line with keeping global warming below 1.5 degrees, the fashion industry is currently in a race to achieve net zero by no later than 2050. "While existing solutions can significantly help reduce the impact of the industry, the scaling of innovations – in particular in next-generation materials, recycling and processing – is critical to enable a transition towards a net zero industry."

The path to scaling these innovations, however, would be fraught with financial hurdles. "The transition from R&D to commercial viability demands substantial capital, and innovators often face a financing challenge when they arrive at this first commercial production stage." This would result in a funding gap that prevents industry-wide adoption of new products and technologies. According to the report, the financing required to scale next-generation materials and processing innovations equates to roughly 400 billion US-Dollar, of which approximately 50 percent (or about 200 billion US-Dollar) would be needed in the form of debt financing. "While this number represents all potential debt financing required across the various stages of the scaling journey, the vast majority relates to the commercialization and adoption phases. Unlocking this capital is where project finance plays a key role."

Project finance

Project finance is a specialized type of financing in which the project's assets and cash flows serve as collateral for the loans used to finance the project, the authors of the report explained. Project finance would distinguish itself by mitigating risks, bolstering credit ratings, and allowing for greater borrowing capacity based solely on the project's viability. "It thereby offers a lifeline to innovators who may lack

Key Findings from the Report

According to Fashion for Good and Spring Lane Capital the main points of the report are:

- Complex Scaling Phases: Scaling innovations, specifically next-gen materials and processing technologies, will require significant allocations from a capital, time and expertise perspective.
- Commercialization Funding Gap: Debt financing, which represents 50 percent or 200 billion US-Dollar of the financing required to scale those innovations, plays a substantial role and can be unlocked through project finance solutions.
- Project Finance as Catalyst: Project finance allows innovations to scale faster and more effectively, compared to traditional funding channels.
- Prerequisites for Project Finance: Strong offtake, feedstock and engineering, procurement, and construction (EPC) contracts are vital for project success.
- Call-to-Action: Innovators, brands, financiers, and supply chain partners all have a role to play in unlocking the funding needed to bridge this commercialization funding gap.

Photo: SOEX

creditworthiness in traditional financing channels."

In addition, this type of funding is particularly beneficial for new technologies because it allows them to scale effectively and faster compared to traditional funding channels, Fashion for Good and Spring Lane Capital argued. Project finance would also give access to broader debt capital markets and offer longer repayment periods compared to corporate finance, making it more attractive for technology development.

As underlined, the report would provide contractual templates and highlights case studies and lessons learned from innovators during their scaling journey.

https://reports.fashionforgood.com/wp-content/uploads/2023/10/REPORT_THE-GREAT-UNLOCK_FASHION-FOR-GOOD-SPRING-LANE-CAPITAL.pdf

COLOMBIA, JAMAICA AND PANAMÁ COMBAT URBAN PLASTIC POLLUTION

Last year, the governments of Colombia, Jamaica and Panamá launched a 42-million-dollar project to combat plastic pollution by mainstreaming circularity at city-level.

The three countries will be supported by the United Nations Environment Programme (UNEP), with funding from the Global Environment Facility (GEF) and support from the Cartagena Convention Secretariat, the project to reduce marine plastics and plastic pollution in Latin American and the Caribbean cites through a circular economy approach. As reported, the aim is to adopt closed-loop policies at city level, engage the private sector to do the same and create an inter-city network among Latin America and the Caribbean cities on marine plastics and plastic pollution more broadly, raising awareness on best practices. According to the UNEP, nearly one-third of all plastic is single-use, 32 percent contaminates soil and freshwater ecosystems and as much as ten million tons are released into the ocean annually, worsening the triple planetary crisis – climate change, nature and biodiversity loss, and pollution and waste. "Without decisive action, this is expected to triple by 2060," the organization underlined. Circularity would aim to keep materials such as plastics at their highest value throughout the value chain for as long as possible by transforming the way "we design, make, use and discard products". The global economy is only 8.6 percent circular – a figure slightly increased in Latin America and the Caribbean at ten percent, UNEP added.

Exposure to mismanaged plastics can harm human health and marine species, causing entanglement and injury, ingestion, suffocation and toxic contamination. Additionally, the open burning of plastics may release toxic persistent organic pollutants – chemicals that do not break down in the environment and contaminate air, water and food. By prioritizing innovative interventions upstream and identifying products that contain chemicals of concern, policy and fiscal instruments would be applied to cut the use of unnecessary or toxic plastic products, UNEP emphasized. Moreover, that would also limit and ban the open burning of plastics and develop reuse and refill systems, as well as new circular business models in collaboration with those along plastic value chains.

The UN organization is convinced that a rapid shift to a circular economy can diminish the volume of plastics polluting the ocean by over 80 percent, reducing reliance on the creation of new plastic and saving governments over 70 billion US-Dollar in less than 20 years. What is more, these measures were able to create an additional 700,000 jobs by 2040.

The four-year project would bring Barranquilla and Cartagena in Colombia, Kingston and Montego Bay in Jamaica and Panamá City and Colón in Panamá – alongside other cities in Latin America and the Caribbean – in line with international best practices.

unep.org

Photo: Dee / pixabay.com

ALUMINUM PRODUCTION WASTE CAN CONTRIBUTE TO GREEN STEEL

The German Max-Planck-Institut für Eisenforschung (center for iron research) has developed an economical process with green hydrogen to extract CO_2-free iron from the toxic red mud generated in aluminum production.

According to the information, scientists at the Max-Planck-Institut für Eisenforschung have shown how green steel can be produced from aluminum production waste in a relatively simple way. In an electric arc furnace similar to those used in the steel industry for decades, they convert the iron oxide contained in the red mud into iron using hydrogen plasma. "With this process, almost 700 million tons of CO_2-free steel could be produced from the four billion tons of red mud that have accumulated worldwide to date – which corresponds to a good third of annual steel production worldwide," the institute underlined. "And as the Max Planck team shows, the process would also be economically viable."

According to forecasts, demand for steel and aluminum will increase by up to 60 percent by 2050. Yet the conventional production of these metals has a considerable environmental impact. Eight percent of global CO_2 emissions come from the steel industry, making it the sector with the highest greenhouse gas emissions. Meanwhile, the aluminum industry produces around 180 million tons of toxic red mud every year, which is highly alkaline and contains traces of heavy metals such as chromium. "In Australia, Brazil and China, among others, this waste is at best dried and disposed of in gigantic landfill sites, resulting in high processing costs. When it rains heavily, the red mud is often washed out of the landfill, and when it dries, the wind can blow it into the environment as dust. In addition, the highly alkaline red mud corrodes the concrete walls of the landfills, resulting in red mud leaks that have already triggered environmental disasters on several occasions, for example, in China in 2012 and Hungary in 2010. In addition, large quantities of red mud are also simply disposed of in nature," the Max-Planck-Institut für Eisenforschung described the global waste situation.

Potential to save 1.5 billion tons of CO_2 in the steel industry

"Our process could simultaneously solve the waste problem of aluminum production and improve the steel industry's carbon footprint," Matic Jovičevič-Klug was cited, who played a key role in the work as a scientist at the institute. In a study published in the journal Nature, the team showed how red mud can be utilized as a raw material in the steel industry. "This is because the waste from aluminum production consists of up to 60 percent iron oxide. The Max Planck scientists melt the red mud in an electric arc furnace and simultaneously reduce the contained iron oxide to iron using a plasma that contains ten percent hydrogen. The transformation, known in technical jargon as plasma reduction, takes just ten minutes, during which the liquid iron separates from the liquid oxides and can then be extracted easily. The iron is so pure that it can be processed directly into steel." As reported, the remaining metal oxides were no longer corrosive and solidify on cooling to form a glass-like material that can be used as a filling material in the construction industry. Other research groups had produced iron from red mud using a similar approach with coke, "but this produces highly contaminated iron and large quantities of CO_2. Using green hydrogen as a reducing agent avoids these greenhouse gas emissions." Isnaldi Souza Filho, Research Group Leader at the Max-Planck-Institut für Eisenforschung, is convinced that green hydrogen used to produce iron from the above-mentioned four billion tons of red mud could enable the steel industry to save almost 1.5 billion tons of CO_2.

An economical process

The heavy metals in the red mud could also be virtually neutralized using the process. "After reduction, we detected chromium in the iron," Matic Jovičevič-Klug was quoted. "Other heavy and precious metals are also likely to go into the iron or into a separate area. That's something we'll investigate in further studies. Valuable metals could then be separated and reused." Furthermore, heavy metals that remain in the metal oxides are firmly bound within them and can no longer be washed out with water, as can happen with red mud.

"However, producing iron from red mud directly using hydrogen not only benefits the environment twice over; it pays off economically too, as the research team demonstrated in a cost analysis," the Max-Planck-Institut für Eisenforschung emphasized. "With hydrogen and an electricity mix for the electric arc furnace from only partially renewable sources, the process is worthwhile, if the red mud contains 50 percent iron oxide or more. If the costs for the disposal of the red mud are also considered, only 35 percent iron oxide is sufficient to make the process economical. With green hydrogen and electricity, at today's costs – also taking into account the cost of landfilling the red mud – a proportion of 30 to 40 percent iron oxide is required for the resulting iron to be competitive on the market." According to Isnaldi Souza Filho, these are conservative estimates because the costs for the disposal of the red mud were probably calculated rather low.

There are more advantages: electric arc furnaces are widely used in the metal industry – including in aluminum smelters – as they are used to melt down scrap metal. In many cases, the industry would need to invest only a little to become more sustainable. "It was important for us to also consider economic aspects in our study," Dierk Raabe, Director at the Max-Planck-Institut für Eisenforschung, was cited. "Now it's up to the industry to decide whether it will utilize the plasma reduction of red mud to iron."

mpie.de

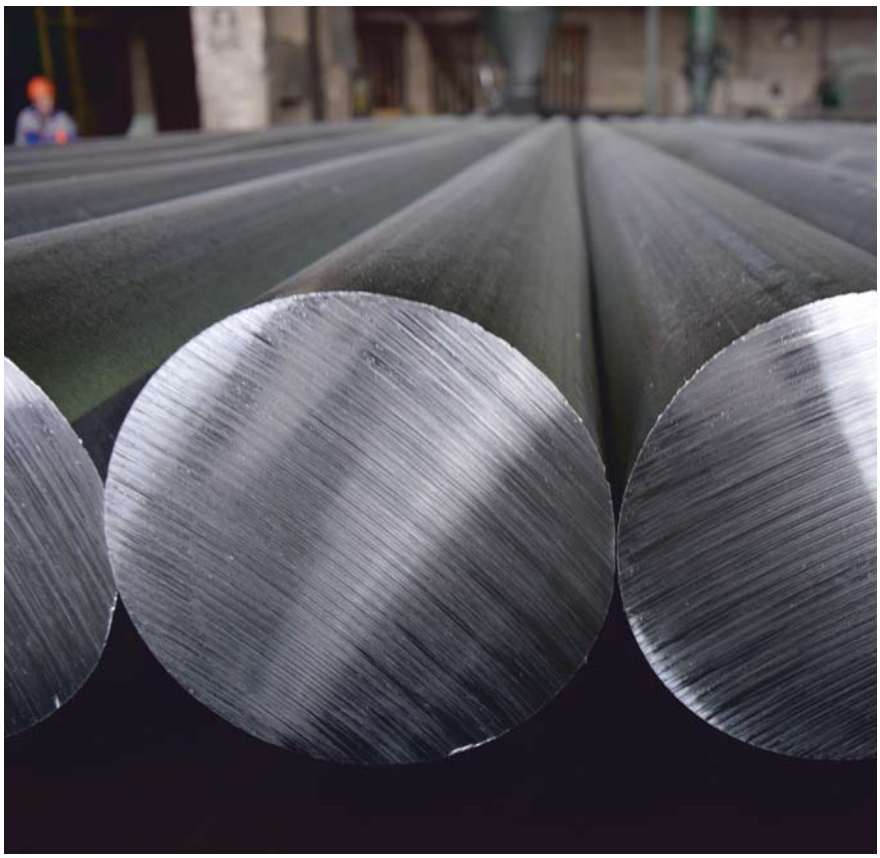


Photo: pixabay.com

AIMING FOR EMISSION-FREE PULPING

Ten research organizations, universities, and companies are establishing a research program with around 20 full-time researchers. The Emission Free Pulping program aims to significantly reduce biomass burning and increase the product yield of wood material used for pulping from approximately 50 percent to around 70 percent. The program, under the joint leadership of VTT Technical Research Centre of Finland and RISE Research Institutes of Sweden, is projected to have a budget of around 15 million Euro over the next five years. As reported by the Finnish VTT, it intends to find ways to improve energy efficiency, enhance the efficiency of wood usage and conversion to products, achieve emission-free pulping (especially carbon dioxide emissions), and significantly reduce water usage in the processes. Industry leaders and scientists worldwide are invited to join the consortium and participate in the research aiming to transform pulping processes for better energy and material efficiency.

vttresearch.com/en, ri.se/en

REPORT ON PAPER CUP RECYCLING IN THE USA

The NextGen Consortium, an industry collaboration managed by Closed Loop Partners (a company comprised of three key business segments: Closed Loop Capital Management, the Center for the Circular Economy and Circular Services), released a report with findings to accelerate paper cup recycling in the USA. It assesses the role of each stakeholder across the recovery value chain – including paper mills, materials recovery facilities (MRFs), brands, consumers and local communities – and provides recommended actions to increase paper cup recovery opportunities and advance a more circular system.

The report “Closing the Loop on Cups: Collective Action to Advance the Recovery of Paper Cups in the U.S.” can be downloaded at closedlooppartners.com/closing-the-loop-on-cups/.

THE GLOBAL RECYCLED CARBON FIBER MARKET

The increased environmental regulations established by regulatory bodies like the European Union and the US Environmental Protection Agency to reduce carbon emissions are driving the demand for recycled carbon fibers, market intelligence company Straits Research pointed out. The need for lightweight car materials has also increased due to rising pollution limits in China and India.

As reported, recycled carbon fiber is derived from numerous dry fiber and prepreg (a composite material made from "pre-impregnated" fibers and a partially cured polymer matrix) scrap sources and carbon fiber waste generated during the production of thermoset carbon fiber-reinforced composites. Approximately 30 percent of the initial carbon fiber output is lost when manufacturing carbon-based products. Recycled carbon fibers are comparable to virgin carbon fiber in terms of tensile strength, chemical resistance, and thermal expansion; they are also lightweight.

According to Straits Research, the global recycled carbon fiber market size was valued at 191,391 thousand US-Dollar in 2022. It is estimated to reach 572,661 thousand US-Dollar by 2031, growing at a CAGR (compound annual growth rate) of 12.95 percent during the forecast period (2023–2031). "Recycled carbon fiber is utilized in the automotive, aerospace, and military industries due to its superior advantages, which include affordability, energy efficiency, lightweight, and environmental sustainability," the company informed. Increased environmental rules to decrease carbon emissions would drive the need for recovered carbon fibers. In addition, the increased need for lightweight materials in the aerospace and military industry is anticipated to considerably drive market expansion during the research period, Straits Research expects.

As emphasized, recycled carbon fiber is more cost-effective and ecologically friendly than raw carbon fiber. For instance, the European End-of-Life Vehicles Directive would support recycling. "It provides financial incentives for eco-friendly automobiles. Annually, eight to nine million tons of waste are generated in the European Community due to discarded autos. In addition, the Aircraft Fleet Recycling Association (AFRA) promotes sustainable practices for aircraft recycling. Additionally, the lack of landfill capacity for waste disposal has raised the global need for recyclable products. The increasing use of recyclable and eco-friendly materials in the key end-user sectors is projected to provide substantial benefits for market growth over the forecast period."

Regional Analysis

As per the market intelligence company, the Asia-Pacific region is seen as the most significant shareholder in the global recycled carbon fiber market and is anticipated to grow at a CAGR of 13.66 percent during the forecast period. "The growing need for three-dimensional (3D) printed components and parts across all end-use sectors is one of the primary forces driving market growth in this field," Straits Research is convinced. "The rising demand for sporting items further facilitates this region's rise. Due to its strength and lightweight, carbon fiber is frequently used in this industry. Additionally, China is the dominant nation in the region. China is expanding its recycling infrastructure and promoting low-carbon, environmentally friendly textile production while maximizing the use of textile waste. Due to an increasing emphasis on reusing product resources, India held the second-largest regional share. Recycling is crucial for a nation to accomplish its environmental objectives. Additionally, aiding in reducing carbon footprint substantially reduces the overall expenses involved with creating and producing materials and goods."

North America is expected to grow at a CAGR of 12.83 percent over the forecast period. According to the company, the expansion of the automotive and aerospace industries drives the rise of the North American market. Strategic developments, the presence of well-established automakers, the dominance of recycled carbon fiber producers, and technological advancements in recycled carbon fiber products all contribute to the market expansion in this region, the research firm predicts. "The presence of significant countries, such as the United States and Canada, which are among the fastest-growing emerging economies globally, propels market growth in the area."

straitsresearch.com/report/recycled-carbon-fiber-market/request-sample

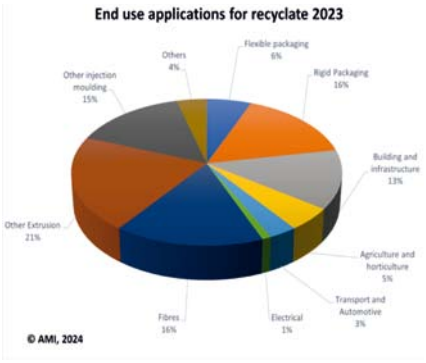
Photo: Sven Halsdorf / pixabay.com

MECHANICAL PLASTICS RECYCLING PRODUCTION TO GROW BY 2030

According to UK and USA-based Applied Market Information Ltd (AMI), mechanical recycling capacity surpassed 54 million tons in 2022, and over 36 million tons of recyclate was produced globally.

By 2030, mechanical recycling output will reach close to 55 million tons, AMI Consulting estimates; that would be an increase of 52 percent on 2022 volumes. “That being said, the actual global recycling rate of commodity plastics is only anticipated to reach 16.5 percent by 2030, highlighting the vast opportunities within the industry.”

While some regions, such as Europe and Northeast Asia were actively trying to reduce the use of excessive packaging, the increase in plastic usage in other areas, such as Africa and the Indian Subcontinent would outweigh those efforts. “The increase of plastics consumption in such regions is broadly driven by urbanization and growing middle classes and will contribute to increasing global plastics consumption for the foreseeable future,” the company stated.



Graphic: AMI

Likewise, Europe and Northeast Asia would also boost “longstanding and relatively developed collection infrastructure for recyclables, albeit some volumes go to incineration as opposed to material recycling. In many other parts of the world, the informal sector plays a significant role in collecting post-consumer waste, mainly focusing on bottles and flasks. Unfortunately, other post-consumer applications, especially films or non-bottle rigid plastics still lack sufficient collection systems.”

According to AMI, PET had the highest recycling rate, 27.1 percent in 2022, primarily due to the well-established collection of PET bottles, through formalized collections, bottle deposit schemes, and the informal sector. As underlined, the approval of food-grade rPET was also gaining traction in countries across Northeast Asia, Southeast Asia, and the Indian Subcontinent, “opening new opportunities for rPET use in higher value food grade applications”.

AMI’s report “Mechanical Plastics Recycling – The Global Market” quantifies the market for mechanical recycling, analyzing the supply and demand balance, along with an evaluation of current production by region, the publisher gave account. Furthermore, it would also provide a detailed analysis of feedstock supply, the waste plastics value chain, and end-use applications for recyclate, with an examination of potential future absorption. “It is relevant to all stakeholders in the plastics industry value chain, from resin producers to brand owners and end users of plastic products,” the market intelligence and consulting firm is convinced.

amiplastics.com

GOOD OUTLOOK FOR THE AIRCRAFT RECYCLING MARKET

According to US-based business research and consulting company MarketDigits, the aircraft recycling market was valued at 5.2 billion US-Dollar in 2023 and is projected to reach 9.3 billion US-Dollar by 2030. The market size is predicted to grow at a CAGR (compound annual growth rate) of 8.7 percent during the forecast period of 2023-2030.

As airlines modernize fleets and regulations emphasize environmental responsibility, the demand for aircraft recycling has surged, the firm pointed out. "This market encompasses the dismantling, recycling, and repurposing of retired aircraft components and materials, fostering eco-friendly practices. Key players in the industry are developing advanced technologies to maximize material recovery and minimize environmental impact. Government initiatives and regulations promoting responsible disposal further drive market growth."

North America dominates the market

North America stands as the dominant force in the aircraft recycling market, exerting substantial influence over the industry's trajectory, MarketDigits told. "Both the United States and Canada play integral roles in this regional dominance. The presence of a robust aviation sector, characterized by various retired aircraft, positions North America as a key hub for aircraft recycling activities." In the USA, with its extensive aviation infrastructure and regulatory emphasis on sustainable practices, the market has witnessed significant growth. Canada, known for its commitment to environmental stewardship, would contribute to the region's dominance through eco-friendly aircraft recycling initiatives. "The combined efforts of these North American nations underscore the market's leadership position, leveraging advanced technologies and stringent environmental standards to shape the future of sustainable aircraft recycling practices."

Photo: Schrott24 / Jan Pannenbäcker

Largest market share: narrow-body segment

The aircraft recycling market is segmented into narrow-body, wide-body, and regional. According to the business research and consulting company, this recycling market is prominently led by the narrow-body segment. This dominant force in the industry could be attributed to the widespread use of such aircrafts across various airlines and their relatively shorter operational lifespans, resulting in a higher frequency of retirements. "The demand for efficient, eco-friendly disposal solutions for these aircraft has propelled the narrow-body segment to the forefront of the recycling market," MarketDigits stated. "Recycling processes tailored to address the unique characteristics of narrow-body aircraft further solidify this segment's supremacy, reflecting the industry's commitment to responsible and effective aircraft disposal."

marketdigits.com/request/sample/2563

INTERNATIONAL AUTOMOTIVE RECYCLING CONGRESS 2024

June 19 – 21, 2024, Antwerp (Belgium)

IARC, the international platform for circular economy and automotive recycling, invites to its upcoming event. IARC 2024 intends to gather minds, ideas, and solutions addressing the industry's most pressing challenges and opportunities. The event also aims to unite over 300 decision-makers from various sectors, including automotive manufacturers, metal suppliers, plastic scrap traders, recyclers, shredder operators, policymakers, and more. With a diverse array of perspectives and expertise, this event serves as a hub for collaboration, innovation, and sustainable practices.

icm.ch

IRELAND'S DEPOSIT RETURN SCHEME POWERED BY SENSONEO'S IT SOLUTION

In February this year, Ireland became the 15th European country to introduce the Deposit Return System (DRS) for single-use beverage packaging. Slovakian firm Sensoneo accompanies the project with its IT solution, serving as the central infrastructure for the entire DRS system in Ireland.

The Irish DRS administrator is the company Re-turn. The entire scheme is powered by a software solution from Sensoneo, the internationally orientated provider of smart waste management solutions informed. This end-to-end and ready-to-integrate software for DRS would gather data from all sources and enable seamless integration between all stakeholders within the process chain. The solution "is built on cloud-based infrastructure and is agnostic with any return vending machine".

Photo: Sensoneo

Ireland is already the sixth country with the software solution from the Slovakian company. As underlined, Sensoneo won all the last six tenders for DRS in Europe, most recently in Austria, "and successfully implemented the IT solution for the world's largest centralized DRS in Romania, and DRS systems in Slovakia, Malta, and Hungary."

The IT system for the Irish DRS was implemented in eleven months since the project kicked off in March 2023. Currently, approximately 60 percent of single-use beverage packaging is being collected in Ireland for recycling purposes, Sensoneo reported. "The Deposit Return Scheme in Ireland has the potential to reduce littering and increase Ireland's recycling rates by 30 percent. These numbers will result in reduced landfill waste and significantly support the protection of the environment."

sensoneo.com

E-COMMERCE BOOM AND SUSTAINABLE PACKAGING NEEDS LET THE CONTAINERBOARD MARKET GROW

According to ResearchAndMarkets.com, the containerboard market is forecasted to grow by 27.08 billion US-Dollar during 2023-2028, accelerating at a CAGR (compound annual growth rate) of 3.12 percent during the forecast period. "The market is driven by a booming e-commerce industry, increasing need for sustainable packaging solutions, and increasing rate of urbanization," the Ireland-based market research store informed. "This study identifies the advent of flexible packaging another prime reason driving the containerboard market growth during the next few years. Also, incorporation of advanced technologies across global containerboard market and increasing demand for innovative lightweight materials will lead to sizable demand in the market." The report titled "Global Containerboard Market 2024-2028" would provide a holistic analysis, market size and forecast, trends, growth drivers, and challenges as well as vendor analysis covering around 25 vendors.

Photo: Oliver Fuß / pixabay.com

researchandmarkets.com

MOBILE APPLICATION FOR RECYCLING IN LEBANON

As reported by the Lebanese platform Berytech in January this year, "ReList" was launched, "the first mobile application in Lebanon for recyclables trading". Lebanese municipalities would face mounting difficulty in managing the growing volumes of unsorted waste with little to no funding, as many were looking to recycling as a sustainable solution for waste management, the information said. "ReList" is a solution under the Diverting Waste by Encouraging Reuse and Recycling (DAWERR) project that provides businesses across Lebanon access to buyers and sellers of recyclables. Furthermore, it would increase access to markets, raw materials, and fair prices and reduce transportation distances and costs, Berytech pointed out. By connecting sellers of recyclable materials with potential buyers, the application "not only creates economic opportunities but also significantly contributes to a cleaner environment". The launch event took place with representatives of ministries as well as the DAWERR partners USAID, Berytech, Compost Baladi, and ECODIT Liban, the heads of DAWERR municipalities, representatives from sorting facilities, factories, traders and exporters of waste, international organizations in Lebanon, and the private sector.

berytech.org

NEW PARTNER IN EASTERN EUROPE

German-based company Hellweg Maschinenbau, a global manufacturer of digitally controlled grinders for effective, energy-saving plastics recycling, has a new sales partner in Poland. FLEXAL Group Sp. z o. o. in Posnan will be responsible for sales, maintenance and technical advice for Hellweg grinders; the portfolio ranges from small units for grinding sprues to high-performance systems for solid parts, films and sheets with a throughput of five tons per hour and more. As emphasized by Hellweg Maschinenbau, the Polish company has more than twenty years of experience in machine sales and extensive knowledge of the technological processes used in the plastics industry. In addition to grinders from Hellweg, the FLEXAL product range would also include pellet dryers, centralized feeding systems, conveyor belts, laboratory extruders, robots, dosing devices and much more.

hellweg-granulators.com/en/
flexal.pl/en/

Advertorial:

UNTHA SHREDDING TECHNOLOGY FULLY ACQUIRES GERMAN BUSINESS

Austrian-headquartered UNTHA shredding technology has announced the 100 percent acquisition of UNTHA Germany – in the same month, the company revealed 98 Million Euro global orders from the last financial year. Over 500 single, two and four shaft UNTHA shredders are already installed throughout the country – not to mention the wider DACH region. But in response to rising demand, UNTHA's investment in people and infrastructure will support the goal to drive 50 percent growth in Germany alone over the next three years.

UNTHA is no stranger to the German market. Since the 1990s, a dedicated distribution partner has driven a local brand presence there. Using the UNTHA Germany name, the team began to build its reputation throughout the country, particularly when developing sophisticated shredding systems for difficult applications, including production waste, data destruction, e-scrap, nuclear waste, and more.

In fact, as a result of this brand growth, UNTHA became a minority shareholder in the firm in 2014, before investing incrementally in more of the company, in the years that followed. This led to the creation of two separate entities – a machine sales business, and URT Umwelt- und Recyclingtechnik GmbH, a specialist-engineering firm with expertise in complex refrigeration and e-scrap recycling plants. Everything at URT remains unchanged, with the successful plant designer a continued independent partner of UNTHA Germany. But, the shredder sales business is now 100 percent owned by UNTHA shredding technology.

UNTHA shredding technology's CFO, Andrea Gratzer, and head of global sales and business development, Peter Streinik, have become UNTHA Germany's managing directors. Longstanding colleague Daniel Wresnik – who has been with UNTHA since 2009 – has been promoted to sales director. And Alex Hofmann – who has represented UNTHA in Germany for over 25 years – has been promoted to operations director, with senior responsibility for technical sales support, application engineering, after sales, marketing, and more. There are plans to recruit an additional two colleagues no later than summer, taking the team to 15. Commenting on the development of the UNTHA Germany brand, Peter Streinik said: "Globally, we're known for being shredding pioneers – a business that isn't afraid of challenging customer requirements. Technical excellence is in our DNA, and our colleagues in Germany represent this perfectly. They've been very active in the market since the early 1990s – a level of experience you don't typically see from competitors. It's the perfect time to 'officially' bring them into the UNTHA group. As our growth continues – not just throughout Europe but overseas – it's important that we respond to market requirements and, importantly, customer demand. From small standalone recycling machines to single and two-step waste processing lines, plus complex systems created alongside a range of specialist plant designers, we can now deliver all of this in Germany – with outstanding, local aftersales support too."

The UNTHA Deutschland GmbH team at the company site in Karlstadt

Photo: UNTHA shredding technology GmbH

Andrea Gratzer continued: "Investment here doesn't just represent growth for our business – it will drive progressive change for the wider industry too. Because UNTHA Germany is now part of our group, customers benefit from faster lines of communication, direct access to our innovation team, more responsive support, and local expertise. This leads to greater operational success and, ultimately, profitability. It's all part of our 'think global, act local' strategy, which sees our brand continue to grow in multiple territories worldwide."

UNTHA shredding technology's story began in 1970, in Salzburg – which remains home to the company's HQ over 50 years later. Today, the company employs circa 500 people, with over 10,000 shredders installed across six continents.

untha.com

TWO COMPANIES INTEND TO PARTNER IN PGM RECYCLING BUSINESS

Elemental Holding SA and Mitsubishi Corporation have agreed to form a strategic partnership in platinum-group metals (PGM) recycling, covering Elemental's global operations from collection to refined metal.

According to the information, the strategic partnership will combine Elemental's and Mitsubishi's expertise and resources in collecting and pre-processing of spent automotive catalytic converters and the smelting, refining and marketing of refined PGM metals. Both parties would work together "across a number of avenues to scale and grow Elemental's globally leading PGM recycling business". This transaction is subject to customary conditions and was expected to close in early 2024.

Elemental – a global active company in urban mining with a focus on extracting strategic metals from various recycled metal sources and subsidiaries in 35 countries on three continents (Europe, Asia and North America) – has built an integrated PGM smelter and refinery in Southern Poland that uses 100 percent recycled feedstock. As underlined, the facility will significantly contribute to critical mineral independence in the European Union. "Through Elemental's integrated PGM recycling production chain, the Elemental-Mitsubishi partnership will aim to deliver the greenest and most sustainable PGMs in the world to its customers."

As part of the strategic partnership, Mitsubishi will provide a trade finance working capital facility to support ramping up of Elemental's PGM smelter and refinery to full production. As reported, the Japan-based corporation will also make an equity investment in Elemental's operating subsidiary in the United States. The parties intend to grow their partnership through further collaboration in PGMs and other metals. Both companies would benefit from their partnership. "Mitsubishi is the leading trader of PGMs in the world and will be able to add significant value to our business through their marketing expertise, global network, balance sheet and reputation," Pawel Jarski, CEO and Founder of Elemental, was cited. Following the 290 million US-Dollar equity capital raise completed in January 2023, "we are thrilled to add another blue-chip partner to our unique recycling business model. The partnership with Mitsubishi will help us deliver more recycled critical minerals to the European Union and beyond."

Koichiro Takagi, Mineral Resources Trading Division COO of Mitsubishi Corporation, welcomes the collaboration as well. "This partnership will help us strengthen our supply chain and underpin our ability to deliver green PGMs for the growing demand of PGM including from the hydrogen economy. We also view this partnership as a potential step to expand our partnership with Elemental in the recycling business of other critical minerals such as base metals and battery metals on a global basis."

elemental.biz
mitsubishicorp.com/jp/en/

Photos: Elemental Holding SA

ISCC PLUS CERTIFICATION FOR GREENBACK'S OPERATIONS IN CUAUTLA

Greenback Recycling Technologies has received the International Sustainability and Carbon Certification ISCC (International Sustainability and Carbon Certification) PLUS for its recycling facility in Cuautla, Mexico, and its final product. This recognition is granted to companies voluntarily committed to global sustainability objectives.

According to Greenback, the company's adherence to the rigorous ISCC PLUS criteria would signify "well-managed operations that meet legal and safety standards, while also demonstrating environmental and social responsibility in production". The certified product, π-Oil, is acknowledged as a circular feedstock, "ensuring that waste is recycled within the economic system without being discarded".

ISCC PLUS is a globally recognized voluntary sustainable certification scheme applicable to the bio economy and circular economy for food, feed, chemicals, plastics, packaging and waste. It is used as a tool to reduce greenhouse gas emissions and establish sustainable production with traceable supply chains from the origin to the final user using environmental, economic and social criteria.

As underlined, ISCC PLUS brings transparency and trust to the plastics recycling value chain. "The audit-based certification works hand-in-hand with eco2Veritas, Greenback's proprietary intelligent tracking system." It would support the ISCC PLUS annual auditing process by giving a real-time view with detailed and accurate data on the circular process at any point in time.

Greenback Recycling Technologies is a UK-based advanced recycling company founded in 2018. With a decentralized, small-scale plants operating on Enval microwave-induced recycling processes, the flexible, multilaminate plastics are recycled into π-Oil and aluminum.

greenback.earth/en/
iscc-system.org/certification/iscc-certification-schemes/iscc-plus/
greenback.earth/en/3b_eco2veritas/

HENSEL RECYCLING ACQUIRED CALIFORNIAN RED FOX RESOURCES

Hensel Recycling, a company in precious metals recycling headquartered in Germany, has completed acquiring California-based precious metals recycler Red Fox Resources.

According to the German company, the partnership will strengthen Hensel Recycling's position in the USA and North American markets. "We welcome the Red Fox team to the Hensel Recycling Group family. Both companies share the same core values and passion for recycling, and we look forward to a successful future," Thomas Hensel, Chairman of Hensel Recycling Group, was quoted. Red Fox Resources is a specialist focused on recycling diesel particulate filters and emission control catalysts found in mobile, stationary, and industrial applications. "The company has deep technical and commercial experience in catalyst design and application, positioning it to buy material directly, or to help customers recycle their precious metal bearing materials."

Hensel Recycling has been active in the North American market for almost 15 years and has established itself as one of the leading providers in the recycling of materials containing precious metals. "Originally specializing in the recycling of metal foil converters, the company has continuously expanded its material portfolio in recent years. The East Coast facility in West Berlin, NJ is one of the largest branches of the Hensel Recycling Group with more than 30 employees."

Foto: Hensel Recycling

Red Fox Resources is also pleased. "This strategic acquisition brings immediate benefits to Red Fox Resources and its customers across North America, tapping into Hensel's expertise in precious metals management, processing, technical skills, and vast industry connections," the American company pointed out. "Hensel intends to support Red Fox Resources to continue what we do best, procuring and processing precious metals from the heavy-duty vehicle and industrial markets. Under the Hensel ownership, it will be business as usual at Red Fox Resources, ensuring continuity for all customers, suppliers, and partners. Additionally, the customer-facing Red Fox management team will remain unchanged."

As underlined by the new owner, the additional recycling capacity of Red Fox Resources will allow Hensel Recycling to better serve the American market. "The newly acquired location on the West Coast also enables optimization of logistics processes, resulting in more flexible and faster service to customers and lower shipping costs. This will not only help Hensel Recycling to become more competitive but will also reduce its carbon footprint by reducing long transportation routes." The strong partnership would perfectly combine the resources and strengths of both companies to enhance procurement services, analytical methods, processing capabilities and smelter relationships.

hensel-recycling.com/en/
redfoxresources.com

ERIEZ STRENGTHENS ITS CAPABILITIES WITH CARDIFF UNIVERSITY COLLABORATION

Eriez has announced the inauguration of its Research and Development hub, Eriez at sbarc, located at Cardiff University in Wales.

According to the company, this strategic partnership with Cardiff Innovations would underscore its dedication to fostering innovation and expanding its research and development initiatives. In the meantime, Eriez' Wales-based R&D team operates primarily from this new, state-of-the-art facility.

The provider of separation technologies began working with Cardiff University when Eriez joined the advisory board for the university's Magnetic Materials & Applications (MAGMA) research center. "The relationship progressed into a successful Engineering and Knowledge Transfer Partnership (eKTP) from 2019 to 2022," the company pointed out. "The result of this

effort is a groundbreaking new series of metal detectors from Eriez, which are scheduled to launch in early 2024."

Further initiatives

Gareth Meese, Managing Director of Eriez-Europe, emphasized the success of the eKTP: "The fusion of the technical prowess of the University with Eriez' industry expertise led to significant advancements in signal processing and electronic design for our new metal detectors." The collaborative partnership with Cardiff University would provide Eriez with streamlined access to support a seamless communication pipeline. In addition to these achievements, Eriez has privately funded a project with the Cardiff University School of Engineering, focusing on enhancing the performance and reliability of metal detector coils.

As of 2024, Eriez continues its partnership with Cardiff University on an Artificial Intelligence (AI) feasibility study, supported by InnovateUK, exploring AI techniques in metal detection for the food and pharmaceutical industries. Eriez is also actively involved in supporting an Accelerated Knowledge Transfer (AKT) initiative, investigating and developing AI applications within metal detection and other related fields, per the statement of Chris Dyer, Research and Development Engineer, Eriez-Europe.

cardiff.ac.uk/campus-developments/projects/spark
eriez.com

AI-POWERED WEEE AND METAL SORTING

In January this year, SWEEEP Kuusakoski and Recycleye announced the first successful commercial application of AI computer vision in detecting and sorting WEEE (Waste Electrical and Electronic Equipment) in the UK.

According to the two companies, this announcement would bring the use of artificial intelligence for automated sorting to WEEE and metals, "which although is increasingly being used to sort household waste, has not yet been widely applied to WEEE or metals". SWEEEP Kuusakoski specializes in the recycling of waste electrical and electronic equipment. Recycleye is a technology company bringing AI-powered automated sorting to waste and materials management. Together, the companies deployed an optical sorter that uses AI and machine learning to sort e-waste for recycling.

As underlined by Recycleye, integrating the technology with AI rather than NIR is novel to this application. "Using AI to detect objects means they are identified by a range of visual features, just like a human eye, rather than by purely color and light-based sensors," the information said. "In WEEE, this means that the new technology can detect PCBs compared to other pieces of metal and plastic, so precious metal content can be extracted for recovery. Historically, existing optical sorters have struggled to identify PCBs accurately when broken into small fractions, and so AI-powered ejection is now equipping metal recyclers like SWEEEP with new capabilities."

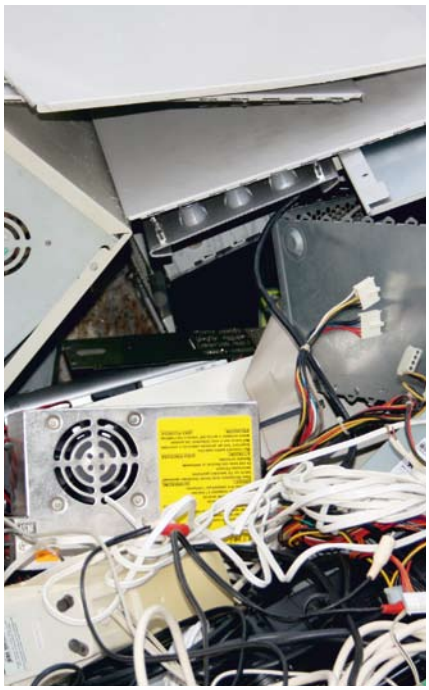


Photo: O. Kürth

Similarly, the multi-material nature of batteries would make them difficult to detect with NIR, and is often a manual task. "Yet, AI has the potential to detect and eject batteries based on visual features, reducing the risk of ignition during the recycling process."

Recycleye's AI-powered optical sorter is installed at the back-end of the SWEEEP Kuusakoski plant in Sittingbourne (Kent), sorting between higher value items with precious metal content (namely copper, PCBs, cables and brass) and lower value materials (such as aluminum, plastics, steel, ferrous metals and batteries). By ejecting the lower value materials through AI-powered detection, the system was cleaning up the plant's valuables line to support purer waste streams. "This installation to sort SWEEEP's shredded e-waste is the first time that Recycleye has combined its AI with an air jet system and marks the first step that the innovative companies are taking together in evaluating the impact of AI on WEEE sorting," the technology company Recycleye pointed out.

recycleye.com
sweeepkuusakoski.co.uk/

LYONDELLBASELL'S ADVANCED RECYCLING PROJECT GETS EU GRANT

International chemical company LyondellBasell (LYB) has been selected to receive a 40 million Euro grant from the European Union (EU) Innovation Fund.

The money is to support the fully-electrified, industrial-scale advanced recycling demonstration plant the company plans to build at its Wesseling site in Germany. LYB's MoReTec plant is one of the 41 projects selected in the EU Innovation Fund 'Third Call for Large Scale Projects'. The EU is committing 3.6 billion Euro as part of its efforts to fund innovative clean-tech projects to support decarbonization. As reported by LyondellBasell, the MoReTec demonstration plant in Germany, which is expected to be started-up in 2026, will convert post-consumer plastic waste into feedstock for the production of new plastic materials to be offered under the company's CirculenRevive brand. After completion, it is planned that the facility will have an annual processing capacity of about 50,000 tons, equivalent to the amount of plastic packaging waste generated by over 1.2 million German citizens per year.

Investment decision in November

In November last year, LyondellBasell informed about the final investment decision to build the company's first industrial-scale catalytic advanced recycling demonstration plant in Germany. According to schedule, construction work will be completed by the end of 2025.

"We are committed to addressing the global challenge of plastic waste and advancing a circular economy, and today's announcement is another meaningful step in that direction," Peter Vanacker, LYB CEO, was cited. "Scaling up our catalytic advanced recycling technology will allow us to return larger volumes of plastic waste back into the value chain. By doing this, we will have the ability to produce more materials for high-quality applications, retaining value of plastics for as long as possible."

The LYB MoReTec demonstration plant would close the gap for difficult to recycle plastics, the firm underlined. "Source One Plastics, a joint venture of LYB and 23 Oaks Investments formed in October 2022, will supply the majority of the processed plastic waste feedstock. The advanced recycled feedstock produced by the MoReTec facility will be used for the production of polymers sold by LYB under the CirculenRevive product line for use in a wide range of applications, including medical and food packaging."

The MoReTec technology produces pyrolysis oil and pyrolysis gas. "Pyrolysis oil is a substitute for fossil-based materials used in polymer production," LYB explained. "Typically, pyrolysis gas streams are consumed as a fuel, however, the MoReTec technology enables the pyrolysis gas to be recovered as well, contributing to the production of polymer and displacing fossil-based feedstocks, which reduces CO_2 emissions. " In addition, the proprietary catalyst technology would lower the process temperature, reduce energy consumption and improve yield. "With lower energy consumption, the process can be powered by electricity, including electricity from renewable sources."

By this way, also the carbon footprint can be improved. "The recovery of pyrolysis gas as feedstock, lower energy demand, electrical heating design, displacement of fossil-feedstocks, and recovery of waste plastic from incineration or landfill result in a lower carbon footprint compared with fossil-based processes. This makes MoReTec a unique value proposition," LyondellBasell is convinced.

lyondellbasell.com/en/

The Wesseling, Germany, complex is LyondellBasell's largest manufacturing facility in Europe

Photo: LYB

NEW TEXTILE RECYCLING LINE IN ITALY

Because of the growing demand for sustainable fibers in the re-spinning and nonwoven industries, Italian company Sfilacciatura Negro Biella decided to expand its recycling capabilities and ordered a tearing line from Austrian manufacturer Andritz.

Designed for processing post-consumer textile waste with automatic removal of hard parts, the new tearing line supports the company's expansion into new recycling segments, Andritz informed. Sfilacciatura Negro has extensive experience in recycling industrial textile waste and already operates two tearing lines.

According to the provider, the new generation recycling line results from ten years of close cooperation, trials in its technical center, and visits to customer lines in Spain and Portugal.

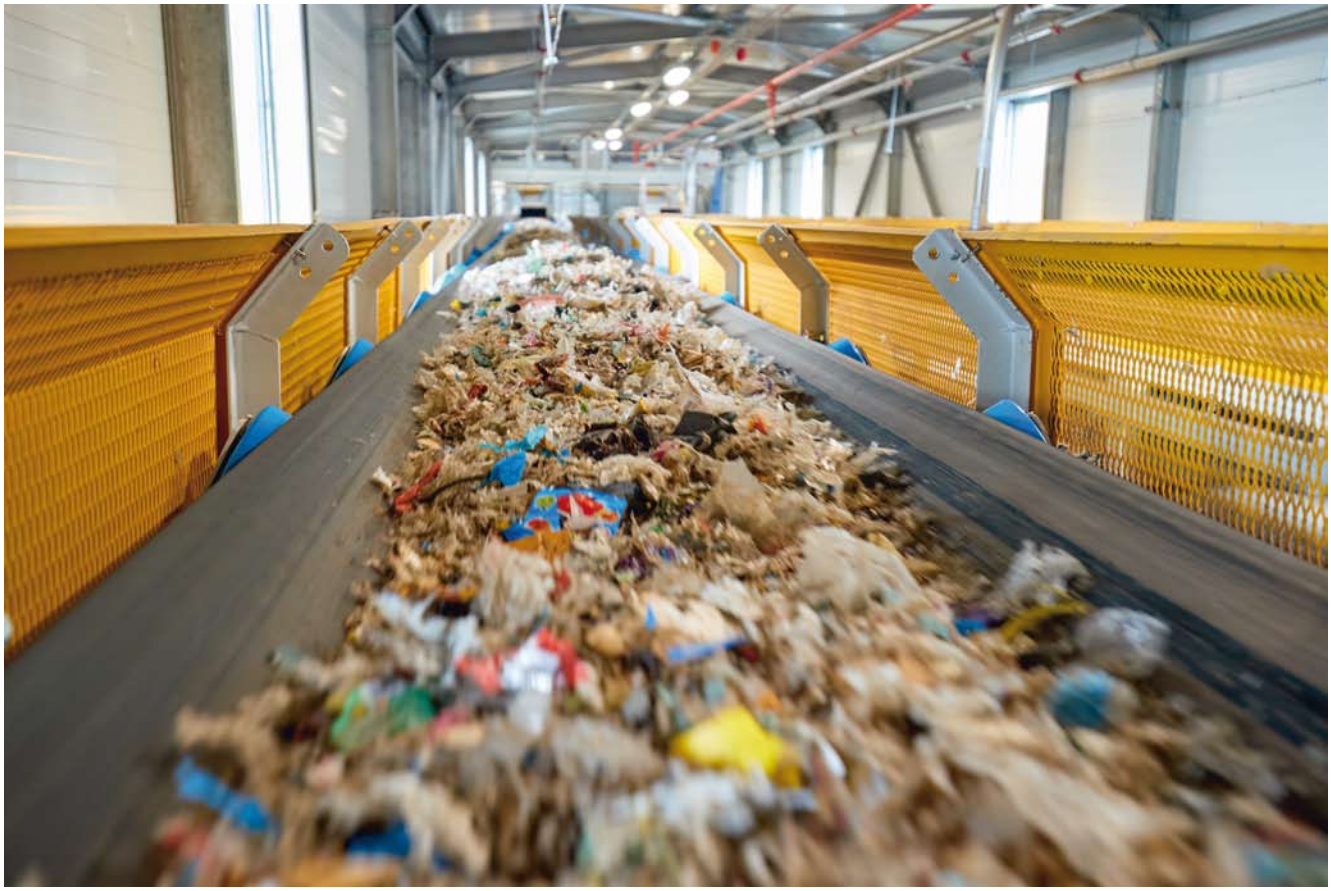
Andritz Laroche project team with Alessandro Giana, co-owner of Sfilacciatura Negro in front of the new generation Exel line

Photo: Andritz

Automated filtration unit

The complete line from the feeding of sorted waste bales to baling of the recycled fibers "is designed for highly efficient, energy-saving operation and features automated separation of hard points while maintaining a very good material yield. An automated filtration unit is provided for airflow and dust management. Only one operator is needed to manage the entire line up to the recycled fiber baler." The baler can produce film-wrapped and tied bales with a weight of up to 350 kilograms, Andritz stated.

andritz.com



WASTE-TO-ENERGY TECHNOLOGY IN AFRICA IS GROWING

Africa is hungry for energy. But according to the World Economic Forum, the energy generation capacity of the entire African continent (excluding South Africa) in 2021 was only 28 Gigawatts – equal to the Argentinian potential. Is the waste-to-energy technology able to deliver solutions?

In 2018, the African Union set itself the ambition that "African cities will recycle at least 50 percent of the waste they generate by 2023". But in February 2023, the United Nations Environment Programme gave account that "an estimated 70 to 80 percent of the MSW generated in Africa is recyclable, yet only four percent of MSW is currently recycled". A paper on "Potential of Waste to Energy in African Urban Areas" written by Emmanuel Anosisye Mwangomo makes clear that in 2025, there will be enough waste for energy recovery in Africa: 244,303,000 tons per year of waste generated and 167,525,000 tons per year collected. The potential energy recovery from waste generated for incineration and for landfills was indicated as 2,198,724 (Terrajoule, TJ) and 529,813 TJ, respectively per year, while waste collected for burning and for landfill gas recovery added up to 1,507,728 TJ and 363,244 TJ per year respectively. Back to reality: In 2019, the newspaper Africa Report notified that "to date, only one WtE developer of note has successfully constructed and started operating a major waste-fed power project in Africa".

Existing or in the pipeline

Disregarding this plant – Reppie in Ethiopia – there are several biogas facilities or other municipal solid waste-fed plants in Africa, existing or in the pipeline. For example,

Photo: Martin Mecnarowski / stock.adobe.com

the 2.4-megawatt (MW) Gorge Farm Anaerobic Digestion Power Plant in Naivasha, Kenya, runs on vegetable and flower waste. According to ESI Africa, a 400-kilowatt (kW) Hybrid-PV-Biogas-Pyrolysis plant – the first for Ghana – is planned to convert 12 tons of waste into bio-fertilizer and energy daily. The medium-scale power plant combines 200 kW energy from solar, 100 kW from biogas and 100 kW from the pyrolysis of plastic waste. The Bronkhorstspruit Biogas Plant in South Africa, carried out by Bio2Watt Ltd, is the first industrial-scale waste-to-energy facility on the continent. The plant – investment costs 38.5 million US-Dollar – is built to produce biogas from the fermentation of organic waste. The 240.000 tons of organic waste deliver biogas to be combusted and used to generate electricity. In South Africa, in 2025, the state-of-the-art biogas plant will be built to convert organic waste into biogas and then to electricity for Cape Town. In Zimbabwe, the planned solid waste-fired thermal Bulawayo Waste-to-Energy power plant is expected to convert solid waste into biodiesel and biogas to generate electricity.

6 of 17 LFGE projects realized

These few examples give an impression of the different approaches, but also of the multiple, if not unique, interest of several African actors to exchange waste with energy. But it is too early to speak of a general transition. In the Republic of South Africa (RAS), for example, not even the state of landfill gas to energy is prioritized by the government. A scientific paper on "Waste-to-energy in a developing country" shows that the country continues to invest in coal-fired power stations, "owing to the abundance, availability, and low costs of coal reserves, which will supply coal for the next 200 years". In spite of some progress in the utilization of landfill gas and 17 planned landfill gas to energy (LFGE) projects, six are operational generating 15 MW of electricity and three were decommissioned due to technical problems. The paper specifies several reasons why the implementation of LFGE projects was "progressing under a slower rate": lack of waste data, lack of public awareness, lack of funding, high capital and operating costs, too little institutional capacity, the tedious and complex tender process and similar the registration under the Clean Development Mechanism. And: "Utilizing WtE technology such as LFGE in Republic of South Africa to manage waste is not attractive, because the costs of LFGE are relatively higher compared to conventional technologies". The RES4Africa Foundation adds another obstacle: "Aging grids and a lack of infrastructure are slowing down progress in Africa."

Successful: Reppie

On the contrary, the before-mentioned waste-to-energy-plant Reppie in Ethiopia is "successfully constructed and started operating a major waste-fed power project in Africa", the newspaper Africa Report wrote. The Koshe-Reppie Waste to Energy plant results of a partnership between the Government of Ethiopia and a consortium of international companies: Cambridge Industries Limited (Singapore), China National Electric Engineering and Ramboll, a Danish engineering firm, the UNEP put out. (Another source means that Ethiopian Electric, being advised by Ramboll, is the third partner.) Reppie is a 120 million US-Dollar project (another source says 95 million US-Dollar, a third 118), needs a feedstock of about 1,400 tons per day, waste is combusted at a minimum temperature of 850°C, the plant is established to generate 185 GWh electricity per year, a world class Flue Gas Treatment is planned, and information on the plant's pollutant emissions was said to be published in real-time. Massreshaw Assnakew Abebe wrote that in an article on "Challenges of Waste to Energy Facility in Reppie". He did not hide that the plant has to handle leachate from storage, dispose of unusual wastes and residual ashes, generate wastewater and release exhaust gases as well as noise emissions. (And he forgot to mention that hundreds of waste pickers lost their jobs.)

However, the United Nations Environment Programme recommended the plant as "a first in Africa". Zerubabel Getachew, Ethiopia's deputy permanent representative to the United Nations in Nairobi, saw the project as "just one component of Ethiopia's broader strategy to address pollution and embrace renewable energy across all sectors of the economy". And he added: "We hope that Reppie will serve as a model for other countries in the region and around the world."

A fundamentally wrong technology?

Fraol Alemu, a Graduate Student at the Ethiopia Hawassa University, disagrees. In his opinion, the Reppie plant "failed". He argues that African countries would need small-scale incinerators to handle hazardous waste generated in medical and industrial processes, for example. He assesses incineration for energy a "fundamentally wrong and misplaced choice of technology" for the domestic waste consisting of 60 to 75 percent biodegradable material. And for the same amount of money, "the Addis Ababa city administration could have had an efficient Integrated Solid Waste Management System that would have created thousands of jobs". For GAIA, the Global Alliance for Incineration Alternatives, Ethiopia's approach to its trash problem is "wrong-headed" and waste-to-energy has no place in Africa in principle. GAIA relates to UNEP and the International Solid Waste Association (ISWA). According to them, "waste incineration is especially unfeasible for low- and middle-income countries due to its cost-prohibitive nature and unsuitable waste composition".

An effective means of treating

Nevertheless, in its latest White Book on Energy-from-Waste Technologies, ISWA declared: “Waste thermal treatment is a clean and compact technology that can be adopted in the central areas of cities.” UNEP has also accepted specific waste incineration: “Thermal WtE has received considerable attention in developing countries due to its potential benefits for energy generation and reducing waste volume. Globally, more than 200 thermal WtE plants are currently under construction and will be operational between 2020 and 2023.” The International Atomic Energy Agency (IAEA) in 2019 took sides with WtE: “In the long term, poor access to energy and electricity services hampers development prospects and the weakness of sub-Saharan power grids represents a significant cost for national economies. Waste-to-energy plants appear as an effective means of treating these two problems as one.”

Only 0.6 percent of global investment

No rose without thorns; not all WtE-technologies are applicable. The before mentioned “Potential of Waste to Energy”-paper points out that apart from environmental aspects, there must be some attention paid to technical and some socio-economic facts. Waste-to-Energy projects with its technology require “high skilled technical expertise for both operation and maintenance” that, in most cases, must be imported from countries outside Africa. The technique requires “high investment, operation and maintenance costs” that must be compensated through electricity for sale.

The previous financial support of the African or – more precisely – the sub-Saharian Africa energy sector leaves much to be desired. The continent is facing rapidly growing energy demand, critical energy access gaps, and an imperative for development, according to a comprehensive brochure titled “Africa’s Energy Future is Renewable” and edited by the RES4Africa Foundation. Instead, in 2021 only 0.6 percent of renewable energy investment or 2.6 billion US-Dollar went to Africa, while global investment reached record-high levels of 434 billion US-Dollar.

Interest raised significantly

Anyway, the prospects of the branch are promising. As the RES4Africa Foundation-paper underlines, “the renewable energy sector has the potential to create vast employment opportunities across the value chain”. It is “expected to grow from 300,000 jobs today to up to 8 million jobs by 2050”. These numbers might be too speculative. But in the opinion of Waste to Energy International (WTEI), a team of international environmentalists, engineers, economists and project developers, “the outgoing 2021 was marked by a rapidly increasing activity in waste to energy in Africa: new trends inspired several recent projects. It looks like the continent’s general interest in waste-to-energy rose significantly. A number of countries expressed their desire to have incineration and pyrolysis.”

The “African Business Guide” paper is also convinced that, in any case, the waste business is “profitable”, as the potential of recyclable material is “increasingly recognized” and local recycling branches are developing.

Private investors are asked

According to the “African Business Guide”, released by Mittelstand Global, Germany Trade & Invest and the German Ministry of Economy and Climate Protection, “there is a lack of modern technology, know-how and in many cases financial facilities. The communities need one fifth of their budget solely for their waste disposal. That is why international disposer and private investors are asked. German entrepreneurs are already active in the waste branch and water sector. In the future, the demand on the continent will probably grow further and, likewise, the chances for German entrepreneurs.”

If German or not: Of course, each new waste-to-energy plant is a custom-made product developed for the particular requirements of the country, population, energy demand, technical infrastructure, funding, site, catchment, waste materials and more. In any case, the following advice needs to be noted: “It helps to have investors who understand the WtE market.”

Foto: Harald Heinritz / abfallbild.de

COOPERATION FOR THE SUSTAINABLE PRODUCTION OF SILICON CARBIDE

ESK-SIC GmbH, a market leader in silicon carbide (SiC) materials, and Kyocera, a global technology company specialized in manufacturing technical ceramics and semiconductor technologies, announced that they have entered a strategic partnership.

ESK-SIC and Kyocera have defined developing solutions for the sustainable production of silicon carbide and the associated products as the goal of their collaboration. By-products and end-of-life ceramics would be recycled using RECOSiC technology to produce raw materials specifically tailored to various end applications. “Compared to currently available SiC raw materials on the market in terms of material science aspects, while minimizing the carbon footprint of the process, the RECOSiC recycling technology brings a technological upgrade,” the press release said.

In line with Kyocera, the partnership between both companies aims to improve the efficiency and sustainability of the entire silicon carbide value chain. This would involve developing new manufacturing technologies, optimizing production processes, researching innovative applications and establishing circular economy principles for recycling SiC materials.

Silicon carbide is recognized as a key material for a wide application range in various industries, including the branches electronics and automotive industries as well as energy supply. “The unique properties of SiC, such as extreme hardness, good thermal resistance and low wear, make it an indispensable material in modern high-conductivity applications.”

kyocera-fineceramics.de/en

Using RECOSiC Technology reduces the carbon footprint of the process

Photo : Fraunhofer IKTS/Kyocera

WASTE-TO-ENERGY BOOM TAKES A BREAK – BUT NEW MARKETS ARE ON THE HORIZON

As per a German-based consultant firm and provider of market intelligence ecoprog, the market for thermal waste treatment plants is set to grow further. The company has published the 16th edition of its annual study on the global Waste-to-Energy (WtE) sector.

As stated by the market research firm, new project awardings in China and the UK are declining. ecoprog expects large parts of the UK's WtE market to become saturated by around 2026. While these former boom markets are moving towards a soft landing, other countries in Asia, Europe and the Middle East show significant potential for the future.

Today, more than 2,700 thermal treatment plants are in operation worldwide, with a combined capacity of about 530 million tons of waste per year. ecoprog estimates that more than 3,000 plants with a capacity of more than 700 million tons will be in operation by 2032.

Asia

China has seen a steady decline in new project awardings in recent years. That is partly due to the slowing economy, and material recycling of waste is becoming more important in China. As of 2023, the country's capacity target for 2025 of 292 million tons per year has already been exceeded, but the market is not yet saturated. ecoprog expects the Chinese thermal waste treatment sector to experience a soft landing in the coming years, with new capacities declining steadily to 4.8 million tons in 2032.

Other promising markets in Asia, such as Thailand, Indonesia, and India, are not yet able to absorb the market slump in China. Amongst other reasons, this is due to insufficient financial and regulatory support from governments in most of these countries. Nevertheless, even if many projects in these new WtE markets fail, the number of realized projects still increases, ecoprog informed.

Europe

In the UK, the long-standing boom in new project awardings has slowed down noticeably in 2023. Large parts of the UK's WtE market will become saturated by around 2026. However, while the European market is still being dominated by the development in the UK, several other European countries show a significant market development as well. These include countries such as Poland and the Czech Republic, but some projects also emerge in traditional WtE markets, like Italy and France. In the established markets, maintenance and retrofits are becoming increasingly important.

About the Market Study "Waste-to-Energy"

According to ecoprog, its "Waste-to-Energy" study is the industry's leading standard work. It includes a forecast of the global market development by country until 2032 and contains data on more than 3,600 waste treatment plants and projects. Moreover, it analyses market factors, trends and support schemes for the 50 most important national markets and worldwide.

Increasing commercial potential

In addition, further new markets will emerge or continue to grow in the future. That includes the Americas, with Brazil in particular. ecoprog also sees a growing market potential in the Middle East, especially in economically stronger countries, such as Saudi Arabia and Kuwait.

As underlined by the company, taxation regarding carbon dioxide is an increasingly important issue for the WtE industry. "CO_2 pricing directly increases the cost for waste incineration, and this, if not accompanied by higher landfill taxes, could contradict efforts to stop landfilling. In Europe, it can be expected that the EU will require the WtE sector to pay for the fossil CO_2 within the European Emission Trading System. However, introducing CO_2 taxes could also create new opportunities for the industry, most prominently through carbon capture and storage (CCS) or utilization (CCU). Thus, in 2023, several new carbon capture projects have emerged at existing or planned facilities in Germany, Denmark, Finland, the UK, and the United Arab Emirates."

■ The new market report "Waste-to-Energy 2023/2024" is available at ecoprog.com/publications/data-wte

Photo: Zweckverband Abfallwirtschaft Raum Würzburg / abfallbild.de

GHANA AND ITS WASTE MANAGEMENT

The Republic of Ghana is on the road to circular economy.

In 2021, the West African country had more than eight million households. The daily produced quantity of solid waste was estimated at nearly 12,710 tons. Only ten percent of this amount was collected and treated appropriately.

As of 2021, over 3.1 million households disposed of solid waste at public dumps or open spaces, global data and business intelligence platform Statista informed in February 2023. “Other households threw away solid waste by burning them or sending them to central collection containers and compaction trucks. These were the primary methods by which solid waste was disposed of in the country.”

But the situation is changing. Ghana has begun policy, institutional and regulatory frameworks for sound management of solid waste, Dr. Kwaku Afriyie, Minister of Environment, Science, Technology and Innovation, and Angela Lusigi, UNDP (United Nations Development Programme) Resident Representative in Ghana, reported on the organization’s homepage in October 2022. The republic had developed a solid waste management strategy to set the country “on a path towards progressive, high-quality, cost-effective and sustainable waste management services which deliver environmental, public health, and economic benefits to all”. That would be a step in the right direction in view of the scale and speed of urbanization.

“Institutional governance mechanisms support collaboration to address waste management challenges,” the authors wrote. “At the national level, the Ghana National Plastics Action Partnership has developed the National Action Roadmap to guide ways to manage plastics across the product lifecycle.” They also informed about the Waste Recovery Platform (https://ghanawasteplatform.org) established by UNDP together with those in the waste manage-

Photo: jozuadouglas / pixabay.com

ment value chain to promote waste recovery in a larger circular economy. “In the spirit of leaving no one behind, the platform convenes and integrates the interventions of the government, private sector, and waste entrepreneurs as well as waste pickers, the majority of whom are women and young people. The platform is working together with partners to unblock challenges in the sector by supporting innovation and entrepreneurship.”

Extended Producer Responsibility

The Ghana Ministry of Environment, Science, Technology and Innovation (MESTI) is preparing an Extended Producer Responsibility (EPR) framework where importers and local manufacturers share the management and cost burden for end-of-life products. “In this way, funds will be generated to effectively manage waste in the cities,” Dr. Kwaku Afriyie and Angela Lusigi pointed out. “Through public-private partnerships, innovators in the sector are already being supported through grants and loans to develop home-grown solutions to efficiently manage waste.”

Soon, the proposed law is to replace the existing voluntary system, African media reported. Regarding plastic packaging, it would oblige producers to take charge of the waste generated by their activities. The goal is to reduce pollution in the West African country, where the production of plastic waste – according to estimations – amounts to 840,000 tons a year. This responsibility would require the establishment of collection and recycling centers for used plastics. As underlined, the aim is to increase collection rates and promote recycling.

Regarding e-waste, EPR could also be a solution, according to Stephen Kansuk and Eugenia Yayra Agbley from UNDP Ghana. They reported that e-waste activities in Ghana provide 105 to 268 million US-Dollar in yearly revenue and serve as a source of livelihood to at least 200,000 people nationwide. However, the activities often had adverse socio-economic and environmental impacts.

Ghana has already taken steps concerning sustainability. In 2016, the country launched the Hazardous and Electronic Waste Control and Management Act (Act 917) and its accompanying legal instrument (LI 2250). As emphasized by the authors, Ghana was the first African country to launch the Technical Guidelines on Environmentally Sound E-waste Management. “These frameworks indicate Ghana’s commitment to guide sustainable e-waste management and recycling in the country,“ Stephen Kansuk and Eugenia Yayra Agbley wrote in September last year. “Although, the government has made some efforts to improve e-waste management, more deliberate and strategic interventions will help position Ghana to sustainably harness the benefits

Ghana’s Economy

With – estimated – more than 34 million inhabitants, Ghana is the second-most populous country in West Africa. The capital and largest city is Accra; other cities are Kumasi, Tamale, and Sekondi-Takoradi. According to the African Development Bank Group, the economic outlook for Ghana is not too bad, although there are uncertainties. As reported last year, the group projected the country’s growth of gross domestic product (GDP) to fall to 1.7 percent in 2023 and to recover to 3.0 percent in this year, in line with global demand trends. After 2024, the Worldbank expects the country’s economy will recover to its potential growth by 2025.

Regarding climate change issues and policy options, Ghana’s Green Growth Index is estimated at 51 percent, or about halfway to its green growth target. “This indicates that with the right green growth policies and strategies, Ghana could achieve economic growth while reducing vulnerability and building resilience to climate change,” the African Development Bank Group stated. That would require boosting financing from public and private sources.
An estimated 1.9 billion US-Dollar a year in financing would be needed to meet the country’s Nationally Determined Contribution.

The main source of climate finance has been the public sector, which contributed 100 million US-Dollar leaving a gap of 1.8 billion US-Dollar a year for 2020–30, the bank group pointed out. The private sector has the potential to raise climate finance equivalent to 8.8 percent of GDP. “The government is exploring practical solutions to close the financing gap, including private equity, carbon markets, and climate impact bonds. It is also working on policies and regulations to enable participation in the global climate finance market. Ghana could explore ways of attracting sovereign welfare and pension funds. Factors constraining private climate finance include risks and barriers associated with inadequate regulations. Natural capital (renewable and nonrenewable) increased slightly between 1995 and 2018, suggesting the potential to leverage private finance with natural capital.”

of e-waste." They propose EPR policies "to hold importers and manufacturers responsible for the afterlife of Electrical and Electronic Equipment (EEE) sold out to customers". The argument: The country's industry is confronted with many illegal entries of decommissioned electrical and electronic equipment; EPR policies could help minimize illegal imports by requiring licenses for e-waste disposal. Furthermore, recycling facilities should be established and equipped adequately to guarantee thorough adherence to proper recycling practices. Finally, yet importantly, issues surrounding e-waste should be assimilated into urban planning efforts for the appropriate designation of disposal sites.

Ghana Circular Economy Center

In 2022, the United Nations Industrial Development Organization (UNIDO), Global Affairs Canada and the Government of Ghana – through MESTI – launched the Ghana Circular Economy Center Project to support the country's transition to a circular economy. The transition "requires a systemic approach, with focus on the broader enabling conditions, including strong regulatory frameworks, institutional coordination mechanisms, technology transfer, the build-up and sharing of knowledge and intelligence, capacity building, and awareness of the principles and practices of circularity within various value chains," the press release said. According to the information, the project was to be implemented by UNIDO over five years in coordination with MESTI with funding from Canada (7.5 million Canadian Dollar or approximately six million US-Dollar). It seeks to promote circular economy-based and inclusive business models, particularly among women and the youth, while finding innovative ways to reduce negative environmental impacts. "Ultimately, the project will improve the ability of entrepreneurs, particularly women, the youth and those within the informal sector, to access resources and technologies that would enable them to identify, design, develop and scale up circular economy business models."

Business opportunities

As reported by the state-owned Ghana News Agency (GNA) in March last year, the Ghanaian government "is wooing investors and industries" to see the 2.4 billion US-Dollar financing needed to transition Ghana from a linear to a circular economy "as a huge investing and business opportunity". In a seminar organized by the European Union in partnership with Ghana's Ministry of Environment, Science, Technology, and Innovation, Minister Dr. Kwaku Afriyie informed that the West African country had developed a Circular Economy Transition Roadmap and Action Plan over ten years "with investment and business opportunities in plastics, electronics, agriculture and food, textiles, built environment, water and waste". At that time, Roadmap and Action Plan were in the implementation phase. According to the information, he urged investors and industries to channel funds and operations into those areas, "which would give them assured good returns while creating sustainable jobs for the youth, and supporting economic resilience and national development".

The country has an organization committed to facilitating and promoting investments: the Ghana Investment Promotion Center (GIPC). It is "the primary agency responsible for attracting and promoting investment in Ghana under the Office of the President" one can read on its homepage. Based on the GIPC Act 2013 (Act 865), the center's mandate is "to encourage and facilitate valuable investments that drive economic growth, unlock opportunities, and create employment".

■ As underlined, the GIPC is the first point of contact for foreign investors. For more information, see gipc.gov.gh. Tenders can be found at tenders.ppa.gov.gh/tenders.

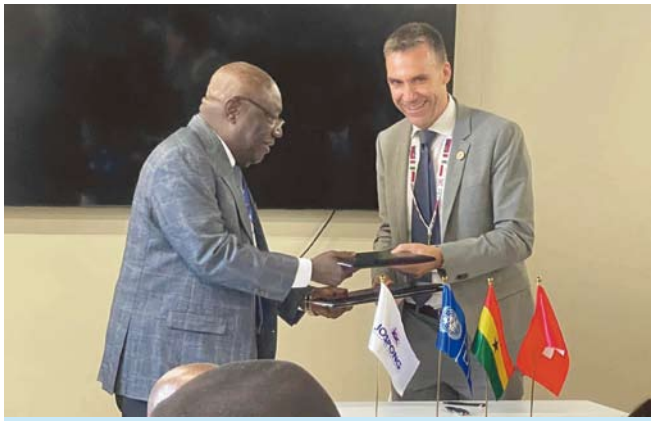
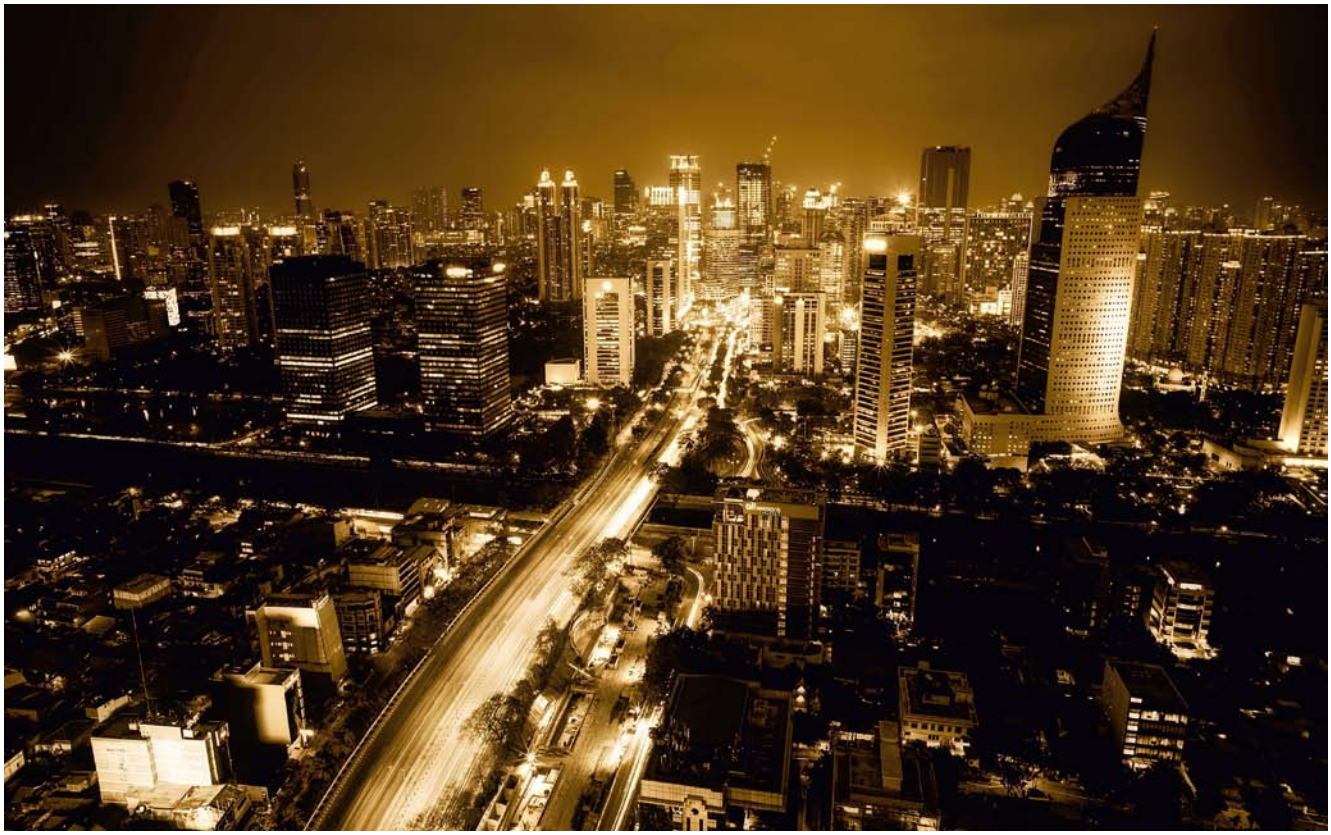


Photo: Ghana, Ministry of Environment, Science, Technology, and Innovation

Ghana Authorizes ITMO for Waste Recycling

In December last year, during COP28 in Dubai, Ghana's Minister of Environment, Science, Technology, and Innovation, Dr. Kwaku Afriyie, officially authorized the international transfer of mitigation outcomes (ITMO) for integrated waste recycling and compost facilities. Internationally Transferred Mitigation Outcomes (ITMO) are units from the new mechanism for the international emissions trading between Parties to the Paris Agreement. The authorization letter was signed in collaboration with the Swiss Federal Government, represented by Ambassador Felix Werti.

mesti.gov.gh
emissions-euets.com/carbon-market-glossary/2097-internationally-transferred-mitigation-outcomes-itmo



Chinaplas 2024: PACKAGING AND AUTOMOTIVE SECTORS SPUR DEMAND

According to the organizers of this year's trade fair Chinaplas 2024, Indonesia is on its way to a lucrative market for plastics. Their market report can be read here:

The industrial sector of Indonesia has been contributing to its overall economic growth, regardless of the upward momentum of its production in terms of volume and value in the past few years. Government incentives to investors, favorable business environment, significant improvement in technologies and skilled manpower are among the factors that encourage the expansion of industrial sector. In particular, the plastics industry in Indonesia is exhibiting sustained growth in the next few years owing to rising demand spurred by increasing consumer expenditure.

With a population of 277 million, Indonesia has become an attractive consumer market, and due to the fast-paced changing lifestyles of buyers with higher disposable income, manufacturers are focused on meeting the requirements by building their production capabilities. Indonesia's plastics market size was valued at 8.63 billion US-Dollar in 2022 and is likely to reach 14.58 billion US-Dollar by 2031, expanding at a CAGR (compound annual growth rate) of six percent during the forecast period 2023–2031, according to the projection by Growth Market Reports. Several important industries are crucial to Indonesia's plastics industry – packaging, automotive and medical are experiencing rapid development.

Packaging sector takes major leaps towards circular economy

Indonesia's packaging industry remains the major application of plastics. A report of Global Data states that the country's packaging market size, valued at 151.3 billion units

Photo: 12019 / pixabay.com

in 2022, is poised to register a CAGR of more than three percent during the period 2022-2027 with flexible packaging segment dominating the market share until 2027.

From a linear model, Indonesia's packaging industry is fast moving towards a circular economy. That has been made more pronounced by the investments of leading companies into areas that will reduce, recycle and re-use plastics. As an economy battling huge plastic waste stockpile reaching 18.99 million tons per year based on Environment and Forestry Ministry data, Indonesia has placed circular economy as its main focus by implementing 'Golden Indonesia Vision 2045', which is the long-term national development plan. Thus, the utilization of recycled materials has become the goal of many Indonesian companies that plan to go through the route of circular economy. This has brought huge opportunities to companies supplying advanced recycling solutions and sustainable materials. This has also opened new horizons to both Indonesian and foreign companies operating in Indonesia and a number of significant ventures into plastics manufacturing have been launched in the country's various industrial centers.

Coca-Cola in Indonesia has launched its new packaging made of 100 percent recycled PET (rPET), excluding caps and labels, in line with the vision of 'World Without Waste'. Coca-Cola operates a recycling plant, Amandina Bumi Nusantara, located in Cikarang. The facility, with a capacity of 25,000 tons of PET per year, is a partnership between Coca-Cola Europacific Partners Indonesia and Dynapack Asia. The production of bottles with 100 percent rPET content aims to accelerate the goal of reducing the use of conventional plastics and lowering carbon emissions.

Another development is the signing of the partnership agreement between Indonesian plastic recycler, Pan Era Group, and Milliken & Company, which represents another milestone in the industry. The partnership combines Pan Era Group's expertise in the collection and production of recycled PP plastic resin with Milliken's additive technology solutions. Pan Era Group and Milliken will collaborate to promote a circular economy in Indonesia by utilizing Pan Era Group's extensive local collection network to collect plastic waste and coupled with Milliken's material science technology to produce recycled polypropylene resin. Further, this collaboration aims to improve the performance of transparent recycled PP resin and increase its market presence.

Investments in materials for the packaging industry continue to pour into Indonesia, stressing its major role in the ASEAN (Association of Southeast Asian Nations) region's

Photo: CHINAPLAS/Adsale Exhibition Services

broad consumer market. BASF invested in the capacity expansion of polymer dispersions at its production site in Merak, Indonesia. The expansion is in line with the growing trend of high-quality packaging in ASEAN. It aims to bring additional supply to fulfill the growing demand for acrylics and styrene-butadiene dispersions in the Southeast Asia, Australia, and New Zealand markets. With proximity to the supply of key raw materials and the flexibility of producing both acrylic and styrene-butadiene dispersions, Merak is a crucial supply point to ensure stable production of paper coatings.

CJ BIO, a division of South Korea-based CJ CheilJedang, is now manufacturing polyhydroxyalkanoate (PHA) at its facility located in Pasuruan, Indonesia. CJ BIO uses its facility to enter the biomaterials sector with the goal of creating opportunities to reduce the impact of manufactured plastics on the environment. The plant has a rated capacity of 5,000 metric tons and focuses exclusively on manufacturing 'amorphous' PHAs (a-PHAs). Amorphous PHA is a softer, more rubbery (low glass transition temperature [Tg]) version of PHA that offers fundamentally different performance opportunities from crystalline or semi-crystalline forms of PHA. This material will impose immediate use as a modifier to other polymers and biopolymers to improve functional characteristics and biodegradability, enabling 'cradle-to-grave' solutions for the broad range of markets that generate plastic waste.

E-mobility trend spurs automotive production

Indonesia has gained the importance as an automotive center in the region with a growing number of companies engaged in this sector that are setting up their operations in the country. The country's automotive companies are increasingly focused on launching electric vehicles, along with meeting trends such as lightweighting and enhanced safety and autonomy, bringing the dramatic demand for automotive plastics. Engineering plastics for the automotive industry are predominantly imported, but an increasing number of local manufacturers are improving their portfolio through partnerships with foreign companies. It has been estimated that Indonesia's automotive industry players will need around 200,000 tons of plastics yearly with less than half supplied by domestic companies.

Chinaplas 2024 – according to the organizers, one of the most prestigious international plastics and rubber trade fairs – will be held at the National Exhibition and Convention Center (NECC), Hongqiao, Shanghai (People's Republic of China) from April 23-26, 2024. The show would gather over 4,000+ international exhibitors under one roof and welcome visitors from all around the world to grasp business opportunities generated from the economic recovery, the information said.

As underlined, China has granted visa-free entry to citizens from France, Germany, Italy, the Netherlands, Spain, Malaysia, Thailand, Switzerland, Ireland and Singapore. Furthermore, the country has also introduced new measures to simplify visa processes, making the trip to Chinaplas easier and more convenient. The trade fair would be ready to accommodate more international visitors in Shanghai.

The online pre-registration to Chinaplas 2024 (chinaplasonline.com/CPS24/preregistrationlanding/eng?Regsource=CPSOL24MNPRV) is open till April 17, 2024, 1700 (GMT +8). All visitors are required to pre-register and reserve the entry dates in advance for admission correspondingly (admission ticket at 50 Renminbi or 7.5 US-Dollar). Pre-registered visitors shall receive their Visitor eBadge (for local visitors) or eConfirmation Letter (for overseas visitors). Admission tickets are available on a first-come, first-served basis.

The bright prospects for plastics in Indonesia's automotive will be sustained by major foreign and domestic players. Leading automotive manufacturers with production facilities in Indonesia include Hyundai, Isuzu, Toyota, Daihatsu, Honda, Chery Motor, Wuling Motors and others. Local car manufacturers include Esemka, Fin Komodo, Tawon, Marlip, etcetera. Investments in Indonesia's automotive industry have been on the rise, attracted by the large consumer base and excellent infrastructure.

EVs (electric vehicles) will dominate innovations as seen by focus of manufacturers. PT Neta Auto Indonesia (NAI), which introduced the Chinese-made Neta V electric car, announced its plan to build an assembly plant in Indonesia with local company PT Handal Indonesia Motor. The intention is to have Neta V model locally assembled in Indonesia in the form of completely knocked down (CKD). Another car manufacturer, Wuling Motors Indonesia launched the Wuling Bingo EV, its second electric vehicle EV model after the Air EV. The Bingo model is offered in two variants in Indonesia. Wuling Indonesia earlier unveiled its first EV, the Air EV as part of its bid to be a leading new energy automobile company worldwide. The first global launch of this model was held in Indonesia. Aside from Wuling, there are other Chinese EV manufacturers expressing their interest to produce their models in Indonesia seeing the government's favorable policy on EVs. The Indonesian government has set a target of producing 600,000 electric vehicles by 2030. Hyundai Mobis has also constructed an EV battery system plant in Indonesia. The company, part of the Hyundai Motor Group, is investing around 60 million US-Dollar. Battery cells are secured from the local joint venture, HLI Green Power, and the finished battery system as a module will be supplied to the Hyundai Motor plant.

Chinaplas

At Chinaplas 2024, Indonesian plastics manufacturers will witness a full range of new materials and high-tech processes to enable them to further enhance their production efficiency and profitability in the wake of fast-changing consumer preferences, the organizers of the trade fair concluded. The exhibition would highlight "the most advanced packaging technologies and environmentally friendly materials to support the move towards a circular economy". A broad range of machinery, equipment and engineering plastics were also on exhibit to promote the development of the automotive industry.

chinaplasonline.com

IFAT MUNICH 2024

Municipalities are among the most important users of the products and processes presented at the IFAT Munich 2024 environmental technology trade fair.

From May 13 to 17, 2024, IFAT Munich will bring the global environmental technology industry together again in one place, the organizers announced. The exhibitors at the Munich exhibition center would then once again present their latest products, processes and services from the fields of water and wastewater, waste and raw materials management to the specialist audience. "For many of them, cities and municipalities, with their wide range of environmentally relevant tasks, are part of their key customer base."

Day of resilient municipalities

Heavy rain and flooding, extreme heat and water shortage – the consequences of climate change cannot be ignored. That results in growing pressure on all social players, such as politicians, companies, and private individuals, to adapt to the changed conditions. Municipalities play a special role on the path to more climate resilience. IFAT Munich is devoting the "Day of Resilient Municipalities", taking place on Thursday, May 16, to this key role. In collaboration with the German Technical and Scientific Association for Gas and Water (DVGW), the German Association for Water Management (DWA), and the Association of Municipal Enterprises (VKU), lectures, expert panels, and guided tours providing stimulus and insights will be offered for all representatives of the municipal sector.

Digitalization and protection of critical infrastructure

As with society as a whole, cities and municipalities are, of course, also called upon to address the opportunities and risks of the megatrend of digitalization. The VKU, for example, is organizing a panel discussion on the forum stage entitled "AI: Detection systems and reusable materials scanners—how much AI does the waste industry need?" It will examine the question of whether AI is suitable for minimizing resource consumption and improving the quality of the individual categories of waste collected in the interests of a functioning circular economy. The public utility and waste disposal industry are also a critical infrastructure (KRITIS). "The physical and virtual threat has been growing here for years. It is essential to protect these services," VKU Vice President Patrick Hasenkamp was quoted. On the forum stage, the association will show which legal obligations KRITIS operators must already fulfill now and, more importantly, in the future.

The VKU solution tour "Waste Logistics 2035" also takes a look into the future. "Waste logistics will play a decisive role in resource management by minimizing waste, preserving valuable resources, and hence reducing the environmental impact," Hasenkamp is convinced.

Clean drives for municipal vehicles

According to Burkard Oppmann, President of the German Municipal Vehicles and Equipment Industry Association (VAK), regarding municipal vehicles and equipment, the use of alternative drive systems, especially hydrogen and battery solutions, and the development of the required charging infrastructure are still key issues. The VAK will be holding a 45-minute panel discussion with industry experts on these and other topics on each day of IFAT Munich 2024. As reported, the discussion will deal, among other things, with an emission-free municipal vehicle industry and municipal economy, the promotion of CO_2-free waste disposal, and professional driver qualifications.

Photo: Messe München GmbH

The future topic of hydrogen

What role can hydrogen play in the municipal circular economy? A Spotlight Area is dedicated to this question. According to the organizers, the DVGW and the Zentrum Wasserstoff.Bayern (H2.B), will show that there are interesting starting points both in the production and use of this energy source and its by-products. "For example, the energy generated in waste-to-energy and biogas plants can be used for carbon-neutral hydrogen production. In addition to hydrogen, the electrolysis of water also produces oxygen, which can be used to effectively aerate clarifiers. Methane from sewage sludge treatment or also plastic waste can be processed into hydrogen and carbon that can be used in agriculture or industry. And the fact that the first waste collection vehicles are already running on hydrogen has already been mentioned above."

ifat.de/en

Seville, Spain

CLIMATE FRIENDLY FUTURE DEPENDS ON A SUCCESSFUL CIRCULAR TRANSITION

Currently, the production, consumption and disposal of products and food are responsible for almost half of global greenhouse gas emissions and up to 90 percent of biodiversity loss, according to the latest Circular Cities Declaration report. This take-make-waste approach is exacerbating the consequences of climate change and, as the demand for strategic resources such as steel, cement, plastics and food is projected to rise by 42 percent by 2050, the transition to a circular economy is only becoming more urgent.

Photo: martine87 / pixabay.com

Cities and local governments have a key role to play in this transition. In Europe, the European Commission is increasingly recognizing local authorities' leadership in this area by initiating and funding various projects that help cities take measures to close and shorten material loops across the entire value chain and life cycle of materials. These efforts, including CityLoops, CircularInvest and Definite-CCRI, have helped cities like Høje-Taastrup and Roskilde (Denmark) and Seville (Spain) take concrete actions in line with the Commission's Circular Economy Action Plan. It is important to ensure, however, that these are not isolated

actions. A successful circular transition, where resource consumption is meaningfully decoupled from economic growth, requires circular practices to be embedded in organisational and policy strategies.

Two great examples of integrating circular practices into plans for the future come from Denmark where, within the context of the CityLoops project, Høje-Taastrup incorporated circular goals into its Climate Action Plan, securing a political mandate to support pilot projects exploring circular construction. One of the pilot projects sought to repurpose the municipality's City Hall: in 2016, the City decided to establish housing for new residents and to create a nice space for municipal employees to work together. Originally, Høje-Taastrup planned to demolish the old City Hall and build a new one in a different location. In the end, a new City Hall was built, while the old City Hall was being converted into housing, saving an estimated 20,000 tons of natural resources and 2,000 tons of CO_2 emissions. The municipality added the lessons learned from this project to its Sustainability Strategy and, as a result, will give preference to repurposing and renovation over demolition for future projects. For Høje-Taastrup this is just one of the many positive ripple effects of its work in CityLoops. Turan Akbulut, City Council Member and Chairman for the Planning and Environment Committee notes:

"The mindset is changing, and we are becoming more aware of the importance of planning for effective use of our resources. On an organizational level, an example of these changes is the establishment of a municipal sustainability group. Furthermore, the development of the sustainability strategy has had the effect both of inspiring others throughout the organization and making sustainability more visible, while also setting certain structures in place to ensure that sustainable practices are prioritised."

Meanwhile, Høje-Taastrup's neighbour Roskilde secured a political mandate to engage in circular construction projects with a focus on the reuse and recycling of construction materials, design for recycling, and reuse of excavated soil. Such a mandate facilitates alignment between overlapping or competing plans and ensures the smooth implementation of actions, tasks and activities. To secure its mandate, the municipality established conditions for experimentation in the urban development area of Musicon. According to Klaus Kellerman, Senior Consultant, Circular Construction, Roskilde, taking a more holistic view made it much easier to create political goodwill for this work:

"Normally it can be a struggle to secure a mandate for circularity from project to project, but we embedded levers in the vision for the area, local plan(s), stakeholder agreements and established a secretariat to secure sustained commitment."

For Roskilde, this project has also provided a great opportunity to develop collaborative projects with construction companies, allowing for efficient and cooperative risk management between the different stakeholders. As Kellerman recalls:

"Through our participation in CityLoops, we have substantially developed our risk management. We now operate a risk mapping with three key elements: the isolation of risk, early dialogue, and the building phase: dialogue and transparency. This means that instead of operating in a "black box", we now operate with a clear idea of the risks involved and how to overcome them."

Roskilde's approach enabled more ambition in its work in the Musicon area. The municipality hopes to continue developing a new urban district, centred around music,

New City Hall, Høje-Taastrup

Photo: Høje-Taastrup

that will encompass a blend of residential and commercial spaces, including shops, cultural and leisure activities. In Muiscon, existing buildings are already being refurbished or demolished with leftover construction materials and soil going toward new construction. For instance, dug-up concrete was crushed and used to replace 100 percent of the coarse aggregate in new concrete for the foundation of a building car park. This is estimated to have saved approximately 50,00 Euro, compared to the use of new concrete.

Further south, Seville also focused on embedding circular practices with an emphasis on citizen engagement. By promoting and raising awareness of circular activities among citizens, municipalities are more likely to gain a political mandate for long term circular policies that can meaningfully advance the circular transition. To that end, Seville developed a City Simulation Platform, which includes instruments for the data-driven planning, collection and treatment of various waste fractions, evaluation of citizen satisfaction and policy effectiveness, and the simulation of future scenarios.

Seville's platform contains a construction and demolition waste flow optimization tool, which supports managers in deciding on future clean point sites, while giving citizens access to maps with the locations of the closest clean point. The platform also contains a well-being monitoring tool that determines the relationship between well-being and project actions. This tool can be used by both policy-makers (who receive access to a simulation framework that quantifies the influence of circular actions on well-being) and citizens (who get access to data about specific well-being circularity indicators, relevant actions and impact estimations on the city's well-being). By combining these tools in a single platform, Seville is able to support cross-sectoral dialogue and facilitate data exchange between municipal departments, research institutions and relevant business partners.

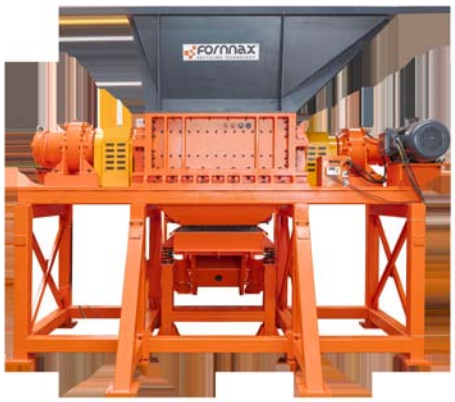
Photo: Roskilde

Musicon public space

Alongside Seville, Roskilde and Høje-Taastrup, Apeldoorn (The Netherlands), Bodø (Norway), Mikkeli (Finland) and Porto (Portugal) also participated in the CityLoops project where they contributed to the development of handbooks on bio-waste and construction and demolition that provide concrete advice for other municipalities. The handbooks feature practical examples outlining how cities implemented the tools they developed, why certain decisions were made, what could have been done differently and how this work fits into the broader context of European circular strategies and policies.

To reduce greenhouse gas emissions, protect biodiversity, and support a climate-friendly future, circular practices must be integrated into activities across Europe, and beyond. Inspiring examples of this work already highlight the progress European cities are making in implementing circular principles, and by sharing these experiences we can only hope others will follow in their footsteps.

■ Author: Jon Jonoski, Expert, ICLEI Europe



SORTING OF ALUMINUM ALLOYS

The Italian corporation SGM Magnetics, one of the leaders in X-ray sorting technologies for metal recyclers including X-ray Transmission and X-ray Fluorescence is now launching its latest proprietary X-ray technology called XRF-BS. This technology consists in the combination of X-ray Fluorescence with X-ray Back Scattering presented as an alternative to LIBS (Laser Induced Breakdown Spectroscopy) for the sorting of aluminum alloys.

X-ray Back Scattering is an underlying phenomenon to Fluorescence and is usually considered as a rumor in the XRF spectrographic sorting analysis as, instead of being represented by a few high intensity peaks of specific energies, it is characterized by a continuous distribution of low intensity photons, the distribution profiles of which are characteristic of the presence of the various metals. XRF-BS can identify metal concentrations down to 0,2 percent which makes it a performing solution for sorting the different aluminum alloys and a competitive alternative to LIBS. The main benefits of XRF-BS vs LIBS are:

Reading penetration

Unlike X-ray transmission, which performs a readthrough analysis, both XRF-BS and LIBS perform a “surface” analysis. This means that the accuracy of both the LIBS

Photos: SGM Magnetics

and XRF-BS readings is impacted by the surface condition (dirt, painting, oxidation,…) of the material to be analyzed. "Reading" accuracy depends on the thickness of the "coating" and on the penetration of the reading.

XRF-BS "penetration" is typically around 100-200 microns while LIBS penetration is usually around 10 to 20 microns depending on the level of energy used for the laser source and the type of laser lens.

The typical thickness of painting on aluminum profiles is over 40 microns which is less than XRF-BS penetration and more than LIBS' one.

Continuous vs discontinuous reading.

XRF-BS performs a continuous reading while LIBS reading is discontinuous making it a "sampling" analysis.

LIBS is, for sure, good enough on tailings of aluminum sheets at stamping plants. In this case, the surface of the material is always clean and every piece is homogenous in composition, meaning that a shallow surface sampling analysis provides an accurate analysis of the whole piece. Last but not least, in such an application, you know in advance the limited possible different types of aluminum the technology is processing which helps the sorting.

In case of aluminum scrap, the situation is different and the deeper and continuous analysis of the XRF-BS is a plus.

Reading distance

Reading distance is a sensitive element for both XRF-BS and LIBS but it is easier to control in the case of XRF-BS.

With XRF-BS, the reading must take place within a certain distance from the surface of the piece but this is no problem as the reading is continuous and material is analyzed from underneath while in free fall. With LIBS, there is the additional constraint of making sure to stay within the focal length of the laser that is typically around 20mm which is not a lot when you consider possible long and misshaped aluminum profiles. Focal length can be increased but that goes against the energy and penetration depth.

sgmmagnetics.com

EXCAVATOR LIEBHERR R 980 SME IN SLAG HANDLING OPERATIONS

German company Backes Transport und Schlackenaufbereitung GmbH uses the Liebherr R 980 SME crawler excavator for loading hot and cold slag. To meet the challenges of this kind of operation, the machine was specially built per the customer's requirements.

For slag loading work, the machine is equipped with special safety devices such as a fire-fighting system, the provider pointed out. "Exposed lines and hoses are covered with heat shielding. This crawler excavator features a wide walkway on the operator's side, which can be accessed via a retractable ladder. Both features ensure safe access to the elevated operator's cab and the machine's engine compartment." The crawler excavator for Backes was developed by Liebherr Application Center, which was set up in 2020 at the Liebherr-France SAS site in Colmar. "Specific requirements and customers' special requests are analyzed there, and the analysis is used for building tailor-made machines," the company emphasized.

liebherr.com/en

The R 980 SME's dump bucket can handle large volumes of slag

Photo: Liebherr

EUROPE'S LEADING MACHINE MANUFACTURERS UTILIZE TRO'S INDUSTRIAL KNIVES

For nearly a century, TRO – cutting tools, has been a strong representative of the production of industrial knives. Over the years, TRO has evolved into a global supplier of industrial knives, securing a prominent position among the largest producers in Europe.

With a modern approach and a workforce of 150 employees, TRO operates as a key player in the production of the industrial knives, wear, and other machine spare parts. Established in 1926 as a company specializing in the production of industrial knives for the wood processing industry, TRO has undergone a significant transformation over the years. Today, the company is a strategic supplier of industrial knives for the most demanding European machinery manufacturers across various industries, including recycling, plastics, wood, and metal.

TRO knives can be found in 60 countries on all six continents, with a strong presence in Europe, particularly Austria, Germany, France, Italy, Spain, and Scandinavia. The US is an important market for the company, as it is gradually entering the African market, and it is also active in South America and Australia.

Active Engagement in Product Development

60 percent of TRO's revenues come from collaboration with Original Equipment Manufacturer (OEM) customers, integrating TRO knives into their machinery. TRO's research and technology department works actively with the customer in the development of their own products, and is fully capable of producing the complex products they have envisioned. The company enjoys using its experience and knowledge to help customers manufacture optimal, high-quality products that are also cost-effective. TRO is strongest in the recycling and plastics industries and becoming better and stronger in the metals industry as well.

Tailored Solutions and Customer Focus

The company also works with customers who use machines; depending on the problem they are trying to address, they propose and find the right solution that enables the knife to work to its optimal capacity, or establish what the customer wishes to achieve with the knife in the final product or in the processes performed by the machine into which the knife has been built.

Investments in Technology and future expansion plans

Following the ISO 9001 standard, TRO executes its entire manufacturing process. Continuous upgrades to machinery and the automation of production processes reflect the company's commitment to staying at the highest technology level. TRO values long-term relationships with customers, many lasting over two decades, showcasing reliability and product quality. Certified material suppliers ensure the high quality of their products. Newly acquired customers and good customer forecasts mean that TRO is planning further growth in business. The company's number one aim in the next few years is to expand its capacity and increase competitiveness in the global market.

tro.si

Photos: TRO

Mattress Recycling:

REPOLYOL FROM POLYURETHANE FOAM

German-based H&S Anlagentechnik GmbH has realized an industrial-scale reactor plant for RetourMatras, a Dutch recycling company specialized in dismantling of mattresses and their transformation into circular resources.

Photo: H & S Anlagentechnik

The plant uses an advanced depolymerization recycling technology to produce high-quality recycled polyol (Repolyol) from polyurethane foam (PU) from end-of-life mattresses, the plant manufacturer explained. Polyol is one of the key building blocks of polyurethane foam, the main cushioning material in mattresses. “Its recovery without compromising on its quality enables its reuse as a circular raw material for the production of new PU foam and thus for new mattresses and other upholstered furniture – a significant step to circularity.” Commissioning of the facility took place in May 2023 in Lelystad (NL) allowing it to convert PU foam from 200,000 mattresses into repolyols annually using the recycling technology of H&S. Recently, RetourMatras also collaborated with IKEA Retail to find a circular solution for the end-of-life of their mattresses in line with the company’s approach to products made from recycled or renewable materials.

As underlined by the provider of the Dutch recycling plant, H&S is continuously working on advancing its technologies and equipment for end-of-life PU recycling. The reactor plant in the Netherlands is not the company’s first industrial-scale PU recycling project. As part of the RENUVA mattress recycling program of Dow, the H&S team, for example, supported Orrion Chemicals Orgaform from France with their system concept. “Besides, one of the biggest Polish PU slabstock foam manufacturers Ikano Industry (previously Dendro Poland) has been using H&S technology since 2013, also recovering valuable polyols from production waste,” the German company informed.

hs-anlagentechnik.de/en

FORNNAX ADDS 430 HP SECONDARY SHREDDER TO R-SERIES LINEUP

Fornnax Technology establishes a new benchmark by introducing R4000-HD. Fornnax possesses a trump card in aspects of making the tyre recycling business profitable, with formidable performance efficacy criteria. The introduction of the new Fornnax R4000-HD is going to be a game changer in the recycling industry.

"Waste is a human invention and it's time to invent our way out of it!"

Fornnax Technology has showcased the R4000-HD Tyre Shredder at the IFAT India 2023, a premier event for technological ingenuity that keeps the ecological ethos intact. Mr. Pravin Darade (IAS), Principal Secretary, Environment and Climate Change Dept, Govt of Maharashtra has inaugurated the R4000-HD with an indomitable grandeur. The expo's visitors have had the opportunity to witness the machine's capabilities and learn more about the innovative principles that drive its efficiency. The IFAT Expo 2023 in India provided a platform for Fornnax Technology to interact with industry professionals, partners, international delegates and potential customers from around the world. The company was excited to share its allegiance to advancing recycling technology and sustainable practices on a global scale.

Fornnax R4000-HD – The Multi-faceted Shredding Equipment

Fornnax's engineering marvel, that specializes in shredding and recycling technology for waste processing, has begun revolutionizing how shredder machines are viewed. The R4000-HD is a powerful machine designed to make secondary shredding and steel separation more efficient and profitable than ever. This machinery is afoot to strengthen the position of Fornnax Technology as an industry leader. With more than a decade of experience developing advanced shredding and recycling equipment, the Fornnax R4000-HD shredder is a radical addition to the pre-existing fleet of Fornnax's stable. The machine is designed to process various materials, from tyres, cable, e-waste and aluminium scrap. The notable benefits of R4000-HD are:

- The hydraulic hopper and screen opening are designed to make maintenance procedures easier and provide convenient access to the cutting chamber quickly.
- Fourfold use and multiple-time re-grinding blades, with reversible screens, give long service life to the worn parts, thus lowering the operating costs.
- Specific Stop Feature controls the material feeding according to machine load percentages for high production efficiency.
- Rapid screen change system controls the output size and wide range of shredding capabilities to handle various materials.
- Completely hard-faced rotor and replaceable wear plates help reduce the need for frequent replacements and increase the shredder's lifespan; the machine's cutting unit is incredibly durable.
- R4000-HD is the dominant machine in the industry because of its heavy rotor design and highest cuts per minute (13,500) at 270 rpm, making it the most powerful machine in the industry.

The R4000-HD secondary shredder

Photo: Fornnax

Thanks to, the high capacity R4000-HD Model, it saves electricity, man-power and wear and tear cost

The idea to make a secondary shredding machine that can showcase such major characteristics when compared to its counterparts was the brainchild of Mr. Jignesh Kundaria (Director, Fornnax). He aimed to create the equipment using simple yet ingenious principles that may not have been explored by others. Though the concept is visible to develop such a technology that focuses on electricity and labor conservation along with saving the wear and tear cost. R4000-HD with its heavy rotor shaft and sturdy design showcases the robust ideology behind this marvelous machinery.

Fornnax Technology has made a significant move with the R4000-HD, a solid and robust machine ideal for operating in the most challenging conditions, as Mr Kundaria states, along with an eminent service life of 20 to 25 years. Fornnax is going to use the R4000-HD as a gateway to enhance its international footprint. The focus market for the high-capacity R4000-HD Model is cement plants where a large volume of TDF plants is required, and global recyclers that have established raw materials and sales markets are available.

Established Global Presence

Fornnax Technology has made a big shift to the R4000-HD, a reliable and sturdy machine appropriate for use in the most difficult circumstances and packed with a behemoth of a motor along with more than two decades of service life. The R4000-HD will serve as a gateway for Fornnax to expand its global reach. Given that the Middle East is close to India, which makes it easier for the business to give after-sales service, Fornnax's wise minds view it as an extension of the domestic market with a primary concentration on the Indian subcontinent.

The markets of Kuwait, Oman, and Qatar in the Middle East have an enormous supply of scrap tires. Due to the recent change in standards regarding the exportation of whole-baled tires into Australia, the recycling industry will become more prominent and will eventually cover the entire country. Due to the increased demand for recycling equipment and the potential after-sales service network and spare parts availability, there will be a huge market opportunity.

fornnax.com

Fornnax Wins the Best Tyre Recycling Industry Supplier Award

Fornnax Technology, a renowned pioneering force in the industry of tyre recycling solutions, has yet again demonstrated its commitment to excellence by attaining the prestigious Best Tyre Recycling Industry Supplier Award at the Recircle Awards 2023. Fornnax's leadership and revolutionary influence on the tyre recycling landscape are acknowledged with the Best Tyre Recycling Industry Supplier Award at the Recircle Awards 2023. It is an affirmation of Fornnax's unceasing efforts to push the limits of technological innovation and create new benchmarks for quality in the tyre recycling sector. While the company commemorates this historic accomplishment, Fornnax Technologies is dedicated to continuing to advance tire recycling technology and have a positive impact on a cleaner, greener future for the earth.

Panizzolo Recycling Systems:

SOLUTIONS THAT INNOVATE THE FUTURE

The rapid transformations involving the metal recovery sector present significant challenges for companies. But how do businesses respond to change? The vision of Panizzolo Recycling Systems, a leading Italian company in the sector, helps us understand how to prepare to make the most of future opportunities.

In this exclusive interview with Mauro Panizzolo, the owner and commercial manager, the evolution of the sector and the company's strategy, from investment in Research and Development activities to focussing on training through the Panizzolo Recycling Academy will be analyzed.

What have been the main changes you have observed in the scrap business sector over the past few years?

Our sector is at the center of a significant evolutionary phase. First of all, complex scrap is increasing, while the market requires the reintroduction of more refined products into the economic cycle. Consequently, metal valorization is more of a priority than ever. In this context, companies are called to invest in high-performing innovative technologies to safeguard their competitiveness, becoming particularly attentive to all qualitative aspects that guarantee a medium-long term economic return. Simultaneously, the international regulatory framework is constantly evolving, with stringent requirements that demand an ever-greater effort to optimize treatment processes and reduce environmental impact.

Being able to adapt to new challenges becomes essential. How has the evolution of the sector influenced your business strategy?

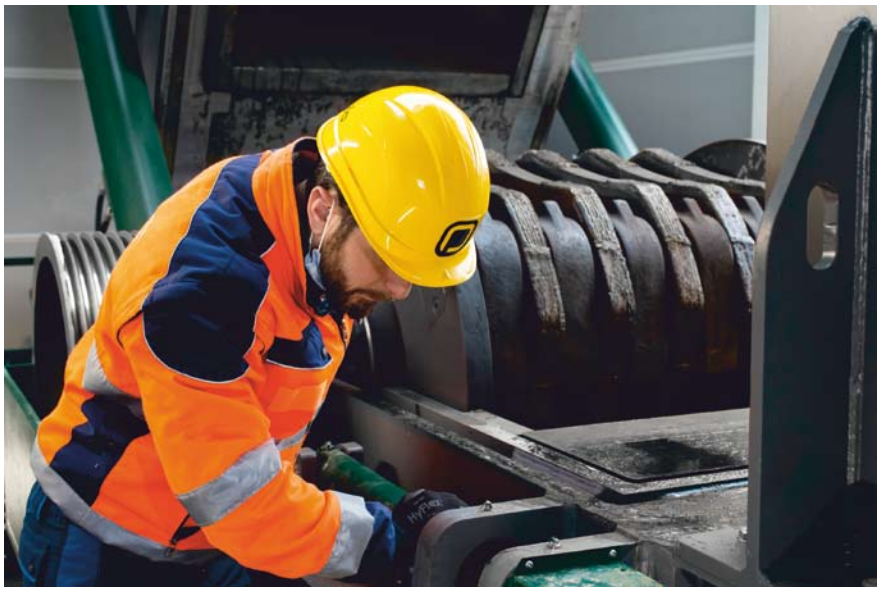
In a complex scenario like the current one, we want to be a point of reference, playing in advance to transform changes into opportunities, not only at the national level but also on the international scene. Our response to emerging challenges has focused mainly on innovation through constant investment in Research and Development activities that have led us to establish new efficiency standards. This allows us to offer our clients, worldwide increasingly advanced solutions for achieving their goals, with particular attention to compliance with current safety and environmental regulations.

What direction is your Research and Development activity headed in today?

Over the years, the focus on technological progress has guided us in creating important patented components, like the interchangeable cradle and the refining plant. This innovative spirit drives us to aspire to new goals, with an eye towards the future. At the moment, our team is engaged in designing a revolutionary machine that we will present this year. We can tell you that it will be an innovative pre-shredder designed to process large quantities of particularly burdensome scraps, such as vehicles and car packages complete with engine and mechanics, aluminum, and mixed scraps, with top-level performance.

Specifically, this machine is born to maximize the productivity of hammer mills, like those in our MEGA series. No solution on the market was able to meet this need, so we decided to take up this challenge by leveraging all our know-how. In the coming months, we will test all aspects of operation, structural configuration, production capacity, and actual profitability to ensure that the final result meets every expectation. It's a new project that really excites us, and we can't wait to reveal all the details.

Among new needs and rapid transformations, you have managed to best interpret the valorization of metals. What are the strengths of your plants?



Photos: Panizzolo Recycling Systems

Consolidated experience and deep knowledge of the sector allow us to offer solutions that effectively meet our clients' needs, maximizing their investment. First of all, our plants can quickly adapt to different treatment requirements, simplifying and speeding up the type and size of incoming waste. The perfect balance between low energy consumption and high productivity also ensures a significant economic advantage and optimal long-term results. The MEGA 735 hammer mill, one of our flagship models, perfectly represents this plus: operating at 450 kW, it guarantees productivity of up to 35 tons/h. Furthermore, our solutions achieve complete metal valorization up to End-of-Waste treatments, with very high-quality output. All this, combined with structural solidity, ease of maintenance, and the offer of training courses, allows us to consolidate our reputation for excellence and reliability.

Not just high technological value, but also specialized training. Can you tell us more about the Panizzolo Recycling Academy?

The training path of the Academy leverages a wealth of knowledge and experiences acquired over time and reflects our constant commitment

Mauro Panizzolo

to innovation. The program allows learning all the necessary skills for effective plant management, covering many topics, from operational aspects to maintenance and organization. The training, conducted by our highly specialized technicians, is designed for our clients and aimed at the entire work team, with a flexible teaching approach that combines theory and practice. At the end of the course, following the passing of a test, a certification of the acquired skills is also issued.

What advantages does the Panizzolo Recycling Academy offer, and how do these translate into concrete improvements?

We have worked hard to create this training program, transferring our know-how into a comprehensive path. We have received excellent feedback from our clients, with positive and concrete results. The Academy's training not only raises the professional standard of the individuals involved but allows all the potential of a plant to be exploited, significantly improving performance and profitability. Management becomes more efficient, and all operations and related costs are optimized, with a consequent maximization of the investment.

Our educational approach also promotes a more agile way of working, essential today to successfully face current and future challenges. In this way, companies have all the tools to operate with greater efficiency, sustainability, and profitability, strengthening their competitive advantage in the long term. These results not only confirm the value of the Academy but encourage us to continue in this direction to expand the training offer.

The 2024 edition of IFAT is just around the corner. What are your expectations and what will be the focus of your participation in the fair?

IFAT, as always, is a unique stage for us to show the world our innovative spirit, and we are excited to present the latest news, including the new pre-shredder. In this edition, technology and environmental sustainability will undoubtedly be protagonists, so it will be an important occasion to reflect together on the future of the sector and explore new trends.

■ You can find Panizzolo Recycling Systems at stand 223/322, in hall B6, in a completely renovated space where the team wait to introduce you to the Panizzolo world and let you discover all solutions!

panizzolo.com

HOW TO CHOOSE THE RIGHT PERMANENT OVERBAND MAGNET

Permanent Overband Magnets are commonplace in most mines and quarries, removing tramp ferrous metal and protecting crushers, screens and conveyors against damage. However, there are different designs of such magnets developed to suit specific applications.

According to Bunting, one of the leading designers and manufacturers of magnetic separators, eddy current separators, metal detectors and electrostatic separators, understanding an installation is key to selecting the right overband magnet. The company designed and built the first magnets of this type in the early 1980s and has since supplied thousands to companies operating worldwide. “Although the basic technology has not changed, advances in magnet materials and manufacturing techniques have significantly enhanced the ferrous metal separation performance,” the company with European manufacturing facilities in Redditch and Berkhamsted (both in the United Kingdom) underlined. “Overband magnets lift and automatically remove tramp ferrous metal from conveyed mined or quarried rock. The permanent design features a magnet block mounted in a frame, with two or four pulleys, and a revolving self-cleaning rubber belt.”

In operation, mined or quarried rock is conveyed underneath the overband magnet, which attracts, lifts and then removes damaging tramp ferrous metal. “The size and type of magnetic system (permanent or electro) is dictated by the conveyor width, depth of material on the conveyor and the nature of the tramp ferrous metal. Permanent overband magnets are commonly found on mobile plants such as crushers, screens and shredders, and in lower volume installations.”

Bunting Permanent Overband Magnet

Models and Applications

Bunting’s range of permanent overband magnets includes four models to suit different installations. The heavy-duty PCB model suits quarry and small mining operations, operating at suspension heights of up to 400 millimeters (mm) on conveyors between 300 mm and 2,000 mm wide.

As pointed out, the PCB-C compact and lightweight model suits mobile plant installations, such as crushers and screens, and operations where space is limited. The PCB-C operates at suspension heights up to 250 mm, above 600 mm to 1,500 mm wide conveyors.

For installations where the magnet is located in a difficult location for regular maintenance, Bunting designed the QBC quick-belt change model. As the model implies, the self-cleaning belt is easy and quick to change, reducing downtime. This model operates at suspension heights up to 300 mm on conveyors between 600 mm and 1,500 mm.

The Tri-Polar overband magnet produces a different shaped magnetic field with increased power. Although commonly heavier, the deeper magnetic field means that the suspension height of the Tri-Pole is higher, up to 400 mm. The shape and depth of the magnetic field make this model better suited for separating smaller or long and thin (e.g. nail-like) tramp ferrous metal.

Overband magnet Selection

Selecting the correct overband magnet, in terms of permanent or electro and the specific model, is dictated by the application. “Bunting’s applications engineers assess the ferrous metal separation objective (i.e. the plant being protected); the nature of the tramp ferrous metal (i.e. shape, size, etc.); and the conveyed rock (i.e. size range, burden depth),” the company informed. These criteria would assist the team in selecting the optimum magnet for any given application.

bunting-redditch.com

Photo: Bunting

CREATING VALUE FROM WASTE IN THE STEELMAKING INDUSTRY

In January this year, the European ZHyRON project was launched in Spain to pioneer a new process for recycling steel-making by-products based on using green hydrogen.

As reported by independent non-profit media agency youris.com, nine companies and institutions from six European countries collaborate to pioneer a valorization pathway for steel-making by-products rich in iron and zinc, with the goal of enhancing the sustainability and circularity of the steel industry. Although valorization processes would already exist in this field, "they rely on high CO_2 emissions, compelling the metallurgical industry to transition to hydrogen as part of its journey towards carbon neutrality".

The project will thus explore solutions related to technical integration, economic viability, and environmental considerations. "This will foster innovative business models and strategies for the extraction of still usable iron and zinc from metallurgical waste using hydrogen as reductant," the information said. "From a technical point of view, the project's approach involves a combination of pyrometallurgical processes and hydrometallurgical stages: the recovered iron

Photo: Jure Ahtik / stock.adobe.com

oxides will be transformed into direct reduced iron, suitable for consumption in electric arc furnaces, while the extracted zinc will be processed into zinc oxide concentrate for use in many sectors, from batteries to agriculture, with an eye to wastewater treatment and reuse."

These potential solutions would offer several benefits, including preventing hazardous waste landfilling, reducing CO_2 emissions, and establishing a new circular economy loop. In the words of Macjei Kaplan, from Green Iron (Sweden) "The aim of the ZHyRON project is to transform the current linear steelmaking process into a circular and sustainable flow of resources", while the project's technical coordinator, José Luis García Cimadevilla from ArcelorMittal, stresses that "By collaborating and utilizing the expertise of each of the nine partners, we aim to develop a new process based on green hydrogen and electricity, without CO_2 emissions and other environmentally harmful gases".

Funded by the European Health and Digital Executive Agency (HaDEA) as part of the Clean Steel Partnership, ZHyRON brings together a consortium of nine partners from six European countries: Fundación CIRCE – Centro de Investigación de Recursos y Consumos Energéticos (Spain) as coordinator; ArcelorMittal Innovación Investigación e Inversión (Spain); ArcelorMittal Maizieres Research S.A. (France); Centre de Recherches Métallurgiques asbl (Belgium); Green Iron H2 ab (Sweden); BFI - Vdeh-Betriebsforschungsinstitut Gmbh (Germany); Hydrometal S.A. (Belgium); Jean Goldschmidt International (Belgium) and Fondazione ICONS (Italy).

■ ICONS will be in charge of the communication and engagement actions with stakeholders: 🌐 icons.it

From Bottle to Flake:

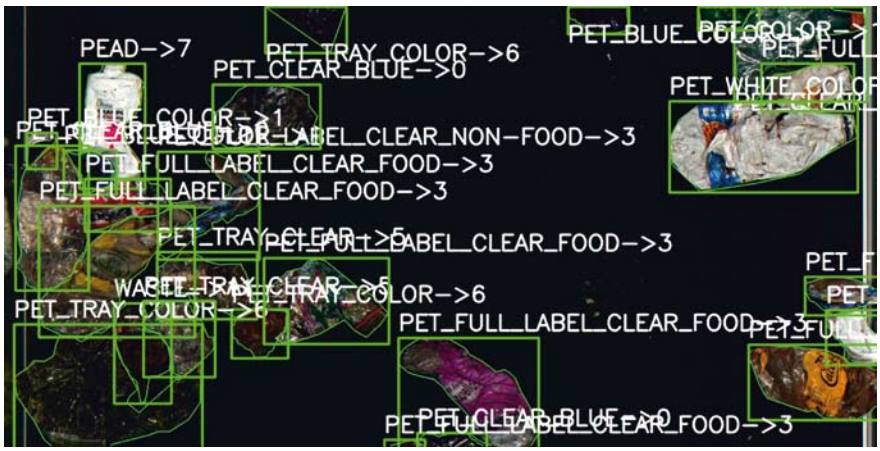
PIONEERING THE PATH TO SUSTAINABLE PLASTIC RECYCLING

In an era where sustainability transcends choice to become a necessity, the transformation of plastic from bottle to flake symbolizes the epitome of recycling, embodying the circular economy's principles. This journey, initiated by individuals depositing their used plastic bottles, culminates in these materials being reborn as pellets ready for crafting new bottles, showcasing technological innovation and environmental stewardship.

Central to this recycling saga are the ECOPACK and ECOFLAKE systems by PICVISA, which streamline and enhance the efficiency of this process. ECOPACK, an optical sorter, leverages hyperspectral imaging to distinguish plastics based on composition and color. As bottles enter recycling facilities, mixed with other waste, ECOPACK's precision in identifying and separating plastic bottles from the waste stream is indispensable. This accuracy in initial sorting ensures that only plastic bottles proceed to the next recycling stages, minimizing contamination and enhancing the quality of the final product.

Following sorting, the bottles are shredded into smaller pieces, or flakes, introducing ECOFLAKE into the narrative. Specializing in plastic flake recycling, ECOFLAKE employs advanced NIR technology and high-resolution cameras for further purification. It meticulously sorts flakes by color, transparency as well as composition, eliminating impurities and ensuring the integrity of the recycled plastic for food-grade packaging.

The integration of ECOPACK and ECOFLAKE into the recycling process not only makes recycling operations more efficient but also supports producing high-quality recycled pellets. These pellets are then used to manufacture new plastic bottles, achieving a closed loop in the plastic lifecycle. That practice conserves resources, reduces the demand for virgin plastic, and lessens the environmental impact of plastic waste.



Enhanced sorting accuracy

Moreover, these technologies enable recycling facilities to operate more sustainably and economically. Enhanced sorting accuracy leads to reduced processing times and energy consumption, lowering the carbon footprint. Additionally, the production of higher-quality recycled plastic can open new markets for recyclers, promoting the recycling of plastic waste.

European efforts in plastic recycling have seen significant advancements. According to Eurostat, the European Union's statistical office, the recycling

Photos: PICVISA

rate of plastic packaging waste has been steadily increasing, reaching over 42 percent in recent years. That indicates a growing commitment to recycling and the potential impact of technologies like ECOPACK and ECOFLAKE in achieving higher recycling rates.

The journey from bottle to flake, facilitated by ECOPACK and ECOFLAKE, reflects the potential of modern recycling to contribute to a more sustainable world. As the global community continues to address plastic waste challenges, these innovative solutions offer hope, demonstrating that technological advancement and collective effort can create a circular economy where the value of plastic is continuously renewed, fostering a more sustainable and environmentally conscious society.

picvisa.com

HALF A BILLION AEROSOL CANS RECYCLED

DeSpray Environmental, a leading company in the aerosol recycling technology, has announced a major achievement.

"The combined efforts of DeSpray co-founders Mike MacKay and Eelco Osse, over the last 25 years, have resulted in 560 million + aerosol cans being 100 percent recycled and removed from the waste stream," the company pointed out. This accomplishment would highlight DeSpray's commitment to environmental sustainability and its success in pioneering advanced recycling technologies. "These ongoing efforts are currently responsible for 260 cans per second and rising with every DeSpray system that is commissioned." According to the information, the firm's half of a billion milestone of recycled aerosols "is more than a numerical achievement. It represents a steadfast commitment to reducing the environmental impact of aerosol waste, which has otherwise been unchecked. As DeSpray continues to innovate this technology and expand its influence, it remains focused on leading the industry towards a more sustainable future."

DeSpray DS1500, capable of processing 1500-2000 cans per hour

Photo: DeSpray

About DeSpray Environmental

DeSpray Environmental is a privately owned and operated company based in the Netherlands. It is part of the Boessenkool group and manufactures standalone aerosol recycling systems. "These newest unique containerized recycling systems can be installed and commissioned within ten days on site. That includes training."

All of the systems were individually ATEX, UE and CE certified systems. The DeSpray 1500, 3000 and 5000 are designed to target mid to large-scale waste management companies that see aerosol recycling as a niche market.

despray.com

The New XHW Primary Grinder:

IMPROVED PERFORMANCE AND REDUCED CONSUMPTION

Forrec is an Italian company that designs, manufactures, installs and manages single machines and complete plants for waste treatment. For years, Forrec has been working in the field of machinery for the recycling of metals, MSW, plastics, paper and WEEE, constantly investing in research and development for optimizing recycling lines. In Spain, Forrec is supported by PacMachinery, a company with more than 40 years of experience in the industry.

Recently, Forrec presented the latest line of XHW primary shredders. This new model represents a qualitative leap in the world of recycling lines, combining power, efficiency and advanced technology to handle even the most complex and bulky waste, guaranteeing exceptional performance and operational sustainability.

The primary shredders play a crucial role in the recycling process, transforming heterogeneous and bulky materials into manageable fragments that can be further processed. The efficiency of this step determines the effectiveness of the entire recycling process, reducing costs and environmental impact.

The XHW primary grinder, with its state-of-the-art features, is the ideal solution to optimise this process, offering superior volumetric reduction and optimal preparation of materials for subsequent recycling steps.

Features

Some features of the XHW grinder are:

- Enlarged cutting chamber: with a volume of 7.8 cubic metres, the machine can handle very bulky and bulky materials;
- Improved material flow: the large dedicated space facilitates the processing of expandable materials in post-processing, ensuring optimal flow;
- Improved machine access: semi-automatic tailgate opening and easy-closing front inspection doors improve maintenance and daily operation;
- Rotor innovations: thanks to 69 concave plates mounted on interchangeable supports, material cuts become sharper. The rotor has also been coated with wear-resistant material to maintain high performance and reduce maintenance and downtime.

In addition, the type of sieve can be changed depending on the output to be achieved. In fact, the six grinding grids can have the following configuration:

- Flap sieve: ideal for higher productivity, with medium and not extremely precise dimensions.
- Round hole: for lower productivity, but with more precise sizes.

Innovation, reliability and sustainability characterize each Forrec machine, which incorporates advanced technologies for higher productivity, reduced downtime and lower consumption.

forrec.eu

Photos: Forrec

Advertorial:

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ERIEZ SHRED1 BOLSTERS SHREDDERS' PROFITS AMIDST GROWING LOW-COPPER SHRED DEMAND

The Eriez Shred1 Ballistic Separator is propelling shredder yards to greater profitability with the power to capitalize on the surging demand for low-copper shred from steelmakers. With the integration of Shred1 into their operations, recyclers are gaining a distinct competitive advantage by producing a premium ferrous shred that not only meets escalating market requirements but can command a premium price per ton.

According to Mike Shattuck, Eriez USA Market Manager-Recycling, Shred1 uses magnets and ballistics to efficiently separate copper-bearing materials from shredded steel recovered by the scrap drum magnets. This unique separator yields two distinct fractions: a premium low-copper ferrous product (in the range of 0.16-0.20 percent cu) and a traditional #2 shred.

Shattuck explains, "Shred1 increases the proportion of low copper shredded scrap in the blend, empowering steel mills to reduce the cost per ton of steel produced, while simultaneously enabling scrap yards to demand a higher price for this premium grade shred." With many analysts predicting the copper deficit will affect global markets well into 2023 and beyond, Shattuck noted that Eriez anticipates a sustained and robust interest in Shred1. He emphasizes that the demand for Shred1 extends beyond the borders of the U.S., as it is already garnering significant attention and interest on a global scale.

To learn more about the innovative Eriez Shred1 Ballistics Separator, visit erieznews.com/nr614.

Established in 1942, Eriez is a global leader in separation technologies. The commitment to innovation has positioned Eriez as a driving market force in several key technology areas, including magnetic separation, flotation, metal detection, and material handling equipment. The company's 900+ employees are dedicated to providing trusted technical solutions to the mining, food, recycling, packaging, aggregate, and other processing industries. Headquartered in Erie, Pennsylvania, USA, Eriez designs, manufactures, and markets on six continents through 12 wholly owned international subsidiaries and an extensive sales representative network.

eriez.com

Photo: Eriez

SUM 2024

May 15 – 17, 2024, Capri (Italy)

The 7th Symposium on Circular Economy and Urban Mining follows the success of previous editions. It emphasizes the importance of resource conservation, environmental sustainability, and waste management revolution. The event is dedicated to refining strategies through a scientific, interdisciplinary approach that engages various stakeholders.

Organized by the IWWG (International Waste Working Group) since 2012, it serves as a platform for global scientists and stakeholders to discuss advanced results and future needs.

With the active involvement of over 60 scientists from 28 countries, the symposium will also feature hundreds of scientific presentations across various formats, including oral sessions, workshops, and posters.

sumsymposium.it

ECOMONDO CHINA – CDEPE 2024

May 16 – 18, 2024, Chengdu (China)

Ecomondo China is the upcoming Chengdu International Environmental Protection Expo organized by Europe China Environmental Exhibitions (ECEE) and the Italian Exhibition Group (IEG).

The event has been rebranded as Ecomondo China – CDEPE, primarily focusing on ecological and energy transition in Western China. It is a novel platform for the environmental sector, integrating conventional areas like water and waste treatment with emerging fields like “storage” and “electric mobility.” In line with Chinese government investments in energy transition, the expo aims to tackle global environmental challenges and facilitate networking among Chinese and international operators as it offers diverse business and investment opportunities, particularly benefiting small and medium-sized Italian companies.

cdepe.com/eng/

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