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GLOBAL RECYCLING

The Magazine for Business Opportunities & International Markets

global-recycling.info

BIR WORLD RECYCLING CONVENTION | ROUND-TABLE SESSIONS

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SINGAPORE

RAFFLES CITY CONVENTION CENTRE, FAIRMONT HOTEL

(27) 28-29 October 2024

INNOVATE, INTEGRATE, RECYCLE

This October, BIR welcomes its members at the **Raffles City Convention Centre at Fairmont Singapore**, which offers unique meeting spaces in a **prime central location** and **a wide range of accommodation options** to ensure a comfortable and convenient stay for all Convention attendees.

More information on the Convention Programme, Online Registration and Sponsorship Opportunities on ***www.bir.org/bir-singapore-2024***

Join our international exhibition and interactive plenary sessions covering all our commodities as well as international trade and legislation:

MONDAY, 28 OCTOBER

09.30	Opening Session with Keynote Address
12.00	Stainless Steel & Special Alloys Committee
14.00	Non-Ferrous Metals Division
16.00	International Environment Council
19.30	Welcome Evening

TUESDAY, 29 OCTOBER

09.00	Paper Division
10.45	International Trade Council
12.00	Plastics Division
14.00	Ferrous Division
15.30	Electrics, Electronics & EV Batteries Committee

Recycling: The Smart Circular Way in Economic Activity

Brigitte Weber
Editor-in-Chief

Worldwide, an increasing number of countries recognize the benefits of recycling. Therefore, it is not by chance that the organizers of the BIR World Recycling Convention & Exhibition in Singapore will once again welcome an enormous number of attendees. The international event will take place from (27) 28 to 29 October 2024. It can be assumed that it will build on the success of the previous conventions organized by the Bureau of International Recycling (BIR), especially the one in Copenhagen (Denmark) this May with 1,780 registrations. In Singapore, as always, at this two-day event participants can expect the latest market insights and topics in the global recycling industry provided by BIR, associations, companies and guest speakers.

New trade formats like the “Circular Valley Convention 2025” in Düsseldorf (Germany) in March next year demonstrate how attractive the global market for the circular economy is. As announced, this event will be organized by Messe Düsseldorf in cooperation with the German non-profit Circular Valley Foundation and with scientific support from the renowned Fraunhofer Institute for Environmental, Safety, and Energy Technology (UMSICHT). As a platform for the circular economy, the convention will bring together decision-makers and experts from business, academia, politics, and society in one place, the organizers underlined (page 7).

Solutions for waste and wastewater management are in demand. That applies to developing countries where the rapid population growth and increasing economic activity are combined with mountains of refuse and pools of wastewater. Regarding waste, for example, the Republic of Mozambique is presumed to generate an amount of at least 4.2 million tons per year. But recycling rates are low. While an estimated 40-60 percent of the waste is collected, about 98-99 percent of this collected quantity is disposed of in uncontrolled landfills. Nevertheless, there are projects to improve the situation as you can read from page 22 onward.

In Europe, for example, Italy is on track to reach the 2025 targets. As you can read (page 29), with 175 million tons produced, Italy shows the fourth-highest amount of waste but has one of the highest recycling rates in the EU. In 2021, the country recycled at least 51.3 percent of its municipal waste. According to the latest report of the Fondazione per lo Sviluppo Sostenibile (Sustainable Development Foundation), the country even recycled 72 percent of all waste collected – compared to the European average of around 58 percent.

The ongoing success of the global circular economy depends on the innumerable companies in the recycling industry and their initiatives. You can find more information in this Enterprises section from page 11 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: SENNEBOGEN Maschinenfabrik GmbH

AFRICA OFFERS MULTIFARIOUS OPPORTUNITIES TO INVEST

Investors looking for business chances in Africa can seek support in the selected country – or engage a service provider with a wide range of offers. Africa Events Limited (AEL) and its sister company African Investments Limited (www.africaninvestments.co) operate three business platforms matching Africa's business, trade and investment opportunities at scale, the companies pointed out on their homepages.

- AFSIC – Investing in Africa, "perhaps Africa's most important investor event" – takes place annually in London. "It is attended physically by many of Africa's largest investors, most significant companies, and Africa's leading Regional and National Trade and Investment Promotion Agencies," AEL informed.
- AFSIC African Investments Dashboard, a fintech platform "originating Africa's largest and most attractive investment opportunities and matching them to regulated institutional investors with a mandate to invest in Africa".
- Africa Business Opportunities Dashboard, a fintech platform matching business, trade, and investment opportunities across Africa covering all business products, sectors, countries in Africa and multiple business objectives. "Customers joining the Africa Business Opportunities Dashboard join one of Africa's most dynamic business communities."

According to AEL, these platforms won the 2022 Global Salesforce Innovation Award for Financial Services. "Salesforce is the 60th largest listed company in the world, and one of the leading tech companies globally." As underlined, Africa Events Limited works with major National Trade and Investment Promotion Agencies, and Governments to promote African business links. "As an example in support of Prosper Africa goals of increasing two-way trade and investment between the United States and Africa, Africa Events Limited has been engaged to significantly increase US exports to Africa, as well as to assist building new supply chains from Africa to the US. Prosper Africa is a whole-of government initiative that leverages the services and resources of 17 US Government Agencies," the company gave account.

The event AFSIC – Investing in Africa

"AFSIC – Investing in Africa" (October 7-9, 2024, in London) is the "largest annual Africa investment conference taking place outside Africa". According to the organizers, the conference and expo would strongly focus on results: making African investment decisions, originating and executing transactions, and raising debt or equity capital were the key objectives for delegates attending AFSIC. The program "is designed to provide delegates with multiple opportunities to access the best African investments, whether through presentations from many of the most experienced Africa investors, or through attending the many formal and informal networking sessions during the event."

More than 350 speakers and 1,500 investors, dealmakers and business leaders were expected to attend this year's event, the organizers said on their homepage. The event would "showcase the most attractive Africa investment opportunities from around 40 African countries, representing all regions in the continent, as well as country sessions and sector-focused workshops that would allow a deep dive into a wide range of African investment opportunities in Africa's

About African Investments Limited

African Investments Limited is a Jersey-registered company that promotes and connects African investment, business and trade opportunities through digital platforms and events. The company underlines that it has built up one of the most important Africa Business Communities. The team would combine their "digital business with running many of Africa's most important business, trade and investment events". As promised, most of the services are free.

In addition to the companies that African Investments Limited manages, it runs three digital platforms, which incorporate portals designed to assist the growth of business and investment across Africa:

- africaninvestments.co
- afsic.net
- invest-in-africa.co

Source: Gordon Johnson / pixabay.com

most exciting economies, as well as profiling the best Africa investors".

Activator HQ: Supporting entrepreneurs

As described on its homepage, Activator HQ is a market intelligence and capacity development platform "that supports entrepreneurs with the insights, training, and guidance they need to succeed in Africa's promising (but difficult) markets". As emphasized, it "actively tracks Africa's Top 100 Business Opportunities". An example of the company's offer spectrum is "Waste & Recycling Business Ideas for 2024: Africa's top opportunities", a guide exploring 20 of Africa's "most lucrative opportunities" in waste recycling and the circular economy. Interested persons who join the Activator HQ Membership get full access to its "business ideas for 2024, funding opportunities for new and existing businesses, investor profiles, and other exclusive insights", the company promises.

activatorhq.com/membership/

FUEL FROM PLASTIC

Fuelre4m promotes Styrex, according to the company "the world's first revolutionary solution to the polystyrene crisis".

According to the company, headquartered in the United Arab Emirates (UAE), Styrex is not just a new product. "It is a global first, revolutionizing how we manage and repurpose polystyrene waste", a press release said. Fuelre4m would already be in discussions with leading global businesses, and the interest would be significant.

"Polystyrene, commonly known as Styrofoam, has long plagued our environment as a persistent pollutant," Fuelre4m emphasized. Every year, approximately 14 million tons of polystyrene waste are generated worldwide, yet recycling rates remain low. That kind of plastic would account for roughly 30 percent of global landfill volume.

As underlined, Styrex would harness "cutting-edge nanotechnology to convert polystyrene into a valuable, sustainable resin, marking a seismic shift in waste management practices".

The process

As described on the company's homepage, there are three phases:

- The organic process: Utilizing natural vegetable esters, Styrex would dissolve polystyrene without the need for harsh chemicals or environmentally damaging procedures. "This organic approach not only ensures that the process is safe and sustainable but also minimizes the carbon footprint associated with polystyrene disposal," Fuelre4m assures.
- The molecular breakdown: As underlined, the core of Styrex's innovation lies in its ability to perform a molecular breakdown of polystyrene. "Through advanced nanobiotechnology, Styrex disassembles the long polymer chains of polystyrene at a molecular level, effectively reducing it to a basic resin form. This meticulous breakdown ensures that the polystyrene is completely transformed, eliminating the risk of residual microplastics that can further contaminate the environment."
- The residue formation: Once the polystyrene undergoes its molecular breakdown, the process facilitates the formation of a dense, energy-rich residue. "This residue is not merely a byproduct but a valuable resource that can be harnessed for energy production." This kind of fuel could be utilized in various energy applications.

The UAE would be the first country to adopt this technology. "Fuelre4m invites businesses and governments to join this revolution in waste management and energy production," the company encourages interested parties. As reported on its homepage, the company is convinced that the full potential of Styrex requires strategic partnerships across industries and sectors. Therefore, it is actively engaging with global hospitality chains, educational institutions, and environmental organizations to establish robust recycling and collection programs for EPS waste. "By incentivizing participation through carbon credits and aligning with Net Zero Carbon initiatives, Fuelre4m seeks to accelerate the adoption of Styrex and advance sustainable practices on a global scale."

fuelre4m.com

Photo: Fuelre4m

CLOSING THE E-WASTE CIRCLE WITH GREEN HEAT

The digital revolution has an impact on the physical world. A massive uptick in the use of electronic devices has led to high demand for critical materials and extremely resource-intensive manufacturing – for every kilogram (kg) of electronics produced, 25kg of CO_2 are released into the atmosphere. Rapid shifts in consumer taste and technological performance have also led to increased electronic waste (e-waste). E-waste is the fastest-growing type of refuse in the world and one of the most toxic to individual and environmental health.

However, although the technology may grow old and outdated, individual components often retain their value long after a smartphone has gone dark, making a case for recycling. It is estimated that the total value of raw materials – like plastics, copper, iron, aluminum, cobalt, nickel, tin, lead, zinc, and precious metals gold and silver – that can be recycled from e-waste is over 54 billion Euro per year. Recycling these materials can provide a valuable economic opportunity and boost the circularity of the electronics industry, but the recycling process is also heat and energy intensive. To be truly circular and sustainable, the electronics recycling industry needs physical solutions to decarbonize its heat and energy use.

Opportunities and challenges in e-waste mining

The process of reclaiming valuable raw materials from discarded electronics is called “e-waste mining”, also known as “urban mining”. It offers a literal and proverbial gold mine for countries and industries willing to invest in making the process more efficient and environmentally friendly. Recycling e-waste is also crucial to combating the scarcity of rare earth minerals and precious metals and contributing to a circular economy – including the energy economy, which increasingly relies on these raw materials to produce technologies such as solar panels.

Currently, e-waste mining faces challenges in finding efficient, eco-friendly methods to extract the raw materials for recycling. Experimental techniques like supercritical fluid, molten salt, and bioleaching show promise, but need further development to balance cost-effectiveness with value. However, existing recycling processes like pyrometallurgy have proven to be extremely effective in recovering precious metals from e-waste. These processes currently produce high levels of greenhouse gas emissions, largely due to using fossil fuels for high-temperature heat. A new way to provide this heat carbon-free is therefore needed to make e-waste mining sustainable.

The heat needed to turn e-waste into gold (and silver, and platinum…)

In the pyrometallurgical process, e-waste is run through shredders or grinders, which break the metal by-products into smaller particles. The next step is smelting the shredded mass using either flash or batch furnaces. This process results in separated metals, leftover slag, and flue gasses. From here, pyrometallurgy becomes a more varied process depending on the facility and the primary metal makeup of the separated metals:

- Primary iron loads can be further separated by oxygen and electrical arc furnaces
- Copper and lead loads can be separated by smelting furnaces
- Aluminum loads can be separated by tilting or stationary melting furnaces

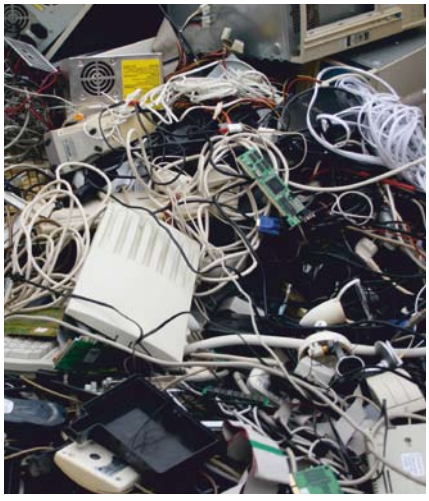

Photo: O. Kürth

A common factor between these different separation methods is the high heat requirement. The process of pyrometallurgy, depending on the exact method, requires sustained heat between 400°C and 1200°C. For example, copper smelting, which introduces sulfides to facilitate separation, requires 1200°C, while lead smelting using blast and imperial smelting furnaces requires a lower temperature between 400°C and 800°C.

Waste not, want not: Enabling electrification and waste heat reuse with thermal storage

This heat is generated mostly by fossil fuels, partially canceling out the positive effect of recycling used materials by emitting large amounts of CO_2 and other greenhouse gases (GHGs). However, there are a growing number of options to replace fossil fuels with clean energy sources in these high-temperature furnaces. The most economical option is clean electricity. To ensure availability and to acquire electricity at low prices, new storage technologies for heat meet the demand for batch furnaces better than direct electrification. A power-to-heat thermal storage system, which converts renewable electricity into heat, can operate many existing furnaces without costly infrastructure changes.

These technologies can also be used for storage and reuse of the hot flue gas to preheat scrap or furnaces. The high level of consistent heat required for pyrometallurgy in recycling e-waste is the primary obstacle to making the technique the best industry option for urban mining. Capturing heat from smelting furnaces, especially in batch processes, and storing it until the next work cycle could dramatically lower GHG emissions and save recycling plants from burning excess fossil fuels. As the demand for precious metals increases, recycling these materials can raise potential revenues and lower GHG emissions. Electronics have become an indispensable part of everyday life; recycling the last generation's technology is therefore necessary to curb their impact on the planet. For a sustainable digital transition – and a successful circular economy – green heat solutions for recycling should be included in e-waste mining today.

kraftblock.com

■ Author: Martin Schichtel, Founder and CEO Kraftblock

Strategic Move:

CIRPLUS EXPANDS TO INDIA

The European platform for recycled plastics procurement, Cirplus, has announced its strategic expansion to India. The goal is to supply the growing demand for recycled plastics in India and the broader Asian markets. Furthermore, there are different business opportunities.

As reported, Cirplus' subsidiary will be based out of Mumbai and led by Ramesh Parasuraman, who brings 30 years of experience in the plastics industry. Currently, he serves as Founder & Managing Director of Allied Solutions India and President of the Society of Plastics Engineers India.

With this strategic move, the German-based organization aims to focus on increasing the availability and quality of recycled plastics globally as well as driving the transition from virgin to recycled materials, the press release underlined. "India has recently introduced progressive regulations for plastics, creating a favorable business environment for recycled plastics whose ambition surpasses the EU's. Under these new regulations (Plastic Waste Management Rules 2022 and India Plastic Pact), producers, importers and brand owners are required – inter alia – to significantly increase the use of recycled content in all types of packaging sold on the Indian market, encompassing the full scope of packaging from rigid to flexibles to multilayered and mandating targets between five and 30 percent as early as 2025. These new frameworks are intended to boost the swift transformation of companies to shift away from virgin plastics and offer investors a reliable framework to build up new and improved capacities in recycling."

Digital solution + services + business opportunities

"We are excited to bring our digital procurement solution to the Asian market and support the transformation of the plastics recycling landscape at a global scale", Christian Schiller, CEO and founder of Cirplus, was cited. "With the expansion, we will not only address one of the most pressing environmental challenges but also create significant opportunities for businesses and communities across India and Asia. With our proven model and expertise for digitally enabled sourcing of post-consumer and post-industrial recycled plastics, we offer brand owners and converters around the world a comprehensive, convenient and cost-efficient way of meeting their procurement targets."

The Cirplus Team

Photo: Cirplus

As in Europe, the company intends to provide services, including supplier matching, material aggregation and qualification, logistics, and quality control "to help plastic processors access high-quality recycled plastics at scale in reliable quantities". The company would further leverage its expertise "in standardizing recyclates as the initiator of the world's first standards on high-quality recycling and digitization, DIN SPEC 91446/EN 18065, and its proven track record of creating the digital infrastructure necessary to manage even more complex material streams, introducing Digital Product Passports that comply with the most recent European legislation."

cirplus.com

Circular Valley Convention 2025:

A NEW GLOBAL PLATFORM FOR THE CIRCULAR ECONOMY

March, 12 – 13, 2025, Düsseldorf (Germany)

The "Circular Valley Convention" is a new trade fair format organized by Messe Düsseldorf in cooperation with the German non-profit Circular Valley Foundation and with scientific support from the renowned Fraunhofer Institute for Environmental, Safety, and Energy Technology called UMSICHT. As a central global platform for the circular economy, this event brings together decision-makers and experts from business, academia, politics, and society in one place.

The circular economy relies on reuse, recycling, and innovative business models extending product life cycles. As underlined by the exhibition corporation, the convention would look at the circular economy "from a holistic perspective: across industries and materials – and all phases of the circular economy, from smart circular design to the reuse and further utilization of products". Its motto: "Uniting Industries for a Circular Tomorrow".

Circular economy in three dimensions

"The Circular Valley Convention covers all phases of the circular economy: from the use of renewable raw materials to product design, manufacturing, logistics, and operations all the way through to collection, sorting, and recycling, featuring solutions for different material classes and value chains," the organizers announced in a press release. "The convention combines applied research and practice and is a content hub for top decision-makers and experts." With the guiding theme "Enabling Circular Economy", the focus would be on three central topics:

- Enabling Value Chains: The implementation of efficient, sustainable, and cross-industry circular solution strategies to maximize the use of resources and make business models fit for the future.
- Enabling Technologies: The transfer of circular competencies such as redesign, refurbish, remanufacture and recycle. The goal is to optimize products and processes using technologies that comply with the principles of the circular economy.
- Enabling Materials: The promotion of the efficient use and recycling of various materials, aiming for the extension of product lifespans and the integration of cross-material circular strategies for the sustainable use of resources.

Conference, expo and more

According to the information, the Circular Valley Convention offers a three-part event format consisting of a conference, an expo, and an exclusive networking event. "Over 100 high-caliber speakers are scheduled to attend the conference. More than 130 exhibitors and partners are expected to attend the expo, the marketplace for future-oriented circular solutions, which offers insights into new trends, innovations, and best practice examples," the organizers are convinced.

Whether exhibitor, partner, or participant: spaces for booths and tickets for the Circular Valley Convention are now available. "For partners and exhibitors, the convention offers attractive packages with different stand sizes and marketing services tailored to the needs of partners and companies," Messe Düsseldorf informed. "Visitor tickets are all-inclusive and offer full access to all areas of the convention: the conference with two stages, the expo and the start-up area, as well as the exclusive evening event on March 12, 2025, with an inspiring program. A high-quality catering offer is also included and will be provided throughout." As underlined, through November 15, 2024, there is an early bird discount on the ticket price (549 Euro instead of 649 Euro for the Corporate Ticket and 449 Euro instead of 549 Euro for the Science Ticket).

cvc-duesseldorf.com/#convention

Source: Messe Düsseldorf

INCREASING DEMAND FOR PLASTIC RECYCLING MACHINES

The global plastic recycling machine market is experiencing strong growth due to rising environmental awareness, supportive government policies, and technological innovations, AstuteAnalytica India Pvt. Ltd. stated. According to the report, this market is projected to reach a valuation of 5,342.2 million US-Dollar by 2032 (from 3,127.3 million US-Dollar in 2023).

As underlined by the company, the economic potential for the plastic recycling machine market is immense, given the current inefficiencies and growing need for sustainable practices. The US, recycling only around five percent of its plastic waste, would export 74,000 containers of plastic waste annually. "Recyclers estimate they could double current recycling rates with better infrastructure. This underscores the demand for advanced recycling technologies, despite current challenges with cost and effectiveness. Companies like Exxon are investing in 'advanced recycling' plants, though more innovation is needed to make these technologies viable and less harmful. The concept of the circular economy is gaining traction, with an emphasis on reusing materials and implementing sustainable packaging solutions." Furthermore, the market growth is driven by increased consumer awareness and legislative actions. Extended Producer Responsibility (EPR) programs and minimum recycled content standards are pushing producers to be more accountable. "Public opinion strongly favors stopping the sale of single-use plastics, with 84 percent of people concerned about microplastics and their health impacts. The US's 'National Recycling Goal' aims to recycle 50 percent of waste by 2030, further necessitating advanced recycling machinery. With green financing and investment supporting infrastructure, the revenue potential for plastic recycling machines is substantial. Replacing virgin plastic with recycled content can save up to 70 percent of production energy, presenting a compelling case for investment in this sector."

astuteanalytica.com/request-sample/plastic-recycling-machine-market

GLOBAL CARBON BLACK MARKET SIZE EXPECTED TO RISE

According to Canada-based Precedence Research, the global carbon black market size is predicted to increase from 19.45 billion US-Dollar in 2023 to approximately 34.83 billion US-Dollar by 2033.

As reported, the carbon black market encompasses the global industry involved in the production, distribution, and utilization of carbon black, a fine black powder composed of elemental carbon. "The incomplete burning of coal tar, vegetable matter, or petroleum products results in carbon black production," the research firm explained. "It is a kind of Para crystalline carbon characterized by a low concentration of polycyclic aromatic hydrocarbons (PAHs) and a high surface-area-to-volume ratio." Paints, tires, and reinforcing fillers include carbon black. "It is also used as a food coloring. Cars, inks, coatings, polymers, and electronics all include carbon black. In addition, it finds application in resins and films, photocopiers, laser printer toners, and radar-absorbent materials."

Asia Pacific dominated the market with the largest revenue share of 63.64 percent in 2023, the information said. In this part of the world, the market size was valued at 12.38 billion US-Dollar in 2023 and is expected to surpass around 22.64 billion US-Dollar by 2033, at a CAGR (compound annual growth rate) of 6.2 percent from 2024 to 2033. Here, carbon black is becoming more popular "because of its advantages in heat dissipation, handling, tread wear, fuel efficiency, and abrasion resistance. In the rubber industry, it serves as a filler to enhance intermolecular forces and provide reinforcing effects."

As underlined by the worldwide market research and consulting organization, China is the world's largest user of carbon black. The country's coatings industry would expand quickly, and the country's building, automotive, and industrial sectors were probably going to fuel this growth. Throughout the projection period, this is anticipated to increase demand for carbon black.

North America is observed to grow at the fastest rate, Precedence Research informed. Companies were investing in technological advancements in carbon black production, focusing on enhancing efficiency, reducing environmental impact, and developing specialty grades tailored to specific applications.

precedenceresearch.com/sample/2785

THE GLOBAL PAPER-BASED LAMINATE MARKET

Will the revival of the construction sector benefit the paper-based laminate market, asked Future Market Insights Global and Consulting Pvt. Ltd., and published a new market outlook.

The global paper-based laminate market, valued at 603.4 million US-Dollar in 2024, is expected to reach 876.2 million US-Dollar by 2034. Emerging economies like India, China, Brazil, and the United Kingdom are generating significant demand for these laminates in construction, retail, healthcare, furniture manufacturing, interior design, marine and recreational vehicle industries, and office and educational environments. “The demand for visually appealing and durable interiors in these sectors is also accelerating due to the rise in retail and commercial spaces,” FMI noted. “Healthcare facilities are also increasingly utilizing paper-based laminates due to their hygienic properties and aesthetic versatility.”

Adopting these laminates is expected to reach unprecedented levels in the coming years, as governments invest billions in initiatives to include their vast population, the information said. The market is also expanding in marine and recreational vehicle industries and interiors, office and educational environments.

Production of eco-friendly paper-based laminates is anticipated to present manufacturers with lucrative growth opportunities to enhance the existing customer base and augment market value share. Such laminates may be used right away on surfaces like doors, walls, multifunctional furniture, stands, and show booths. “Companies in the paper-based laminates market should focus on innovation and sustainability.

Investing in advanced manufacturing technologies and developing eco-friendly products can attract environmentally conscious consumers. Strategic partnerships and collaborations can also drive market penetration and innovation”, Lead Consultant Ismail Sutaria in Packaging at Future Market Insights (FMI) was quoted.

futuremarketinsights.com/reports/sample/rep-gb-4449

TURBODEN CONTRIBUTES TO GRID INDEPENDENCE FOR FIRST NATION COMMUNITY

Italy-based company Turboden S.p.A., a Mitsubishi Heavy Industries (MHI) Group Company, had a role in achieving grid independence for the remote community of Opitciwan in Canada.

Using a 4.8 MWe ORC biomass power plant, the company – a worldwide leader in Organic Rankine Cycle (ORC) technology – contributed to a Biomass Cogeneration Plant Project, supported by Hydro-Quebec and owned by the Conseil des Atikamekw Opitciwan. "The Opitciwan community, a proud First Nation, has long sought a sustainable and reliable energy solution to replace their outdated diesel generators," Turboden reported. Its ORC technology offers a solution, utilizing local wood residues such as bark and sawdust as primary fuel. "This biomass is combusted in a thermal oil boiler, generating heat that is transferred via a closed thermal oil loop to the ORC turbo-generator, producing clean electricity for the community." The technology would allow the community to be independent from the grid to produce electricity for local consumption. Still, it can generate excess electricity beyond its consumption and sell it through PPA (Power Purchase Agreement).

turboden.com

Recofloor:

15 YEARS OF VINYL FLOORING RECYCLING

Recofloor, the UK's leading vinyl take-back scheme, celebrated 15 years of recycling waste vinyl flooring in 2024.

As reported, an estimated 7,250 tons of waste vinyl flooring have been collected and recycled through Recofloor since it was founded by the flooring manufacturers Altro and Polyflor in 2009. "To date, the sustainable collection service for commercial waste vinyl flooring has produced 8,504 tons of carbon savings – equivalent to taking 2,220 cars off the road for a year." It would also equate to 2,416,667 square meters of vinyl flooring having been recycled back into new flooring as well as traffic management products.

Photo: Recofloor

The carbon savings estimate is based on displacing concrete in traffic management products, the main application for recycled flooring.

recofloor.org

USA:

HEIDELBERG MATERIALS ACQUIRED CONCRETE RECYCLER

In July, Heidelberg Materials North America acquired all assets of Aaron Materials, an established concrete recycler and materials producer in the Corpus Christi area (Texas). The operations include concrete crushing, stabilized materials, and a volumetric concrete business.

"The acquisition of Aaron Materials further strengthens our existing materials footprint in Texas and accelerates our focus on recycled concrete and circular solutions," Chris Hobby, President of the Southwest Region for Heidelberg Materials North America, was quoted. As reported, this acquisition is aligned with the company's strategic focus on optimizing its portfolio in core markets and strengthening its existing businesses through acquisitions while advancing its focus on sustainable and circular products.

heidelbergmaterials.us

Goal:

FRENCH-CHINESE PARTNERSHIP TO BUILD PET BIORECYCLING PLANT

In June this year, France-based biotech company Carbios and Chinese Zhink Group announced the signing of a joint Letter of Intent to build a biorecycling plant in China using Carbios' enzymatic depolymerization technology to serve the global market.

This agreement would officialize collaboration towards a long-term partnership given a first licensing contract to build a plant with a minimum annual processing capacity of 50,000 tons of prepared PET waste. It would contribute to accelerating a circular economy for plastic and textiles, a press release underlined. "China, as the leading producer of PET in the world, is a key market for Carbios, and this agreement would establish a presence in this dominant market."

China annually produces 67 million tons of PET, which corresponds to 61 percent of the global production, the information said, referring to HIS Markit 2021, Market Research Future 2021. With regional and international demand for recycled PET growing, China would also have the potential to take the lead in recycled PET (r-PET) production. In 2021, 58 percent of the world's r-PET was consumed in Asia (with 38 percent in China) underscoring this region's importance both as a major producer and consumer.

According to the information, China is as well a key transformer of PET into resins and fibers used in numerous applications in the packaging and textile industries. "Most notably, China is the primary country for transforming PET into fiber, representing 78 percent of all PET fiber transformation in the world". Sustainability and the "dual carbon" policies were considered as main drivers for the Chinese PET recycling industry (the government's guidelines to establish a waste recycling system: https://english.www.gov.cn/policies/latestreleases/202402/09/content_WS65c5ea15c6d0868f4e8e3e8a.html).

Strategic partnership for Zhink and Carbios

As reported, for the Chinese partner, the strategic focus is on developing two global industries, PET and textiles, and to be a leader with sustainable competitiveness. Zhink would be a major actor within the PET market with an annual production of three million tons of PET, serving domestic and global markets. Carbios had developed an enzymatic depolymerization technology "that enables efficient and solvent-free recycling of PET plastic and textile waste into virgin-like products". The initial agreement between the two groups would allow Zhink to increase its recycled PET capacities and meet its sustainable competitiveness objectives. As emphasized, the circular recycling solution "can process all types of PET waste including hard-to-recycle waste (such as opaque and colored bottles, multilayer food trays and textile waste) while reducing CO_2 emissions by 57 percent compared with virgin PET production".

For Carbios, this agreement would mark a significant step in deploying its technology worldwide and the roll-out of its licensing model to achieve its ambition to become a leading technology provider in recycling PET by 2035. "This Asia-based plant under license by Zhink would come in addition to the world's first industrial-scale enzymatic PET recycling plant, which

Emmanuel Ladent, CEO, Carbios (fifth from right) and Zhu GuoYang, President of Zhink Group (fourth from right) surrounded by their teams at Zhink Group's Headquarters in Hangzhou, China

Photo: Carbios

is currently under construction in Longlaville, France." Furthermore, the opening of official discussions with Zhink for a licensing agreement marks an important milestone in Carbios' market entry into China. Since its inception, the French group has proactively protected its innovations in all key regions of interest. "With China considered as a major market, all of Carbios' families of patents own one or more titles in this country. For its PET bio recycling technology, Carbios currently has 28 titles in force in China covering both the industrial process and the enzymes used (including variants that will be used in the industrial process)."

carbios.com
zhink.cc/index-en.html

PRÄZISORT SUPPORTS PLASTICS SEPARATION

Pforzheim University and the technology company Polysecure want to develop a new sorting technology for the recycling of plastics and other materials: "Sort4Circle" is the acronym of the technology that has emerged from consistent research and development and is now to be demonstrated as a pilot plant in Freiburg (Germany). The aim is to significantly increase the recycling rate of plastic waste.

According to Polysecure, in the development project, which is funded by the state of Baden-Württemberg as part of the Invest BW funding line, the state-owned Umwelttechnik BW GmbH is also involved as an associated partner to support the marketability and exploitation of the results in addition to the technical development.

The technology

"The patented Sort4Circle technology differs fundamentally from today's sorting processes, which are primarily aimed at packaging plastics and the separation and concentration of a small number of material groups," the German company pointed out. "Sort4Circle, on the other hand, makes it possible for the first time to quickly and precisely identify individual packaging and other sorting objects and assign them directly to very pure and therefore better recyclable material groups."

The technology would implement three central innovations: Continuous object singulation, combined with precise detection and correct object placement into a flexible number of fractions. As reported, a newly developed detector module simultaneously measures material characteristics such as color, image, polymer type (using NIR technology) and fluorescent marker, which enables reliable sorting into pure fractions. "The tracer-based sorting (TBS) technology patented by Polysecure, which uses fluorescent additives to ensure reliable identification of objects regardless of their composition, is thus also being pursued further."

While Polysecure is developing and building the pilot system, Pforzheim University is generating economic, technical and ecological data for the recycling of plastic streams, the information said. "In addition, the project consortium is conducting a Germany-wide collection and sorting study in order to analyze the quality and quantity of the plastic waste generated and to generate basic design data for the further development of the Sort4Circle process." The project will run until September 2025.

polysecure.eu/
hs-pforzheim.de/en/research/research_institutes/inec/projects

Photo: Polysecure

WELTEC BIOPOWER MODERNIZES BIOGAS PLANT IN AUSTRALIA

German plant manufacturer Weltec Biopower supported Australian company Yarra Valley Water in refurbishing its one-megawatt biogas plant in the north of Melbourne.

Yarra Valley Water's plant has won prestigious awards for its technology

Photo: Weltec Biopower

Yarra Valley Water is one of Australia's largest water and wastewater companies. Since the completion of the waste and food waste plant by the German firm and its project partner in 2017, Yarra Valley Water's Aurora Treatment Plant has been energy self-sufficient. To operate the plant profitably into the future, it has been undergoing a technical modernization, including biological service planned for August 2024. The work of the local team was supported by Weltec Biopower on-site.

At the start of the maintenance work, the tanks were completely emptied, the German manufacturer described the procedure. In addition, the roofs of the two 3,573 cubic meter stainless steel fermenters and internal plant components such as the agitator technology have been replaced. Then the plant was commissioned, and operational management was secured. The digester contents have been temporarily stored in the storage tank for the material to be filled back into the tanks after the refurbishment. In this way, the plant could be up and running quickly. As underlined, this saves resources and costs. In addition, it is easier to restart the biological process when the fermented material is immediately available. Finally, yet importantly, "the processes also comply with occupational safety requirements, which are a high priority in Australia – especially when emptying and filling the tanks", Weltec Biopower gave account.

The plant and its capacity

The plant's output, which has two 530-kilowatt combined heat and power (CHP) units, covers the energy requirements of the biogas plant. "The electricity generated is able to power both the facility itself and the sewage treatment plant, with excess energy is exported to the electricity grid. The plant has a processing capacity of 33,000 tons of organic waste from food processors and restaurants to generate around 7,500,000 kilowatt hours of energy per year", the information said. "Accepted waste includes fats, oils, brewery and dairy residues, fruit and vegetables, which are fed into the stainless-steel containers."

As underlined, Yarra Valley Water's facility has already won prestigious awards for its technology, including the Premier's Sustainability Award for leading innovation and practice in Victoria and the Banksia Award for Leading in Circular Economy.

weltec-biopower.com
yvw.com.au

USA:

NEW WASTE-TO-ENERGY PLANT TO BE BUILT

The Miami-Dade County in Florida needs a new waste-to-energy plant and the AtkinsRéalis Group Inc. will advise the county on its plans for a new facility. As reported in August, the Canada-based company with offices worldwide has been awarded a Professional Services Agreement (PSA) to provide engineering services to the Miami-Dade Department of Solid Waste Management for its new state-of-the-art plant. “Capable of processing 4,000 tons of waste per day, the project will create the largest WTE facility in the United States”, the information said. Under the ten-year contract worth 65 million US-Dollar, AtkinsRéalis will provide design criteria, consulting, advisory and environmental services before construction. The company would also supervise construction and administer quality control support to Miami-Dade County. As underlined, AtkinsRéalis has delivered 23 alternative fuel projects in North America since 1982, including three in Florida.

Source: AtkinsRéalis

atkinsrealis.com

THE GLOBAL NUTRIENT RECYCLING MARKET WILL EXPAND

As reported by the India-based company Spherical Insights & Consulting, the Global Nutrient Recycling Market Size is to grow to 8.4 billion US-Dollar by 2033 (from about 4.83 billion US-Dollar in 2023), at a compound annual growth rate (CAGR) of 5.69 percent during the projected period.

“The breakdown of organic waste and subsequent conversion of nutrients back into forms that may be taken by living things, including bacteria, plants, and animals, is known as nutrient recycling,” the market research and consulting firm explained. “Reusing biological waste from municipal, industrial, and agricultural processes is known as nutrient recycling.” According to the definition, animal waste as well as industrial and urban trash are acceptable organic sources. “The two main nutrients that are recycled are phosphate (P) and nitrogen (N), as the latter can be utilized instead of chemical fertilizers, reducing the amount of fossil P resources extracted and the environmental impact of making nitrogen fertilizer from minerals.” Additionally, people were becoming more conscious of where their food comes from and how its production affects the environment. Consequently, there would be enhanced pressure on food producers to implement sustainable practices to satisfy consumer demands. “By using natural cycles to restore the microbial population, nutrient recycling systems increase soil fertility. Because of the contaminants being reduced, it improves environmental health”, Spherical Insights & Consulting emphasized. “Sustainable agricultural methods, such as recycling nutrients, are becoming more and more popular as environmental concerns over agriculture’s harmful consequences grow. It decreases production costs sustainably and improves soil health.”

Based on the type, the global nutrient recycling market is divided into gaseous cycle, sedimentary cycle, and hydrological cycle. Among these, the gaseous cycle segment is anticipated to hold a significant share of the global nutrient recycling market, the company informs. It improves crop cultivation, is cost-effective, and is a popular seed treatment. Gaseous cycles generally progress more quickly and are better able to adjust to changes in the biosphere than sedimentary cycles. The nutrient recovery from wastewater segment is anticipated to hold the largest share of the global nutrient recycling market during the predicted timeframe.

sphericalinsights.com/request-sample/4750

SUMMA EQUITY ACQUIRES FORTUM RECYCLING AND WASTE

In July, Finnish company Fortum signed an agreement to sell its recycling and waste business to the thematic impact investment firm, Summa Equity through its portfolio company NG Group.

The total consideration on a debt- and cash-free basis is approximately 800 million Euro, a joint press release informed. The transaction is subject to customary closing conditions and is expected to be completed in the fourth quarter of 2024. As reported, the divestment of the recycling and waste business is part of Fortum's strategic review of its circular solutions businesses, which was initiated in August 2023. "Fortum's strategic focus is on delivering clean energy and driving decarbonization of industries in the Nordics. Fortum's core operations are located in the Nordics and consist of CO_2-free power generation, electricity sales, and district heating and cooling. The Circular Solutions businesses are not in the core of the strategy." The recycling and waste business to be sold would comprise municipal and industrial waste management and end-to-end plastics, metals, ash, slag and hazardous waste treatment and recycling services. "These businesses are located in Finland, Sweden, Denmark and Norway and currently employ approximately 900 employees."

After the divestment, Fortum plans to continue the strategic review of its remaining circular solutions' businesses: the turbine and generator services, battery recycling business, as well as ownerships in biobased solutions businesses and a UK-based waste-to-energy business.

About the investor

Summa Equity is an impact investor focusing on three thematic areas: Resource Efficiency, Changing Demographics, and Tech-Enabled Transformation. According to the information, the purpose of Summa is to invest in solving global challenges. The equity firm has approximately five billion Euro in assets under management and has made over 30 platform investments across three funds raised to date.

fortum.com
summaequity.com

NEW PARTNERSHIP IN AFRICAN METALS RECYCLING

The on the African continent active company Romco Group (headquartered in the UK) and Luxembourgian company Elemental Group form a partnership in the metal recycling industry on the continent.

According to the joint press release, the alliance will accelerate and diversify Romco's existing growth plans and reinforce its position as a key player in the global metals recycling industry. It would combine both companies' expertise and resources in collecting, pre-processing, smelting, and trading of recycled base and precious metals.

"The partners will expand Elemental's existing business in spent auto-catalyst recycling, e-waste recycling, and li-ion battery recycling to Africa while accelerating expansion of Romco's existing aluminum and copper recycling operations. Romco has a strong established presence in West Africa, which will serve as an initial base for the partnership," the information said. Combining resources from both partners, the companies would aim to deliver "the most green and sustainable base and precious metals in the world to its customers, using best-in-class ESG standards". Both parties would initially concentrate on producing aluminum, copper, platinum group metals, and by-products such as gold and silver.

Photo: Romco/Elemental

Paweł Jarski, CEO of Elemental Group, and Raymond Onovwigun, founder and CEO of Romco Group (right)

"Romco's vision has always been to lead the way in sustainable metals recycling in Africa, and this collaboration with Elemental will significantly enhance our ability to achieve that goal," Raymond Onovwigun, CEO and Founder of Romco was quoted. Elemental would be a perfect pairing to drive scalability. "By leveraging our combined expertise and resources, we will not only accelerate the expansion of Romco's existing aluminum and copper recycling operations but also introduce innovative processes for other base and precious metals. This partnership exemplifies our commitment to delivering the highest quality secondary metals to our customers while keeping our environmental and social responsibilities front and center."

Pawel Jarski, CEO and Founder of Elemental, also sees the benefits of the alliance. "Romco is the ideal partner for Elemental to start multi-metal recycling in Africa. The opportunity for metals recycling in Africa is immense and through this partnership, we are well placed to help deliver more recycled critical minerals to Africa and the world. Thanks to our partnership with Romco Group, we have the unique opportunity to promptly enter two new, important markets: Nigeria and Ghana. From the perspective of Elemental Group, our presence in Africa is a natural progression in the development of our global structure."

romcometals.com
elemental.biz

A NEW RANGE OF RECYCLED POLYMERS FOR FOOD CONTACT PACKAGING

Versalis (part of the Italian chemical company Eni) and Forever Plast (one of Italy's leading companies in post-consumer plastic recycling) have launched Refence, a new range of recycled polymers for food contact packaging.

"The range is already available in the market for polystyrene applications such as yogurt pots, trays for meat and fish, and other types of rigid and expanded packaging," mineral oil and energy group Eni gave account. The new products would expand the Versalis Revive portfolio of mechanically recycled materials, "redefining their application limits and enabling direct contact with food".

The recycled polymers are produced due to Newer technology, developed in Versalis' research laboratories in Mantua and industrialized at Forever Plast's facilities in Lograto (Brescia) under a co-development agreement between both companies. As reported, the technology used would enable the purification of recycled polymers in compliance with EU Regulation 1616/2022 on recycling. "The technology has also obtained the Non-Objection Letter (NOL) from the US Food and Drug Administration (FDA)."

versalis.eni.com

Plastic to Fuel Market:

THE PROSPECTS ARE GOOD

According to market research and consulting agency SNS Insider, the Plastic to Fuel Market size is projected to reach about 4,098 billion US-Dollar by 2032 from 520.10 million US-Dollar in 2023. As reported, the researchers expect that the market will step up at a CAGR (compound annual growth rate) of 25.78 percent over the forecast period of 2024-2032, because of the "necessity to move to a low-carbon economy and these policies are pushing investments in plastic-to-fuel technologies". For example, in November 2022, internationally active company Klean Industries partnered with RGH Systems Inc. (a subsidiary of REI Global Inc., located in Makati City, Philippines) to develop a waste plastic to energy facility in the Philippines market, SNS Insider pointed out.

Furthermore, government regulations were narrowing their hold on environmental practices. "Policies are pushing for a reduction in plastic waste and a transition towards renewable energy sources. This creates a nurturing environment for plastic-to-fuel technologies to blossom. Finally, advancements in conversion technologies like pyrolysis and gasification are making plastic-to-fuel processes more efficient and cost-effective. This technological leap further propels the market forward."

snsinsider.com/enquiry/4384

MERAXIS PARTNERS WITH POLYMERIZE

Swiss-based company Meraxis, a worldwide active plastics distributor, and the AI deep-tech start-up Polymerize have formed a strategic partnership. Both companies aim to expand their range of services in the European market.

Polymerize – founded in 2020 in Singapore – is a developer and provider of a materials informatics platform specifically tailored to the research and development needs in the polymer industry. Its cloud-based Software-as-a-Service platform would allow converters, producers, and compounders to optimize their materials development and launch new – and more sustainable – products more quickly. With over two billion Euro sales, Meraxis is a leading plastics distributor. In addition to its headquarters in Switzerland, the trade group has around 30 locations worldwide. Meraxis provides its customers with targeted support in the strategic procurement of polymers and polymer-related products: In the one-stop shop, plastics processors obtain standard plastics (e.g. PE, PP, PET, PVC), engineering plastics, masterbatches, recycled materials, and biopolymers. Meraxis also provides capital goods such as injection molding machines, systems and tools as well as aids for upstream and downstream production processes.

polymerize.io
meraxis-group.com

SUCCESSFUL TRIAL WITH PCR RESIN

In July, USA-based company PureCycle Technologies, Inc. reported a successful trial run with MiniFIBERS and Beverly Knits, resulting in the production of several high-quality product samples.

Resin produced from post-consumer recycled (PCR) waste was used by the manufacturer of specialty fiber products MiniFIBERS to create fiber packages. Then, these packages were sent to Beverly Knits, an American textile manufacturer, and used to produce textiles for a broad range of markets including home goods, automotive applications, industrial solutions, and apparel products. "These initial product samples are designed to allow brand owners to feel confident that there will be no compromise in quality when they introduce PureCycle resin into their products", the information said. PureCycle and MiniFIBERS plan to continue testing use cases for other nonwoven applications that could help improve the sustainability of products in the construction, automotive, and appliance industries.

Photo: PureCycle

purecycle.com

Major Aquafin Project:

5 HUBER BELT DRYERS BT FOR THE THERMAL TREATMENT OF MORE THAN 120,000 TONS OF SEWAGE SLUDGE PER YEAR

HUBER SE will supply a total of five HUBER Belt Dryer BT units to the Belgian company Aquafin for the two sites in Roeselare and Beringen. The plants for drying and thermal utilisation of sewage sludge will treat a minimum capacity of 32,500 tons of dry substance or 120,446 tons of original substance with a dry residue (DR) content of 27 percent per year. In addition to the HUBER belt dryers, the scope of supply includes the entire wet sludge logistics, cooling water supply, exhaust air treatment for the dryer and bunker exhaust air as well as the treatment and storage of the dry sludge. The total order for HUBER SE for approx. 40 million Euro was placed in mid-2023.

Project constellation

The project is carried out by a team of three companies:

- Contractor: Stadsbader Group
- Technology partner for sludge drying: HUBER SE
- Engineering and study: Sweco

For the end customer Aquafin, this combines the strengths of a healthy construction company, a specialised technology partner in drying technology and an experienced engineering company with specific experience in the fields of hydraulic engineering, civil engineering, hydrology and (geo) stability. The collaboration between the Stadsbader Group, HUBER and Sweco guarantees high-quality project execution thanks to local roots on the one hand as well as process and technical expertise on the other. After submitting the approval documents at the end of 2023, the environmental permit for the Beringen site was granted after just over six months. The permit for the plant in Roeselare is also expected this year. That means that the engineering phase for this major project is as good as complete and the first work can start on site this year.

20 years, 82 plants and 1.8 million tons of sludge per year

In the last 20 years, HUBER Belt Dryers have processed 1.8 million tons of sludge per year in 82 plants worldwide. With the appointment of HUBER as technology partner, the project partners can draw on decades of practical experience in the supply, installation and commissioning of sludge drying plants. HUBER has already gained regional experience with its drying technology in the Benelux region: one of the largest belt drying plants, probably the largest in the world, is currently being built at the customer HVC in Alkmaar.

Aquafin – current sludge chain

Aquafin is a Belgian company that was founded in 1990 by the Flemish government and is responsible for the inter-municipal infrastructure and treatment of domestic wastewater. Every year, it produces around 350,000 tons of dewatered sludge with an average dry residue of 27 percent. The disposal of this sludge is currently organised via three disposal routes: One third of the sludge is dried using residual heat and fossil fuels and then utilised externally in the cement industry (co-incineration). One third is dewatered and processed under autothermal conditions in the sewage sludge recycling plant in Bruges. The remaining third is also dewatered and thermally recycled together with industrial waste by an external company.

Aquafin – new sludge chain

From 2026, Aquafin will initially dry up to a third of the dewatered sludge using HUBER Belt Dryer technology as

HUBER Belt Dryer BT 22 in Roeselare

HUBER Belt Dryer BT 28 in Beringen

Photos: HUBER SE

part of its climate and energy targets. That will be done using residual heat that would otherwise be lost.

For this purpose, two largely analogue drying plants will be built in Roeselare and Beringen. The sewage sludge delivered by lorry from around 40 different sewage treatment plants is fed directly into the HUBER Belt Dryers by a crane system from the bunker via a downstream moving floor and thick sludge pumps.

In the Beringen plant, a total of 84,446 tons of dewatered sewage sludge per year are dried from 27 to 90 percent DR at an inlet temperature of 110 °C. Three HUBER Belt Dryers BT 28 are used for this purpose. In the Roeselare plant, two HUBER Belt Dryers BT 22 are used to dry 36,000 t/a of dewatered sewage sludge from 27 to 90 percent DR at an inlet temperature of 90 °C.

The bunker and dryer exhaust air are treated separately, with the dryer exhaust air undergoing a 4-stage cleaning process – with scrubbers, biofilters and downstream activated carbon filters. After drying, the sewage sludge is fed into a pellet press by screw conveyors and a bucket conveyor. The cooled pellets are then stored in dry material silos before being transported to Ghent.

Construction of a mono-incineration plant in Ghent

Aquafin will build a mono-incineration plant on the site of the steel company ArcelorMittal in the port of Ghent by 2026, in which the sewage sludge dried in Beringen and Roeselare will be utilised. ArcelorMittal will purchase 100 percent of the steam generated by the sludge treatment plant. For the steel company, this is an additional source of energy for its internal steam network, further reducing the use of fossil fuels. The direct purchasing of the entire steam production in combination with the focus on raw material recovery (phosphorus) gives the overall project considerable ecological added value. This new plant will be designed, built, financed and maintained until 2046 by the BESIX Indaver consortium.

A prime example of sustainable resource management

With its belt drying technology, HUBER is making a significant contribution to Aquafin's goal of no longer using fossil fuels by 2030 and becoming a climate-neutral company in the long term. In addition, waste heat is utilised directly at the point of origin and the dried sewage sludge is transported to the utilisation site as an energy source. The large-scale Aquafin project is therefore a transferable example of sustainable resource management.

huber-se.com

WATER AND WASTEWATER TECHNOLOGY FROM GERMANY STILL IN DEMAND

According to the German VDMA Process Engineering Machinery and Equipment Association, the international markets were successfully developed in 2023 and the level of exports from the previous year was once again exceeded. Compared to 2022, exports increased by 5.5 percent to almost 1.3 billion Euro. With regard to the development of individual sales regions, there is no uniform picture. As reported, 47 percent of all exports of water and wastewater technology from Germany went to other EU countries; the export volume rose slightly below average by 2.6 percent to 611 million Euro. The equally important customer regions of Other Europe (up 6.5 percent) and North America (up 7.9 percent) also recorded a positive rate of change. The most significant positive changes were recorded in the comparatively smaller sales regions of North Africa (up 55.2 percent), South East Asia (up 54.7 percent) and Central and South Asia (up 50.1 percent). East Asia saw a negative development of 4.7 percent. The sharpest decline was recorded in the Middle East (down 5.5 percent).

vdma.org

NESTE EXTENDS CHEMICAL RECYCLING LOGISTICS INFRASTRUCTURE

Neste is expanding its logistics infrastructure for liquefied recycled raw materials at its refinery in Porvoo (Finland), including materials such as liquefied waste plastic and liquefied rubber tires. According to the company, this lays the foundation for handling larger amounts of liquefied raw materials to support its strategic aims to advance chemical recycling and transform the Porvoo refinery into a renewable and circular solutions hub.

Photo: Neste

Installation of new unloading arm for liquefied recycled raw materials at Neste Porvoo refinery harbor, Finland

The new logistics installations would comprise dedicated unloading facilities: At the refinery's harbor, Neste is building an unloading arm with a heating system as well as pipelines to connect the harbor with dedicated storage tanks. "Unlike regular crude oil, liquefied waste plastic or discarded rubber tires require heating to stay liquid. At the same time, the systems need to come with higher resistance to corrosion." In addition to the unloading arm and pipelines, the company is also building a vapor recovery unit, contributing to emission control of the operations.

"The transformation of our Porvoo refinery into a renewable and circular solutions hub will require many individual steps and adjustments", Jori Sahlsten, Senior Vice President of Refinery and Terminal Operations at the Porvoo refinery, was quoted. "The new logistics infrastructure is one of these steps. It puts us in a good position to process larger and continuous volumes of liquefied recycled raw materials. This will be needed when we start using the new upgrading unit, which is able to process 150,000 tons of liquefied waste plastic per year." The new logistics infrastructure is expected to be completed in 2024. As reported, it will be available when Neste finishes construction of its liquefied waste plastic upgrading unit at the Porvoo refinery, which is currently being built as part of the project PULSE, planned to be finalized during 2025.

At the upgrading unit, the liquefied raw materials are turned into high-quality feedstock for the plastics and chemicals industry.

neste.com

LINDNER EXPANDS TO INDIA

Austrian engineering firm Lindner has continued its expansion with the foundation of Lindner Recycling-tech Bharat (India) LLP with its headquarters in Delhi. Together with Chirag Verma, Co-owner of Lindner Bharat, and Ganesh Karankal, Sales Director of plastics recycling, the aim is to develop sustainable recycling solutions for the waste and plastics industry. "India, with its 1.4 billion people, is the second most highly populated country in the world and is presently the fifth largest economic power," Lindner emphasized. "While about 62 million tons of waste is produced every year and rising, the rate of recycling, which varies depending on the type of waste and region, still has growth potential." A range of initiatives by the Indian government were intended to raise the population's awareness of this issue and help to increase the amount of waste recycled. "However, as well as regulation, recycling requires appropriate technologies so that the wide range of reusable materials – including plastics, electronic scrap, and commercial, industrial and domestic waste – can be fed back into the circular economy."

lindner.com

RECONOMY ACQUIRED ITS FIRST US COMPANY

In August this year, UK-based circular economy company Reconomy announced the acquisition of Lincoln Waste Solutions LLC, a leading US-based waste and recycling management and consulting firm.

According to Reconomy, Lincoln provides a comprehensive, full-service management approach to handle all types of waste and recycling. “Its services include recycling, waste consulting, hauler management and back-office support. Lincoln’s objective is to work closely with its clients and vendors to achieve higher levels of waste efficiency, recycling, sustainability data and cost savings.” The company would have a strong track record of servicing hundreds of clients across the USA, Canada and Puerto Rico.

As reported, the transaction is Reconomy’s first US-based acquisition, “representing an important strategic milestone” for the company and providing it with a platform to accelerate growth in North America. It builds on the company’s existing presence in North America. Through its RLG brand (RLG = Reverse Logistics Group), Reconomy would already provide the technology “that powers the common collection scheme for kerbside recycling in Ontario, Canada”. RLG would also manage the WEEE and battery compliance obligations for some of the largest consumer electronics brands across the USA from its offices in New Jersey.

The acquisition is the third one this year, including Circle Waste (UK) and Sudamin Rohstoff (Germany). Reconomy operates in over 80 countries with over 4,000 colleagues servicing over 10,000 customers.

reconomy.com

Photo: Landratsamt Kitzingen studio zudem / abfallbild.de

MOZAMBIQUE AND THE COUNTRY'S STRUGGLE AGAINST WASTE

It is estimated that the Republic of Mozambique's more than 30 million inhabitants generate at least 4.2 million tons of waste per year. More precise data is not available.

As reported by the Mitigation Action Facility – a platform for providing technical support and climate finance for ambitious mitigation projects to decarbonize key sectors of the economy and society – the number of people residing in Mozambican urban areas has tremendously increased. The population in the country's conurbations rose from 3.3 million in 1990 to over ten million in 2017 alone; this dynamic development continues. However, the rapid urbanization, combined with increasing economic activity, has led to a substantial growth of waste volumes, the Mitigation Action Facility informed. "Reportedly, an estimated 40-60 percent of the waste is collected, although, in practice, collection rates might be lower (20-30 percent). Over 98-99 percent of the collected waste is disposed of in uncontrolled dumpsites with the remaining one to two percent being reused/recycled through informal networks."

Nevertheless, there are projects to improve the situation. From 2024 to 2029, the project "Programme for Sustainable Waste Management in Mozambique" will support the government of Mozambique "in addressing the challenges associated with municipal solid waste management (MSWM) through a comprehensive and ambitious intervention with the final aim of building a circular economy". To do so, the project would promote investments in Integrated Waste Treatment and Disposal Facilities (for instance Material Recovery Facilities and sanitary landfills/composting facilities) in three municipalities, the Mitigation Action Facility wrote on its homepage.

The project is performed in cooperation with the Mozambican Ministry of Land and Environment (MTA). The Belgian Development Agency Enabel serves as an implementation organization, while other project partners are the National

Photo: Liudmila / stock.adobe.com

Fund for Sustainable Development (FNDS) and the National Association of the Mozambican Municipalities (ANAMM). It is planned that the Financial Cooperation (FC) component of the project will consist of public investment in waste infrastructure projects through public procurement and results-based financing grants regarding the quantities of recyclable materials that are being recovered and recycled (only for Material Recovery Facilities).

Furthermore, the project would give technical assistance and capacity development support to the Ministry of Land and Environment and the National Fund for Sustainable Development to create the necessary institutional and technical capacities. The assistance provided by Enabel would also include project preparation activities, institutional capacity development at the municipal level and awareness raising, the Mitigation Action Facility announced. "The target group of the project will be municipal governments. In addition, the project will indirectly benefit an estimated 1,680 waste pickers, micro-entrepreneurs and members of associations and community-based organizations involved in recycling."

For the implementation of the project, three municipalities were pre-selected (Nampula, Nacala and Pemba) based on technical criteria related to the relative readiness of the municipalities in setting up the proposed waste treatment infrastructure and value chain activities. It is expected that the initiative will be co-financed by the Mozambican government. Thus, 700 million Mozambican Metical (about eight million Euro) will be contributed to the construction of MSWM infrastructure and will utilize incomes from the upcoming Environmental Tax on Packaging (ETP), the information said.

The participants expect that the project will result in 88,000 tCO2e (tons of carbon dioxide equivalent) of direct emission reductions and 55,000 tCO2e of indirect emission reductions during the implementation period. By 2030, the total (direct and indirect) emission reductions will have reached 519,000 tCO2e, the Mitigation Action Facility is convinced. This would correspond to approximately 50 percent of the NDC*) emission reduction target for the waste sector in Mozambique.

A digital waste app for plastic recycling

As underlined in the report titled "The Future of Plastic Waste is Circular: The role a digital app can play in making it happen – a Mozambican perspective", published in December 2023, Mozambique generates nearly 700,000 tons of plastic waste annually but only 1.5 percent of that amount is recycled. "The proportion is even lower in rural areas due to a lack of collection facilities. Waste is often burned or dumped on vacant land, and into rivers, lakes and ocean. Meanwhile, over 130,000 catadores (the Portuguese word for informal waste picker or 'scavenger') collect any recyclables such as metals, cardboard, glass and plastics," Africa RISE (Reform for Investment and Sustainable Economies) informed on its homepage.

AMOR, an NGO and Mozambique's leading recycling advocate, approached EU-funded Africa RISE in early 2023 to request support to pilot the digital waste app Kolekt in Mozambique. A team of experts was subcontracted by Africa RISE to implement the initiative. The app was piloted with different target groups including businesses, waste pickers and recyclers.

The project kicked off in March 2023 in Mozambique with an implementation period of eight months. At the beginning of May, the pilot started with the recycler Topack, the only end-to-end plastic recycler in Mozambique. "With the

About the Mitigation Action Facility

According to the Mitigation Action Facility, it is an agile, grant-based multi-donor fund driving sectoral decarburization. It evolved from the NAMA Facility in 2023, as a go-to platform for providing technical support and climate finance for ambitious mitigation projects to decarbonize key sectors of the economy and society. The organization continues to fund ambitious climate change mitigation projects to implement Nationally Determined Contributions (NDCs) and long-term strategies (LTS) that are central to meeting the Paris Agreement goals.

The Mitigation Action Facility primarily focuses on three priority sectors – energy, transport and industry, but remains – by its own account – open to cross-sectoral projects linked to one of the priority sectors. "As highlighted in the IPCC's Sixth Assessment Report, energy, transport and industry cumulatively account for more than 40 GtCO2e, or 67 percent of global annual GHG emissions (as of 2021). To shift the targeted sector towards a carbon-neutral development pathway, the Mitigation Action Facility selects innovative projects that can catalyze sector-wide transformational change".

mitigation-action.org

*) The nationally determined contributions (NDCs) are commitments countries make to reduce their greenhouse gas emissions as part of climate change mitigation. These commitments include the necessary policies and measures for achieving the global targets set out in the Paris Agreement, the free online encyclopedia Wikipedia explains.

Kolekt app, they sought to identify the sources of HDPE, PP and PET plastics, and the collectors. They also wanted to better monitor the buying of plastics and cash management by their truck drivers," the report described the goal.

Therefore, the pilot started with training Topack's staff who receive the deliveries of recyclable material, followed by the drivers of Topack's recycling collection trucks, and those of partner recycling collection agencies. "The vehicles use Kolekt to register their purchases, and Topack uses it for their own purchase of this material."

AMOR also piloted the app at an existing "Eco Point" in the country's capital Maputo that uses municipal land. It is the organization's first installation of this kind and is now run under the microenterprise RLR. The collection point first used Kolekt to register their current stock. "They then used the app to register all purchases and sales of recyclable materials, a system currently being tracked on paper. Kolekt makes it easier for them to track their inventory and register their clients (suppliers)."

In July last year, midway through the project, Africa RISE assessed the pilot and collaborated with 60 Decibels (60dB), a tech-enabled impact measurement company, to gather data. Fifty users with Smartphones from 423 lists of users were selected. As reported, Topack and AMOR used the results to take action and improve the app business model.

The results

According to the report, in six months (from the beginning of May to the end of October) over 5,400 transactions and more than 380 tons of plastic waste have been collected and traded through the app in three regions of the country. Waste pickers also benefitted. The app has made the job easier because they no longer need to "hunt" around town for waste as they used to. Moreover, they earn more money. As reported, more than 73,000 Euro has been generated for waste pickers from transactions through the app, "a more secure, reliable and trustworthy system for the most vulnerable people from the plastics value chain". The app would work well for informal collectors "that have a simple feature phone or even no phone at all. This allows them to receive bonus points, trade, and log in to cash out their points using face recognition with the app installed on someone else's smartphone." In Mozambique, the number of users increased from ten in May 2023 to 423 in July and more than 1,800 users at the end of October 2023.

A further advantage: Over six months "Topack has made over 4,800 transactions and has gained over 1,500 users"; 90 percent were informal waste pickers, and approximately 80 percent were women. Over the same period, AMOR has made 600 transactions at its four EcoPoint buying centers. It has registered 600 new sellers of which the most were informal collectors, mainly women, Africa RISE pointed out.

Business Opportunities

Mozambique is an attractive destination for investments, the Mozambique Investment and Export Promotion Agency (APIEX) underlined on its homepage. According to the information provided by the agency, the country's economy has registered growth in the last decade "benefitting from substantial inflows of foreign direct investment (FDI) into various sectors, notably agriculture and agro-industry, tourism, infrastructure development, energy, fisheries and aquaculture, industry, mineral resources (mainly coal and gas) and banking, among others".

The "Investment Guide", "Mozambique Investment Procedure Guide", "Tax Compliance Guide for Foreign Investors Mozambique" and "Mozambique Business Licensing Guide" can be downloaded at https://apiex.gov.mz/invest/.

About Africa RISE

Africa RISE (Reform for Investment and Sustainable Economies) is a technical assistance facility funded by the European Union and implemented by a consortium led by Landell Mills, with support from Adam Smith Europe, Imani Development and International Economics. It aims to promote business development and improve investment climate in eastern Africa, southern Africa and the Indian Ocean in support of inclusive and sustainable growth, job creation and decent work.

eu-africa-rise.com

Photo: VIVIANE M. / pixabay.com

Mozambique:

ON SEARCH FOR PLASTIC WASTE REDUCTION

While Mozambique's waste management sector, in general, shows the first signs of change, the treatment of plastic waste finds it difficult to leave the disastrous recycling rates behind. The problems already start with fixing the number of generated and handled materials.

A "final report for Mozambique" published by the IUCN and the UN environment program in 2018 suggests an overall import of 258 kilotons (kt) of plastic. Simultaneously three kilotons (kt) of primary and products and one kt as waste were exported; 72 kt changed in stock. Four kt were recycled. 51 kt ended up improperly disposed, and 109 kt uncollected, while 17 kt leaked into the environment. Another study on plastic waste flows in Mozambique conducted by the Institute for Future Initiatives at the University of Tokyo in 2020 shows that 1,470 tons of plastic waste were imported, while 481,260 tons were generated domestically. Finally, 1,225 tons went into export and 9,482 tons into recycling. 315,466 tons of uncollected waste and 144,378 tons of formally collected domestic mixed waste ended in open dumping. Some 7,219 tons were sorted from the open dump, so that 278,089 tons were open burned and 2,848 tons leaked into the ocean. In short: "Over 95 percent of plastic waste end up in open dumps, with about 60 percent open burned and less than 0,5 percent recovered and prepared for recycling or exports", the study judges.

First steps of separation

Anyway: Attempts to tackle the leakage of plastic waste by organizations started in 2006 by a partnership called RECICLA including the Italian lay volunteers association LVIA, Caritas, CAFOD, the Veneto Region (Italy), GTZ-AGRESU, the Netherlands Embassy in Mozambique and the Municipal Council of Maputo. Formally established in 2007, "it is an economically-oriented organization rather than an organization which advocates for the interests of its members", says an Organizing Brief of the network WIEGO. The material – polyethylene, polypropylene, plastic film and bags – mostly came from waste pickers or anyone who brought it. The plastic waste was manually processed by washing, sorting, cutting and grounding and sold as pellets to local firms that made household utensils like buckets or bowls. In 2011, RECICLA processed about 15 tons of plastic waste per month. In 2009, AMOR (Mozambique Recycling Association) started as a not-for-profit organization dedicated to promoting recycling and integrated solid waste management in Maputo by installing collection points and supporting 350 informal workers helping to collect and process the 400 metric tons of material sent to international markets for recycled materials, as the International Institute for Environment and Development published.

All plastic pellets are imported

Founded in 1995, Topack is Mozambique's only commercial plastic recycler, operating in four areas injection moulding, blow moulding, film extrusion, and PET for producing household utensils like baskets, bottles, boxes, tables and chairs. Another purchaser of plastic is Yopipila, using empty recycled bottles filled with sand to substitute cement blocks. According to the World Bank, the local PET Recycling Company PETCO "has contracted with external recyclers to buy post-consumer PET bottles and incentivize local collectors to recover packaging". But instead of setting on the potential of these enterprises, the World Bank is convinced that "Mozambique is not a plastic producer, all plastic pellets are imported". On the contrary: The Alliance for Malaria Prevention gave an account in 2020, that 70 percent of

Photo: Petra Hoeß, FABION Markt + Medien / abfallbild.de

discarded plastics are objects composed of a mixture of PE, PET and others "for which recycling technology is non-existent in the country". According to the UNEP/IUCN National Guidance for Plastic Pollution Hotspotting and Shaping Action National Report for Mozambique published in 2020, PET and LDPE are the "most critical" polymers, followed by PP and synthetic rubber. Prospectively, the dependence on external raw materials will not change, as the plastic import market of Mozambique is projected to grow steadily from 168 million Dollar in 2023 to 188 million Dollar by 2028. Conversely, the local plastic export market has shown a downward trend since 2005: In a Plastic Industry Outlook, the online magazine ReportLinker even expects a slight decline from about 2,1 million Dollar in 2023 to two million Dollar in 2028.

Chinese factories

The institution of foreign enterprises focussing on treating plastic waste did not help. IPED Plastics, a Chinese-owned factory producing plastic bags in Maputo Province, hit the headlines in 2018 with unhealthy and dangerous conditions for low wages, as the trade union criticized. In 2021, the plastic recycling plant in Zimpeto in Maputo Province was closed by a multi-sectorial team led by the National Institution for Inspection of Economic Activities (INAE). According to the Club of Mozambique, the plant "does not have a DUAT (i.e. Dual-Aggregation Transformer Network), a solid waste management plan, an environmental monitoring plan, nor does it hold updated and regular medical examinations of its workers or collaborators". And in February 2024, an "allegedly illegal Chinese plastic recycling factory" named Shenxian Plastic Recycling Limitada running since 2022 reportedly affected its Infulene neighborhood by toxic smoke, contaminated water and a dump right outside the factory.

100,000 tons of plastic discarded

The Mozambican government is conscious of what the World Bank calls "negligible material recovery rates" as well as of the fact, that "all collected plastic waste is improperly disposed of in open dumpsites and only a small amount is recycled", as the Club of Mozambique quoted Ivete Maibaze, the Minister of Land and Environment. She admitted that "100,000 tons of plastic waste are annually discarded into the environment, jeopardizing the country's rivers and oceans". Moreover, she was aware of plastics affecting the fisheries directly through damages to ships, plastic in fishnets and abandoned fishing gear.

But aside from introducing the digital waste app, the government in Mozambique did little to force plastic waste recycling and reduce its leakage. All that is known: In July 2015, a new decree to limit the use of plastic bags was envisaged. The order seems not to have been very effective, as in June 2022, the Mozambican authorities adopted another law to ban the use of plastic bags starting by 2024.

The private sector – the most important driver

The Sustainability Middle East & Africa Magazin quoted Ivete Maibaze: "The proposal for a regulation on the banning of plastic is already being heard and the country will align itself with the international and national commitments that the government has made through her ministry." The local government relies on several regional and international strategic alliances as well as sources for support and potential funding. This is what the World Bank recommends: "A deep coordination across various national and local government entities and their respective mandates". And not to forget that "the most important driver of a continued transition remains in the hands of the private sector". One can be excited of the Mozambican envisaged "upcoming National Action Plan to Combat Marine Litter".

RECYCLICO BATTERY MATERIALS RECEIVED EUROPEAN UNITARY PATENT

Canada-based company RecycLiCo Battery Materials Inc. has announced the registration of the European Unitary Patent (Patent Application No. 17870326.0) for its hydrometallurgical recycling solution. This patent grant would solidify the company's intellectual property portfolio in Europe, "a key market focused on electrification and sustainable battery technologies". According to RecycLiCo, this patent is the 16th issued globally. The company holds patents, inter alia, in the United States, South Korea, Japan, China, India, Australia, and Canada. "The recognition of RecycLiCo's cutting-edge technology underscores the company's leadership in the sustainable battery recycling sector, aligning with Europe's ambitious environmental goals," the enterprise underlined in a press release. The company is specializing in sustainable lithium-ion battery recycling and materials production. As reported, with minimal processing steps and up to 99 percent extraction of lithium, cobalt, nickel, and manganese, the patented, closed-loop process turns lithium-ion battery waste into battery-grade cathode precursor, lithium hydroxide, and lithium carbonate for direct integration into the re-manufacturing of new lithium-ion batteries.

recyclico.com/technology/

PEKUTHERM INTENDS TO DOUBLE RECYCLING VOLUME

German plastics recycling company Pekutherm Kunststoffe GmbH plans to double its recycling volume and wants to expand in Europe.

According to the specialist in recycling thermoplastics such as acrylic glass (polymethylmethacrylate, PMMA) and polycarbonate (PC), Heiko Pfister, Managing Partner of Pekutherm, has identified Italy, Spain, France, and the Baltic States as key target markets for expansion. Additionally, the press release said the company plans to broaden its operations in Northern Europe, building on its existing presence in Denmark and Finland.

Pekutherm's expansion would be driven by environmental and climate concerns rather than purely economic considerations, Heiko Pfister was quoted. According to his research, Europe would generate approximately 30,000 tons of PMMA waste annually. Of this amount, 5,000 tons are recycled at the company's area in Geisenheim (near Frankfurt am Main) for reuse, while the rest is processed elsewhere, often ending in incineration. "A significant portion is collected in Europe and shipped to Asia, where the recycling rate is likely very low," he said. His plan for Pekutherm is to double the PMMA recycling volume to 10,000 tons within the next three years. This effort would also include an additional 1,000 tons of polycarbonate (PC) and 1,000 tons of other plastics already being recycled in Geisenheim. "For every 100 tons of recycled material used, nearly 500 tons of carbon dioxide can be saved," Pfister was cited. He further emphasized that the recycled materials meet new raw material standards in terms of purity and quality, underscoring the environmental benefits of reusing these resources.

Photo: pekutherm GmbH

pekutherm.de

European-American Collaboration:

TURNING CARBON EMISSIONS INTO PLASTICS

eNaphtha from Infinium to serve as feedstock alternative.

US-based eFuels company Infinium and Borealis, an European supplier of plastic solutions, have agreed to enable the production of low-carbon-footprint plastics generated from waste carbon dioxide (CO_2) emissions that would otherwise be released into the atmosphere, both companies announced in a joint press release. These plastics, known as polyolefins, were commonly used in manufacturing consumer goods such as packaging, appliances, apparel and medical devices.

"As the world's first supplier of commercial volumes of eNaphtha, a sustainable drop-in alternative to traditional fossil-based naphtha, Infinium is helping to decarbonize plastics production and reduce harmful CO_2 emissions globally", the information said. "Infinium eNaphtha is manufactured at the company's facility in Corpus Christi, Texas, USA, and commercial eNaphtha volumes are being shipped to Borealis' Porvoo facility in Finland, which provides advanced and sustainable polyolefin solutions to its manufacturing customers. The world's first commercial eNaphtha shipment left the United States in May."

Photo: Röni Kuva Oy/Borealis

Aerial view of the Borealis production location in Porvoo, Finland

As emphasized, plastics made from Infinium eNaphtha can be produced using the same facilities and manufacturing equipment and recycled in the same way as with a conventional naphtha-based product. "eNaphtha produced at the Infinium Pathfinder facility has received ISCC PLUS certification from the International Sustainability and Carbon Certification (ISCC) body." This certification system would ensure the traceability of the sustainably produced feedstock from its origin throughout the entire chain of custody. According to both companies, the partnership and supply chain development between Infinium and Borealis "is an example of how innovators can collaborate toward novel solutions to meet growing consumer demand for circularity and defossilization."

infiniumco.com
borealisgroup.com

Saudi Arabia:

SIRC EXPORTED RECYCLED PET FLAKES TO UK AND SPAIN

In August this year, the Saudi Investment Recycling Company (SIRC) exported its first recycled and heat-washed PET flakes through its joint venture project under municipal solid waste recycling companies "Yadoum" and "Masab" (a plastic recycling company) to one of the largest manufacturers of recycled PET bottles in the United Kingdom. SIRC, owned by the Saudi Public Investment Fund, considers this achievement an important step for "Yadoum" to enter the British market. Earlier this year, the company had started exporting to some manufacturers in Spain, raising exports to over 1,650 tons. According to the information, this would enable SIRC to expand its export capabilities and strengthen its partnerships with major European companies.

This cooperation would be expected to drive further integration in the PET recycling sector and other related fields. "We take pride in contributing to the Kingdom of Saudi Arabia's sustainability objectives through this initiative", SIRC Group CEO, Engineer Ziyad bin Mohammed Al-Shiha, was cited.

"By reducing greenhouse gas emissions, diverting waste away from landfills, and supporting the Saudi Green Initiative, SIRC plays a key role in empowering local industries and promoting a more sustainable future."

sirc.sa

ITALY: ON TRACK TO REACH THE 2025 TARGETS

With 175 million tons produced, Italy shows the fourth highest amount of waste. On the other side, the country has one of the highest recycling rates in the EU. In 2021, the country recycled at least 51.3 percent of its municipal waste. According to the latest report of the Fondazione per lo Sviluppo Sostenibile (Sustainable Development Foundation), the country even recycled 72 percent of all waste collected – compared to the European average of around 58 percent.

The waste production rates differ between the regions: In quantitative terms, northern Italy produced almost 14.2 million tons, central Italy over 6.3 million tons, and southern Italy over 9.1 million tons. The recycling quote varies too: The northern regions present a share of 71.8 percent with a peak in Venetia of 87.2 percent. The middle offers a rate of 61.5 percent, while the southern is listed with 57.7 percent, including Sicilia with 51.5 percent.

Landfill share decreased

Although Italy has generated about 30 million tons of municipal waste annually since 2015 and kept a stable amount of waste sent to incineration, its landfill share decreased from 26.5 to 20.9 percent between 2015 and 2019. At the same time, Italy reduced the total tonnage of landfilled waste from 7.8 to 6.3 million tons – the landfilling rate of municipal waste in 2020 was still twice as high as the target for 2035. Simultaneously, the material recycling rate and composting/digestion increased from 44 to 51 percent. The 2022 report of ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale) presents data proving that in 2021 two-thirds of the municipalities achieved a separate collection rate higher than 65 percent. But this does not apply to all Italian regions.

High capture rates certified

According to the ISPRA-Report, the separate collection waste in 2021 consisted of 7.3 million tons (mt) of biowaste, 3.6 mt of paper and cardboard, 2.2 mt of glass and 1.6 mt

Photo: meineresterampe / pixabay.com

of plastics. Among the other recyclable materials, there is wood (1 mt), bulky waste (0.9 mt), C&D waste (0.3 mt), metals (0.3 mt), WEE (0.3 mt) and textiles (0.1 mt). The official EU paper on "Early warning assessment related to the 2025 targets for municipal waste and packaging waste" from June 2022 certifies high capture rates for the different municipal waste fractions in Italy. They express the relation between the different waste materials and their separately collected amounts. In 2019, they ranged from 22 percent for textiles and 44 percent for plastics to 56 percent for metals, 59 percent for paper and cardboard as well as 68 for bio-waste. The capture rates of wood totaled 86 percent and 88 percent of glass.

Target of 2035 already reached

Meanwhile, the treatment of paper, cardboard, and paper packaging has reached a quota of 85 percent recycling, a target expected by 2035. In 2021, Italy even went beyond the target with a recycling rate of 87.3 percent; the European average lies at 73.9 percent. Surpassing the targets of 2025 (50 percent) and 2030 (60 percent), the recycling of aluminum packaging in 2022 has already achieved 73.6 percent. The separation machinery producer Ecostar estimates that more than 80 percent of glass packaging and over 85 percent of paper and cardboard packaging were recycled in 2023.

In 2021, there were 657 active urban waste management plants, with the majority (293) dedicated to composting, while 37 and 14 facilities were installed for incineration or co-incineration, respectively. Concerning the recovery or recycling of 765,000 tons of organic waste per year, Italian facilities can produce more than 25,000 cubic meters of biomethane per hour. According to Ecostar, the Italian plastic material recycling market is "rather dynamic": It involves over 350 companies, including waste collectors and sorters, and industrial waste handlers (urban waste collection companies are excluded). Additionally, there are 200 producers of secondary raw materials.

37 incineration plants for urban waste

The volume of municipal waste collected and sent to landfill in Italy totaled 5.2 million metric tons in 2022. The number of landfill sites for municipal waste has been reduced from 126 to 117. At the same time, the number of waste incineration plants for urban waste came to 37. The problem is that 26 of them are located in the north. Conversely, this means that most of the municipal waste in the south is landfilled and only partially recycled or energetically reused. The 2020 edition of the Urban Waste Report of ISPRA shows that the north produced 14.4 million tons of MSW, of which 11 percent went to landfill. The center achieved 6.5 million tons of which 29 percent were disposed of on the ground, while in the south 9.1 million tons of waste were produced and 31 percent discarded in landfills. So, a larger part of the 4.5 million MWh of electrical energy and 2.1 million MWh of heat came from the north.

According to the 2022 "Report on Waste from Economic Activities," the total volume of industrial waste managed in Italy in 2020 amounts to nearly 147 million tons. Of this total, 137.1 million tons, or 93 percent constitute non-hazardous waste, while 9.8 million tons i.e. six percent were qualified as hazardous waste. According to operational services offering company Sfridoo, the non-hazardous industrial waste in Italy was primarily produced by construction (45.1 percent), by waste treatment and remediation activities (26.3 percent), by manufacturing activities (18.2 percent) and several treatments in the single-digit range. The waste amounts are mostly treated by material recovery (70.6 percent), landfill (6.2 percent) or other disposal operations (10.3 percent), co-incineration (1.1 percent) and other incineration activities.

Well organized by consortia

As the German trade and investment company gtai underlines, the recyclable packaging material both from households and companies is well organized by the consortia Ricrea (steel), Cial (aluminum), Comieco (paper), Rilegno (wood), Corepla (plastic), Biorepack (bio-plastic) and Coreve (glass); the separation of textiles is envisaged for 2025. This system is said to be exemplary and successful in means of recovery. The National Aluminum Packaging Consortium (Cial), collaborating with Italian municipalities, now has 243 affiliated companies, 430 contracted operators and 246 platforms nationwide. Eco-Star balances: "According to a survey of 534 companies, in 2021, the sector's turnover reached around 13.5 billion Euro, employing over 97,000 workers." Several plans exist for constructing multi-million-dollar facilities to convert local or foreign waste to biomethanol and hydrogen.

"Investments in the waste sector in Italy are running, as had never happened before".

The Waste Management Services in Italy's industry is valued at 1.8 Billion Euro and ranked first in Europe in 2024 (of 23 total EU countries) as well as the industry's rank as first has remained the same since 2019. Of course, Italy's Environment and Energy Security Minister Gilbert Pichettoon is proud of his country. Meanwhile, there are "192 projects for flagship investments in the circular economy" and a system "that never stops investing in sustainability, obtaining flattering results", he told the news agency Reuters at the World Recycling Day in March 2023. A paper from the EU Commission regarding the Italian "state of play" declares: "In view of recent increases in recycling rates and implemented actions and investments, additional progress is expected."

Investments are running

There is financial support. According to the online newspaper L'Eco di Bergamo, in 2021 "investments in the waste sector in Italy are running, as had never happened before". The total amount of investments reached 912 million Euro and the 124 top players recorded an aggregate production value of 10.26 billion Euro. Another financial source is the Recovery and Resilience Facility (RRF), part of the EU Commission's REPowerEU Plan, which includes a reform and investment plan for Italy to "become more sustainable, resilient and better prepared for the challenges and opportunities offered by the green and digital transitions". As Italy's major challenges require the "improvement in the management of waste and water resources", the transition is supported by 27.7 billion Euro for the "development of renewable energies and the circular economy and improvement in waste and water management", aiming amongst others at the increase of the recycling rate. Finally, there might be funds resulting from the National Recovery and Resilience Plan (PPNR) offering opportunities to create a more competitive system based on sustainable development and digital innovation.

CONSTRUCTION & DEMOLITION WASTE MARKET WITH GROWTH OPPORTUNITIES

As reported by Polaris Market Research, the global construction and demolition waste market is expected to reach a value of over 265.68 billion US-Dollar by 2032 from an estimated 126.79 billion US-Dollar in 2022.

The global demand for construction and demolition waste management is anticipated to be propelled by growing administrative schemes globally, the company informed. In the EU, this kind of waste comprises of notable allocation of aggregate debris generated yearly, considering for roughly 0.85 billion tons or 25 to 30 percent. This volume includes asbestos, gypsum, concrete, plastic, wood, bricks, glass, and metals, most of which can be recycled or repurposed. However, due to adverse environmental impacts, a significant amount of construction and demolition waste must be disposed of with proper processing. Policies and Regulatory norms have been implemented to address this issue to enforce the reuse and recycling of over half of the waste produced. "These guidelines and landfill legislation play a crucial role in promoting smart management practices for construction and demolition waste. They encourage the development and continuity of service providers that offer efficient services, products, and solutions for managing construction and demolition waste." Consequently, these factors were expected to accelerate the growth of the market shortly, Polaris Market Research emphasized.

polarismarketresearch.com/industry-analysis/construction-demolition-waste-market

Photo: O. Kürth

GLOBAL ROBOTIC WASTE SORTING MARKET AND ITS DRIVERS

The rise in the need for efficiency and accuracy in waste sorting, coupled with the increased application of robotic arms in waste management facilities, is boosting the value of the global robotic waste sorting market, Transparency Market Research Inc. stated. In 2023, the market stood at 2.3 billion US-Dollar, the market research company informed. According to the prognosis, the global market is projected to reach 3.4 billion US-Dollar in 2034 at a CAGR (compound annual growth rate) of 3.8 percent between 2024 and 2034. As reported, one of the primary factors driving the market is the need for enhanced efficiency in waste sorting. Transparency Market Research: "Traditional manual sorting methods are labor-intensive and often prone to errors, leading to inefficiencies and increased operational costs. Robotic systems, equipped with advanced technologies, offer a more efficient alternative by automating the sorting process. This not only speeds up operations but also reduces the reliance on human labor, minimizing the risk of injury and ensuring consistent performance." Autonomous waste sorting systems are at the forefront of this market. These systems employ computer vision and deep machine learning algorithms to detect and classify different types of waste materials.

"Computer vision systems capture images of waste items, while deep learning models analyze these images to identify and sort materials with high precision," the information said. "This technology not only enhances sorting accuracy but also adapts to evolving waste streams and varying material types."

transparencymarketresearch.com

ELECTRIC VEHICLE BATTERY MARKET SURGES TO MORE THAN 500 BILLION DOLLARS BY 2031

The Global Electric Vehicle (EV) Battery Market is driven by increasing demand for EVs due to environmental concerns, supportive government policies, and advancements in battery technology, leading to longer ranges and faster charging times.

The worldwide market is projected to grow at a CAGR (compound annual growth rate) of 25.1 percent from 2024 (value 63.51 billion US-Dollar) to 2031 and is expected to reach 573.08 billion US-Dollar, according to a new report published by the US company Verified Market Research. Asia-Pacific, especially China, has a dominant position in this market. That is mainly due to its strong manufacturing capabilities, wide supply chain, and favorable government regulations.

"This dominance expedites market expansion by stimulating innovation and achieving economies of scale. However, it also generates regional interdependencies and exposes supply chain vulnerabilities for other markets, notably Europe and North America, which might affect global market stability and growth dynamics." Major players would play a pivotal role in shaping the future of the Electric Vehicle Battery Market. Financial statements, product benchmarking, and SWOT analysis provide valuable insights into the industry's key players.

Based on the research, Verified Market Research has segmented the global market into battery type, application, end-user, and geography.

verifiedmarketresearch.com/download-sample/?rid=16299

Photo: O. Kürth

HOLYGRAIL 2.0 COLLABORATES WITH FILIGRADE SUSTAINABLE WATERMARKS

The HolyGrail 2.0 Initiative has announced its engagement in a new project aimed at testing the capability of the CurvCode watermarking technology to close the loop on HDPE milk bottles in the Netherlands.

The packaging industry is abuzz with the application of mandatory EU-wide rules for packaging and packaging waste approaches, the digital watermarks initiative wrote in a press release. “Among others is the specific obligation to include a certain percentage of recycled content in plastic packaging, which all the more requires a transformational change in the industry, moving away from a linear model to embrace full circularity.” Digitalization through pioneering technologies would offer a unique opportunity to drive this revolution in the waste industry. “Championing the crucial role of cross-value chain collaboration, packaging converter ALPLA, dairy product manufacturer Farm Dairy, technology provider FiliGrade Sustainable Watermarks, machine supplier Pellenc ST, and HolyGrail 2.0 have joined forces in an initiative that aims to enable the circular deployment of HDPE beverage containers in the Netherlands.”

Photo: O. Kürth

The first project phase would run sorting trials in a semi-industrial setting on HDPE milk containers that carry the CurvCode – separating them from standard packaging waste to create a pure stream. Produced by ALPLA, the samples will be marked with the CurvCode watermark, then contaminated with milk and labeled to mimic post-consumer use, before being shipped to Pellenc ST’s headquarters for testing. “Under the supervision of the HG2.0 technical team, the trials will be conducted via the FiliGrade/Pellenc ST prototype sorting module over the summer on around 4,000 items. Successful completion of the sorting trial at semi-industrial level will bring the CurvCode technology to TRL 7. The result report will be produced by HG2.0 Technical Management Team and disseminated with relevant stakeholders from the HDPE milk-container supply chain in the Netherlands, paving the way for the next phases.”

The Digital Watermarks Initiative HolyGrail 2.0 – driven by AIM – European Brands Association and powered by the Alliance to End Plastic Waste – is a pilot project to prove the technical viability of digital watermarks for accurate sorting of packaging waste, as well as the economic viability of the business case at large-scale. Digital watermarks are imperceptible codes, the size of a postage stamp, covering the surface of a consumer goods packaging and carrying a wide range of attributes. The aim is that once the packaging has entered into a waste sorting facility, the digital watermark can be detected and decoded by a high-resolution camera on the sorting line, which then – based on the transferred attributes (e.g. food vs. non-food) – can sort the packaging in corresponding streams. This would result in better and more accurate sorting streams, thus consequently in higher quality recyclates benefiting the complete packaging value chain.

digitalwatermarks.eu

GOAL: DIRECT RECYCLING OF SPENT BATTERIES

Researchers of the German Karlsruhe Institute of Technology (KIT) and seven industry partners have launched a collaboration to develop a more efficient recycling process for spent batteries, by means of which the active components are recovered while maintaining their functionality.

According to KIT, electrification of the mobility sector is needed for Germany to reach its climate protection goals and a megatrend in the country's automotive industry. "The associated high need for lithium-ion batteries requires sustainable and closed material cycles, from battery materials throughout the battery lifecycle to recycling as well as a closed cycle of battery cell manufacture," Dr. Marco Gleiß from the Institute for Mechanical Process Engineering and Mechanics was quoted. He is KIT's coordinator of the project "Agile Process Chain for Direct Recycling of Lithium-Ion Batteries and Regeneration of Active Materials" (DiRecReg), which is funded with nearly three million Euro by the Federal Research Ministry of Germany.

Recovering Rather Than Crushing or Decomposing

Using current methods, battery cells are crushed, and active materials are dissolved down to the molecular level for later extraction from the liquid in the form of metal salts, KIT described the general practice. In this way, up to 90 percent of critical elements, such as cobalt, nickel, and manganese, can be recovered. "However, consumption of energy and chemicals is very high. And even more energy and raw materials are required for the production of new battery material from the materials extracted."

On the contrary, new, highly promising approaches were based on directly recycling active materials from spent batteries or production waste. As underlined, the active materials are no longer dissolved completely. Instead, they are decomposed into their constituents and separated mechanically so that highly pure fractions can be recovered.

Such a direct recycling process is not yet used in industry, as the behavior of the recycled material cannot be predicted, KIT wrote. Criteria and rules to assess the usability of the aged material were still lacking and so are economically efficient solutions to decompose different battery packs into their constituents with a reasonable expenditure. "These aspects are addressed by our project. It primarily covers the development of an agile process chain for the direct recycling of lithium-ion batteries and regeneration of the recovered active materials," Dr. Thomas Dreyer from Weber Ultrasonics AG, project coordinator for DiRecReg, gave account. According to him, it is important that the process can be adjusted to various starting materials of battery production as well as to production waste and can be used to recycle various battery types and designs. "We also want to replace the energy-consuming steps of today's recycling processes, the objective being to obtain sustainable recyclates of a high quality."

The project consortium

The DiRecReg project is scheduled for a duration of three years. The project consortium under the direction of Weber Ultrasonics AG consists of ten partners and one associated partner. Among them are four institutes of KIT: wbk Institute of Production Science, the Institute for Mechanical Process Engineering and Mechanics, the Institute of Applied Geosciences with the Chair for Geochemistry and Economics Geology, and the Thin-Film Technology Working Group. The six industry partners are Battery cell manufacturer PowerCo SE, the materials technology

Within the DiRecReg project, four institutes of KIT and seven companies develop a complete process chain for a better recycling of spent batteries and production waste

Photo: wbk, KIT

and recycling group Umicore AG & Co. KG, the manufacturer of gripping and handling systems SCHUNK SE & Co. KG, plant integrator FIBRO LÄPPLE TECHNOLOGY GMBH, and plant manufacturers Carl Padberg Zentrifugenbau GmbH and Weber Ultrasonics AG. Siemens supports the project in the area of control and digitalization systems as an associated partner.

mvm.kit.edu/english/index.php

A SLAG CALLED SIGS CAN BE TURNED INTO A BUILDING MATERIAL

According to SINTEF – "Norwegian Stiftelsen for industriell og teknisk forskning" – greenhouse gas emissions from concrete production can be reduced, if a part of the cement is replaced by SiGS (Silica Green Stone), a slag waste resulting from the manufacture of silciomanganese, which is a key component in steel production.

"In our tests, we've replaced up to 40 percent of the cement normally used in concrete", SINTEF cited Per Anders Eidem, a researcher working on the project VALSiGS at the Norwegian science institute. By using finely powdered slag as a binder additive, significant reductions in the climate footprint of concrete have been achieved. As reported, the method has resulted in up to a 95 percent reduction of greenhouse gas emissions compared to the usage of traditional cement. Regarding global greenhouse gas emissions, eight percent are derived from concrete manufacture.

The SiGS slag is a by-product, traditionally used as an industrial fill, Per Anders Eidem underlined. "Adding such by-products to concrete is just one of a number of initiatives that the cement manufacturers are trying out in order to address their climate footprint. Another has been the use of flue ash derived from coal-fired power stations, but access to this material is now becoming more restricted, and it's unlikely that much more will become available." Slag from iron smelting is another by-product used in cement. "The SiGS slag that we're studying now has some similar properties to that which we derive from the production of iron in blast furnaces", he explained.

Cooperation and good results

In order to conduct tests on the SiGS slag, SINTEF and the multinational mining and metallurgy company Eramet have joined forces with concrete paving specialists Aaltvedt Betong and prefabricated slab manufacturers Block Berge Bygg.

"We ground down the slag in order to find out how it would behave as a cement substitute. Eramet cooled down the SiGS and ground it down to the same particle size as the cement.

This is the powdered SiGS slag that can act as a substitute for cement in concrete

Photo: SINTEF

Then they made both a dry concrete mixture, similar to that used to cast paving stones, and a wet mixture, such as that used in building constructions", Eidem reported.

Strength measurements were performed after 28 days, the standard period for concrete strength tests. The results showed that the concrete increases in strength as it ages, far beyond the 28-day period. As reported by SINTEF, the researchers' conclusion is that the 'SiGS concrete' is strong enough to be used for the same purposes as concrete containing pure cement without any slag additives. "Its early strength is lower, but after 28 days, this increases so that it becomes just as strong as so-called environmental cement – at least, in the case of the dry concrete mixture", Eidem was cited.

The results were good, even with as much as 40 percent of the cement replaced by SiGS. However, in the next stage of the project, when the SiGS cement will be tested at a larger scale, it is likely that a smaller proportion of the SiGS slag will be incorporated into the mixtures than in the initial experiments.

SiGS and binding agents from other suppliers are now going to be tested as part of some pilot projects.

sintef.no/en/

Power and Efficiency:

FOR REC'S ADVANCED SOLUTIONS FOR E-WASTE RECYCLING

The rise in electronic consumption has brought with it a significant increase in Waste Electrical and Electronic Equipment (WEEE). This waste stream is particularly complex, requiring specialized treatment to safely manage hazardous materials such as mercury, lead, and cadmium. Moreover, recycling WEEE not only ensures the safe disposal of harmful substances but also allows for the recovery of valuable resources. That reduces the demand for new raw materials, curbs greenhouse gas emissions, and promotes more sustainable waste management practices.

FOR REC: A Pioneer in High-Performance Recycling Solutions

At the forefront of this critical industry is FOR REC, a company renowned for its innovative recycling technologies. They design and build high-performance machines specifically tailored for recycling WEEE, household appliances, refrigeration units, and photovoltaic (solar) panels. Their solutions are engineered with a focus on maximizing efficiency while minimizing environmental impact, underlining FOR REC's deep commitment to sustainability. One of the standout features of FOR REC's approach is the modularity and customization of their recycling plants. Each system is meticulously crafted to meet the specific needs of customers, reflecting the company's dedication to delivering highly adaptable and efficient solutions.

Advanced Recycling Technologies

FOR REC machines are known for their low power consumption, which not only reduces operational costs but also lessens their environmental footprint. These advanced systems can process a wide range of e-waste, from large household appliances to the intricate components found in solar panels. The comprehensive, multi-staged recycling process employed by FOR REC ensures the effective separation of valuable materials, which can then be reused in new products.

FOR REC has developed specialized recycling lines for:

- Household appliances and electronic equipment such as TVs and displays
- Refrigeration and air conditioning appliances
- Photovoltaic panels

Solar Panel Recycling: A Cutting-Edge Solution

As the world increasingly turns to renewable energy, the recycling of solar panels is becoming an essential aspect of sustainable waste management. In response to this growing need, FOR REC has developed specialized recycling lines for photovoltaic panels. The process begins with the shredding of the panels, followed by the separation of different materials and the removal of contaminants. Notably, FOR REC's solar panel recycling line is capable of processing up to four tons of material per hour, with the potential to upgrade to six tons per hour by incorporating a hydraulic grinder and larger separation systems. These systems are designed to recover various valuable materials, ensuring the efficient recycling of components like aluminum, magnetic metals, glass, wiring (with copper) and EVA (Ethylene Vinil Acetate)

forrec.it

Photo: FOR REC S.P.A.

EFFICIENCY TEST IN RECYCLING OF WASTE WOOD

Two machines from Arjes demonstrated their respective capability in shredding wood.

Photo: Arjes

According to German manufacturer Arjes, the efficiency and performance of two shredding machines for processing waste wood were put to the test at the Biomassehof Chiemgau in Bavaria: the new EuRec S-850 (an Arjes brand) and the well-established ARJES VZ 850. The goal of the comparison test was to evaluate the quality of both machines in shredding pallet wood.

The ARJES VZ 850, powered by a robust 16-liter diesel engine with 565 kW, is already considered a reliable two-shaft shredder in the recycling industry, the manufacturer of recycling machinery underlined. “Opposite it stood the new challenger, EuRec S-850, equipped with an efficient and environmentally friendly 11-liter diesel engine with 315 kW.” At first, there seemed to be hardly any difference in throughput performance, as both machines reached about 50 tons per hour, the company stated. But the EuRec S-850 emerged as the “winner”. With nearly identical throughput performance, the EuRec shredder produced significantly finer output material. “About 30 tons of shredded wood waste could be processed to a final particle size between 0 and 100 mm. In contrast, the VZ 850, with the same configuration and rotation speed of the shredding shafts, only achieved 25 tons in the 0 to 100 mm range.”

The result

As reported by Arjes, this comparison test demonstrated that the EuRec S-850, despite its smaller engine, delivers excellent performance while producing a finer end product. This assurance would make the upcoming market launch of the new machine appear particularly promising. The opportunity to conduct the test was provided by the Schaumaier Recycling Group at their Biomassehof Chiemgau.

The certified waste management company specializes in accepting waste wood of classes A-I to A-IV for thermal and material recycling. Since 2022, the company has been operating at the Chieming site with the VZ 850. In 2024, another twin-shaft shredder from Arjes, the EKOMAXX 800, was acquired and is set to be used at various locations within the group.

- arjes.de
- schaumaier.de
- biomassehof-chiemgau.de

REWAG RELIES ON SENNEBOGEN MACHINES FOR WASTE RECYCLING

In the middle of the municipality of Kaiseraugust near Basel, REWAG Entsorgung AG relies on sustainable recycling technologies. Thousands of tons of waste, from household waste to construction and demolition waste, are recycled there every year. The work is done by several SENNEBOGEN machines – including one of the latest innovations, the SENNEBOGEN 824 G.

The sorting grab places the wooden spades in the designated position

REWAG Entsorgung AG, founded in 1996, is a renowned waste disposal specialist who professionally disposes all types of waste materials from companies and private households. The company operates three sites in Switzerland, including Münchenstein, Sissach and the main site in Kaiseraugust – all within a 30-kilometer radius of Basel. Its services include acceptance, recycling, sorting and processing of waste for onward transportation.

A central credo of REWAG Entsorgung AG is to return all recyclable materials to the material cycle, while residual materials are transported away by rail and incinerated to produce electricity and heat for Basel households. The company attaches great importance to environmentally friendly disposal processes, as most of the waste is sorted manually by specialized employees and material handlers.

REWAG stands by SENNEBOGEN

24 employees work at the main site in Kaiseraugust, including five machine operators. The company recently decided to purchase a new machine, as the previous 821 E had already reached 14,000 operating hours (2,000 per year). The choice fell on the successor model, the 824 G, which has been in use since March 18, 2024. It impresses with a reach of 12 meters and an operating weight of up to 26.3 tons.

Efficient and compact – the 824 G in continuous use at REWAG

"We were very satisfied with the old machine. That's why it was always clear to me that we would choose this brand again," explains Operations Manager Urs Kaiser. The SENNEBOGEN machines are also easy to operate. Every operator drives every machine. Everyone is already familiar with how these material handlers work, so that each operator can quickly work efficiently with each machine.

A total of three material handlers are used for the sorting process, including the 824 G, a mobile 817 E and a stationary 821 E electric excavator in the hall.

More than just efficiency

The decision to use SENNEBOGEN machines was based not only on their performance, but also on their

Photos: SENNEBOGEN Maschinenfabrik GmbH

environmental friendliness and energy efficiency. The machines have an efficient diesel engine with automatic idling and optimized hydraulics, as well as a SENCON control system that allows the operator to precisely control energy consumption. The Stage V exhaust system also contributes to the environmental friendliness of the machine.

The design of the new MaxCab is also impressive. Ergonomic seats and high-quality air conditioning in the spacious MaxCab of the latest generation offer good comfort. Thanks to the full-length windshield, the entire work area can also be seen, which contributes to the safety of all employees.

Pascal Graff: "I'm pretty proud to be operating this new machine."

Service easier than ever before

It is not just the ease of operation and comfort in the cab that benefits the company and its drivers. The combination of user-friendly design and outstanding customer service has made SENNEBOGEN machines the first choice for REWAG Entsorgung AG. Pascal Graff, the operator who has the main responsibility for the 824 G, emphasizes: "I really like the ease of maintenance of this machine. Many things have been optimized in the SENNEBOGEN G-series. The service, the availability of spare parts and the support from Kuhn Schweiz AG and SENNEBOGEN are the icing on the cake."

sennebogen.com

INCREASING THE PERFORMANCE OF INDUSTRIAL SORTING LINES

Austrian company EVK DI Kerschhaggl GmbH, a provider of sensor-based solutions for sorting and monitoring bulk material in recycling and other industries, has introduced EVK Alpha G100 CS, a real-time image-processing device with extended functionality for sorting applications.

According to the company, EVK Alpha G100 CS is a data processing platform capable of supporting multi-sensory data streams. In addition to the material classification of image data provided by hyperspectral camera EVK Helios SWIR, the device would also support the fusion of EVK Helios data with data from color cameras or inductive metal sensors, such as the EVK Abas. "The output data directly steer the ejection systems of an optical sorter system, providing increased flexibility, scalability and reduced time-to-market to manufacturers of optical sorters," the Austrian supplier emphasized.

Photo: EVK DI Kerschhaggl GmbH

As underlined by the company, the EVK Alpha G100 CS processes data at a speed that allows it to pass on the relevant information in real time. "Material classes are determined and classified within a few milliseconds. Complemented by the chemometric software EVK Sqalar for application development, a powerful system for industrial applications is created, such as sorting complex plastic waste streams."

evk.biz

HOW VIDEO MONITORING SOLUTIONS FOR RECYCLING FACILITIES CAN IMPROVE OPERATIONS

There are roughly 18,000 recycling plants across the US, and their distribution mirrors population density: there are more such facilities in areas with more population, as expected. The average American produces 4.9 pounds of waste daily, leading to a whopping 292 million tons of waste per year across the country. Consequently, recycling facilities are critical to the health and well-being of the population, and their importance will only grow in the future. Recycling facilities' operations have to run smoothly to prevent incidents and keep up with the ever-growing demand. That is where video monitoring comes in.

Video monitoring to streamline operations in your recycling facility

The first thing that pops to mind when you say "video monitoring" is security. Any camera system can provide you with security, but in recycling plants, video monitoring can do so much more than that. There are more than 16 types of recyclable materials that waste management plants have to deal with. This means different equipment, different training procedures, and different processes for each of these materials.

It is very easy for things to fall through the cracks when you have to manage so many different systems and procedures. Moreover, recycling plants are typically huge facilities – thousands of square feet that need to be monitored. This makes it almost impossible to use human monitoring.

With video monitoring, all you need is a remote or on-site operator, who can:

- Monitor the live feed
- Keep an eye on every piece of machinery to spot, for instance, when a conveyor belt is worn down. This can help avoid both incidents and costly downtime.
- Spot inefficiencies in your processes, for example, the route between where the waste storage area and the waste processing area is too long and can be shortened, thus improving your overall productivity.
- Spot when a piece of equipment works less effectively than normal. It may be time to schedule preemptive maintenance to improve productivity.
- Spot fires (one of the biggest risks in recycling facilities) with the use of thermal cameras before they turn into disasters.

Video monitoring to enhance compliance in recycling facilities

Recycling facilities have to adhere to countless rules and laws, both at state and federal level. As environmental laws become stricter all over the world, so will the rules that waste management plants have to abide by. Breaking environmental laws comes with hefty fines and even facility closure. Video monitoring can help you prove that your recycling facility is compliant. You can simply show the video records to the inspector and make your case.

Video monitoring enhances safety in recycling plants

Recycling facilities are harsh working environments. Heavy machinery can cause accidents, while some of the recyclable materials can be toxic to the workers if they are not handled properly. Through video monitoring, you can examine and review the processes and the way your workers interact with the equipment and the waste. Small glitches and human errors are hard to spot by a human supervisor who is smack in the middle of the action. The bird's-eye-view of a remote operator, on the other hand, is entirely different because it comes with the much-needed holistic perspective. You can use the video feed in your training sessions or as a starting point to improving your operations and your processes to enhance the safety of your staff.

Moreover, the right video monitoring solution will help you tackle both security and safety at the same time. Security breaches can quickly turn into a safety issue if the intruder mishandles

Photos: Opticom

the equipment or the toxic waste. Once again, a remote operator can easily notice an intruder and alert the police and the on-site personnel, thus preventing both theft and, perhaps, a dangerous accident.

How do you choose the best cameras for your recycling facility?

The camera system you need depends a lot on the specifics of your recycling facility.

- Is it a high-humidity environment?
- A high-vibration environment?
- Are there significant temperature variations?
- Do you work with flammable materials?

The answers to these questions will dictate whether you need explosion-rated cameras or not, if you need vibration mounts, and many other details.

The only certain thing is that store-bought or commercial cameras will rarely cut it in a recycling facility, especially in its most sensitive areas. While they require a smaller initial investment, these cameras will have a very short lifespan in an industrial setting.

Opticom Technologies recommends working with a video monitoring partner to design and implement your video monitoring system to make sure it meets your facility's unique needs.

opticomtech.com

■ Author: Heidi Schmidt
Global Sales Manager
Opticom Technologies

About the Author

Heidi Schmidt

Heidi has worked in the video technology space for almost 20 years, building expertise in CCTV, industrial video applications, new product development, video network solutions, and more. As a sales leader at Opticom Technologies, she helps customers implement robust video monitoring solutions for unique and harsh industrial environments.

WASTE ROBOTICS AND GREYPARROT ANNOUNCED PARTNERSHIP

Canada-based company Waste Robotics, a leader in advanced waste recycling solutions, announced its partnership with Greyparrot, a company focusing on AI waste analytics and headquartered in the UK.

"Leveraging Greyparrot's advanced analytics, Waste Robotics aims to transform the landscape of automated sorting solutions, delivering tailored robotic systems to meet the unique needs of each client", the company's press release said. At the outset of the partnership, Waste Robotics would utilize Greyparrot Analyzer, an AI camera system deployed at global sorting facilities, to characterize waste streams and understand the opportunities for automated robotic sorting. "In this approach, known as the Robot Validator, Waste Robotics conducts a deep analysis of the performance and cost evaluation of different robotic systems to identify the best-suited solution. The aim is to model the future implementation of Waste Robotic's sorting solutions to ensure operational efficiency for clients across diverse waste management sectors."

wasterobotic.com
greyparrot.ai

FORNNAX TECHNOLOGY EXPANDS IN EASTERN EUROPE

Fornnax Technology is steadily expanding its global footprint, having recently completed recycling machinery installations in Eastern Europe. The Ahmedabad-based recycling machinery producer has delivered a range of primary shredders to three Eastern European countries: Serbia, Poland, and Bulgaria. The Indian company has been working to enter these markets for some time.

Emphasizing the importance of this market entry, Jignesh Kundaria, Managing Director of Fornnax Technology Pvt Ltd, mentioned during an interaction at the TRRAI Conclave 2024, “Eastern European companies have primarily relied on European recycling lines, but now, in a major breakthrough for us, the installation of our machinery in these markets indicates that our recycling lines are beginning to gain traction in these high-end markets.” Fornnax Technology participated and exhibited at the recently concluded day-long conclave on August 24th in Jaipur, Rajasthan, organized by Tyre & Rubber Recyclers Association of India (TRRAI).

Fornnax Technology provided Steel Impex Serbia with a primary shredder SR-150, featuring a trommel screen for tire-derived fuel (TDF). The line became operational in July 2024.

The Dual-Shaft SR-150 Shredder is specifically designed for recycling passenger and truck tire waste, with output sizes ranging from 50 mm to 60 mm. Tire shred is recognized as an effective alternative fuel for cement kilns. Utilizing TDF in cement kilns reduces nitrogen oxide (NOx) emissions and lowers costs, as less urea is needed. Additionally, particulate matter emissions are reduced.

The Indian machinery producer dispatched a custom-designed primary shredder SR-200 to a Bulgarian recycler at the end of July 2024. The shredder performs the primary shredding of mining tires, producing strips with sizes ranging from 60 mm to 80 mm. The downsized shreds are then sent to the next line for further processing. “Installing the line at the Bulgarian site is a major breakthrough for us, as the company had been using European equipment before ordering the SR-200 primary shredder from Fornnax.” The line is scheduled to be operational by September. In another breakthrough in Eastern Europe, Fornnax Technology dispatched its flagship high-capacity primary shredder, the SR200-HD, to a Polish recycling site. The shredder is being used to recycle passenger, truck, and agricultural tires, with a single-pass capacity of 25 tons per hour and a second-pass capacity of 14 tons per hour.

The SR-200 HD has been dispatched and is anticipated to be installed and fully operational by the end of September.

Fornnax is a leader in shredding and recycling equipment, offering Primary shredders, Secondary shredders, and Granulators for tyres, municipal solid waste, cable, e-waste, metals, and other industrial applications. Quick after-sales services that enhance their customers’ productivity and uptime. The company is dedicated to shaping the environment for sustainable recycling solutions in the future. The team believes that they are not just selling equipment; they are also building businesses. That is what the company believes and that is who they are. Fornnax Equipment is built with the idea that the simple, biggest, and heaviest is better. The equipment is a combination of advanced products designed to meet the challenges of the recycling world.

Contact Person: Mr. Ankit Kalola + 91-9033077711 / Mr. Nitin Jain + 91-90330 77796, Email: info@fornnax.com, fornnax.com

Jignesh Kundaria, Managing Director, Fornnax Technology Pvt Ltd

Photos: Fornnax Technology Pvt. Ltd.

METALARM METAL DETECTOR FOR AGGREGATES MARKET

At Hillhead 2024, held at the UK's largest quarrying, construction and recycling exhibition, USA-based company Eriez has launched its new MetAlarm metal detector tailored for the aggregates sector.

Photo: Eriez

According to Eriez, one of the global leaders in separation technologies, this "latest innovation marks a significant technological advancement in signal processing". Engineered with a focus on ruggedness, reliability, and ease of use, the MetAlarm had been developed based on direct customer input to meet the industry's most rigorous demands.

As underlined, the new apparatus is specifically designed for installation in fixed-site quarries and mobile crushing plants. "Its advanced detection algorithms are optimized to reliably detect damaging iron and manganese steel, providing superior protection for crushers, screens, and conveyor belts", the provider assures. The MetAlarm was developed in collaboration with Cardiff University.

MetAlarm prototype testing has garnered exceptionally positive feedback Eriez gave account. "Heidelberg Materials reported a significant reduction in equipment downtime due to blockages at its quarry near Pontypridd, Wales. This improvement has boosted production and throughput, leading to substantial cost and time savings."

eriez.com/NA/EN/Metal-Detection/Metalarm-Metal-Detectors.htm

WASTE EXPO AUSTRALIA

October 23 – 24, 2024, Melbourne (Australia)

Waste Expo Australia, co-located with All-Energy Australia, is an event dedicated to advancing best practices in waste management, renewable energy, and sustainability. This free event attracts a large assembly of waste management and resource recovery professionals in the country, offering a platform for industry experts to explore innovative material usage, improve recovery processes, and reduce landfill waste.

Attendees can engage with cutting-edge technologies, network with leading professionals, and participate in informative sessions, the organizers announce. By bringing together key stakeholders, Waste Expo Australia facilitates the exchange of ideas and solutions and drives meaningful progress in environmental stewardship and community well-being.

wasteexpoaustralia.com.au

ECO EXPO ASIA 2024

October 30 – November 2, 2024, Hong Kong (China)

Eco Expo Asia is a global trade platform for the environmental protection industry, featuring the latest green products, equipment, and cutting-edge technology. With support from Hong Kong, Mainland China, and international government authorities and industry associations, the fair offers B2G, B2B, and B2C opportunities for the green sector. It draws start-ups focused on innovative solutions to environmental challenges, showcases new energy vehicles and charging equipment, and highlights a broad spectrum of environmental products and solutions, especially in waste management and recycling. The expo also brings together industry leaders from around the world to share insights, establishing a comprehensive business platform for environmental protection.

hktdc.com/event/ecoexpoasia/en

ECOMONDO 2024

November 5 – 8, 2024 Rimini (Italy)

Ecomondo is a leading event focused on ecological transition, bringing together industry leaders, policymakers, and stakeholders to discuss and influence European Union environmental policies. As an international event for green and circular economy technologies, it features companies offering environmental services and solutions in sectors such as water management, waste disposal, bioenergy, and sustainable urban development.

Over four days, Ecomondo reviews flagship projects from the Next Generation EU and assesses circular economy practices in Italy and Europe. It emphasizes soil, water, and coastal restoration, and sustainable city development, offering insights into research funding, new policies, and communication strategies while providing high-quality training to support sustainable processes.

en.ecomondo.com

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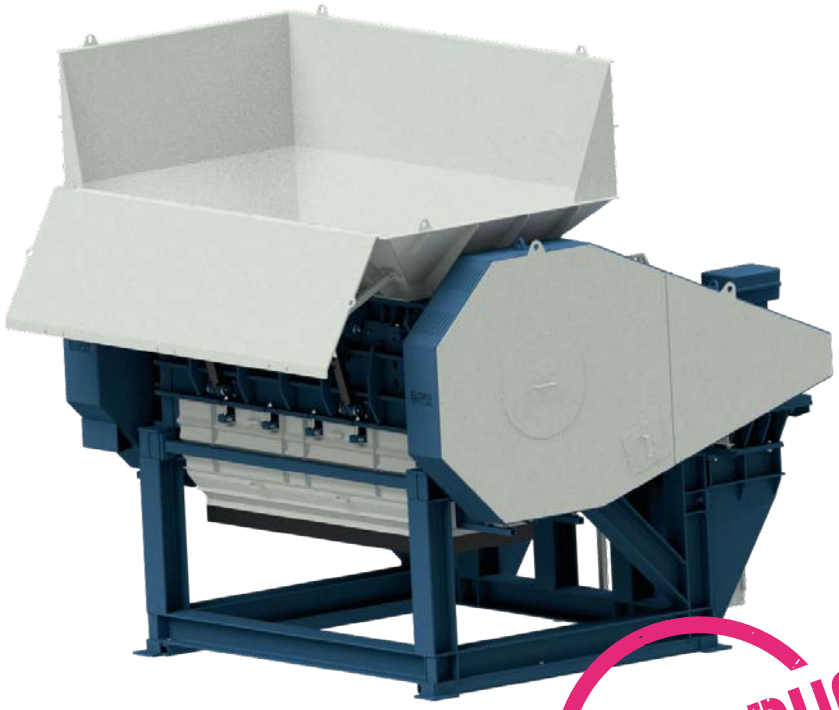

NEW PRODUCT

HEAVY DUTY GRANULATOR (HDG160 / HDG200 / HDG240)

Modified for recycling of tough material, e.g. ASCR cables, Cu scrap & Al cables, low-grade cables with some impurities, non-ferrous metals, industrial waste, etc. The new knife system with rotary knives/knife holders integrated with the rotor makes a solid foundation for resistance towards heavy objects. The knives are straight and can be used on all four sides and easy to grind. The screens are easy for the operator to handle with no need to use a crane. The HDG can be used as a prechopper for cable and the output can be fed straight to granulators.

- Adjustable knife clearance optimizes the cutting function.
- The knives can be reground multiple times on a "flat-bed" grinder ensuring long life and low operation costs.
- Designed for quick and easy change of knives and screens.
- The rotor is manufactured and designed for minimum wear with hard-face welding.
- Screens with different hole sizes are available for flexible production.
- Five pieces of screens per set and inter-changeable depending on wear.
- Exchangeable wear parts give you a virtually indestructible machine.
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